

STRATEGIC ASSET MANAGEMENT PLAN

This Strategic Asset Management Plan for Facilities and Physical Security provides alignment between the Agency strategy, stakeholder requirements, organizational objectives and resulting asset management objectives to ensure facilities and physical security assets are managed and measured in creating and delivering value.

*For FACILITIES and
PHYSICAL SECURITY*

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1.0 EXECUTIVE SUMMARY

BPA Facilities serves a key role in facilitating the high-reliability of the BPA transmission system and enable the full spectrum of BPA business activities across the Pacific Northwest. This Facilities Strategic Asset Management Plan (SAMP) provides the lifecycle planning and execution strategies to enhance staff safety and security, strengthen resource stewardship, and maximize the value of facilities assets while minimizing risk. The SAMP provides clear alignment with the BPA Strategic Plan, organizational objectives, business requirements and the resulting asset management objectives ensure that Facilities assets are managed and measured to create and deliver value to BPA.

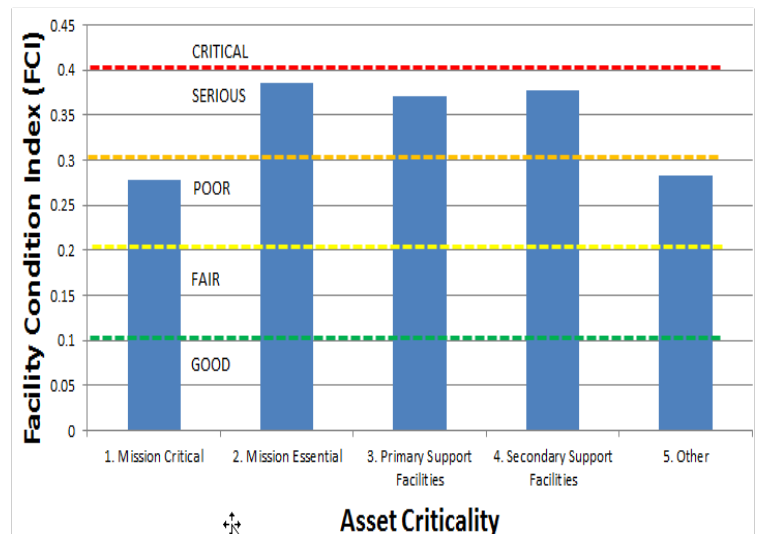
Facilities manages an estimated \$1.3B of facilities assets comprised of control centers, control houses, radios stations, warehouses and administrative offices. The majority of facilities serve Transmission Services, but they also propel all facet of BPA business, including Power Services and the full range of corporate and administrative services, like Environment, Fish and Wildlife, Compliance and Finance. BPA will provide safe and secure facilities that are a key to enabling BPA business lines to continue to deliver value to the Pacific Northwest.

Facilities asset management competencies improved in four of the seven key roles of the Institute of Asset Management (IAM) Competency Framework to an average maturity of 1.7 on a scale of 0 to 4. Notable improvements in Strategy and Planning can be seen in the holistic planning and transparency of portfolio actions, while improvements in the Life Cycle Delivery are seen in the improved quality and certainty of facility capital acquisitions. A continued focus on safety and security across the Agency and Facilities program sees meaningful investments and repairs that enable BPA operations while reducing risks. Additional strides are being pursued to improve the efficiency of project delivery methods to improve project outcomes and to maximize the use of limited staff and financial resources.

Given the limited BPA funding and resource constraints and the continued degradation of assets due to their age, BPA will focus on sustainment and recapitalization efforts to minimize the operational and safety risks over the next ten years. With 70% of the portfolio in need of elevated levels of maintenance and serious repair or, in many instances, replacement, poor facility portfolio condition represents an increased risk to operations and safety. Management of these risks is central to the strategies and initiatives put forth in the SAMP.

Investment and maintenance will prioritize actions to maintain personnel safety and essential business while minimizing the degradation of essential facilities assets (Asset Criticality level 1, 2, and 3). Sustainment activities will focus on providing preventative maintenance and repair, while recapitalization activities will include the restoration, modernization, or replacement of facilities.

Facilities program development in the areas of asset information, decision making and asset management competencies shape the SAMP strategies to improve on the current state (see Section 8) and to reach the performance standards defined in the program future state (see Section 10). The primary metric to gauge progress and efficacy will be to measure asset condition, or Facility Condition Index (FCI) of the future state. With safety and security as a guiding tenet, BPA will judiciously manage risks while delivering prudent and cost-effective solutions that maximize value.



2.0 ACKNOWLEDGEMENTS

Our mission in the Chief Administrative Office (CAO) is to ensure that Bonneville Power Administration's (BPA) internal services are strategically aligned, that work is clearly prioritized and well executed, and communications are effective. Investments in facilities and delivery of business services are aligned with BPA 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 investment in assets and services in accordance with organizational objectives to support BPA's core business;
- Continuously improve awareness of asset management activities in order to execute day-to-day operations in a cost effective manner; and
- Make risk-informed decisions to maximize the value of our facilities and services while improving safety and environmental stewardship.

I'm extremely proud of the work that our team achieved over the past years to develop our business in accordance with asset management principles. Looking forward, we see that the future brings challenges and opportunities for our organization. We welcome this opportunity to push ourselves and take major steps towards our goal of becoming a valued partner recognized for our operational excellence through improvements in asset management.

A handwritten signature in black ink, consisting of several large, overlapping loops and a long horizontal tail extending to the right.

Robin Furrer
Chief Administrative Officer

2.1 Senior Ownership

The Facilities SAMP is reviewed internally by the Chief Administrative Office (Facilities and Workplace Services and Security and Continuity of Operations) staff as well as Transmission Services (Planning, Operations and Field Services). This document is the culmination of a holistic Agency strategy developed with key stakeholders to define the current and future state of the facilities portfolio, resources and funding required to reach future state goals, and necessary data to inform, maintain and improve the health of the Facilities portfolio. The managers of each contributing stakeholders group reviewed and support the conclusions and recommendations contained in this document.

In order to provide the necessary lifecycle facilities planning, projects and services, this document was developed closely with a multitude of stakeholders, partnering organizations, and subject matter experts (SMEs) to ensure that the strategic approach is vetted, resourced, aligned with Agency goals and objectives, and visible to all stakeholders. Facilities Planning and Projects (NWM) is the leading author of the SAMP with focused contributions and refinements from the key contributors listed below. This is the second iteration of the Facilities SAMP and as such the process to refresh this document focused on the integration of contributors feedback, updates to tracked performance metrics and the resulting impacts to the portfolio health, a renewed focus on risk identification and risk based decision making, and an updated strategy that incorporated lessons learned gained by reviewing the impacts of the last strategy.

2.1.1 Key Contributors

- Director, Facilities and Work Place Services
- Manager, Facilities Planning and Projects
- Manager, Facilities Operations and Maintenance
- Supervisor, Business Operations
- Manager, Transmission Strategy and Program Management
- Operations and Service Managers, Transmission Services
- Manager, Physical Security and Continuity
- Asset Strategist for Finance Capital Investment
- Enterprise Risk Management

2.1.2 Key Activities

- Identify the key high level processes and activities which occurred in the development of the SAMP
- Identify assets
- Identify key stakeholders
- Assess the facilities asset management maturity level
- Develop strategy objectives
- Determine and document asset criticality levels
- Review and document the current health of facilities assets
- Benchmark program performance against industry standards
- Identify risk and risk based decision making process
- Target and document future state performance levels
- Develop strategies to get from current state performance levels to future state performance targets
- Identify challenges and gaps that need to be overcome to achieve optimal performance

3.0 STRATEGIC BUSINESS CONTEXT

3.1 Alignment of SAMP with Agency Strategic Plan

The SAMP outlines achievable strategies which maximize the value of the BPA facility assets while mitigating the safety, reliability, financial, environmental and compliance risks to the program posed by an aged infrastructure and facilities portfolio. This establishes the framework used to align our next ten years of investments and strategies with the four Agency strategic goals: 1) strengthen financial health, 2) modernize assets and system operations, 3) provide competitive Power products and services, and 4) meet Transmission customer needs efficiently and responsively). The guidance defined in the SAMP informs the BPA Facilities Asset Plan (AP) and establishes the specific targeted efforts, resources, and schedules required to support the delivery of the Agency strategic goals and objectives.

The SAMP is focused on three asset management objectives, which are aligned with the BPA Strategic Plan as follows:

- **Asset Management Objective 1: Provide safe, healthy and professional workspace for BPA personnel**
 - *BPA Value: Culture rooted in safety.* Acquisition of new facilities and renovation of existing facilities as they reach their mid lifecycle refresh window ensures BPA staffing centers align with industry technology standards and human performance improvement strategies.
- **Asset Management Objective 2: Enable reliable, efficient and flexible operations of all BPA organizations**
 - *BPA Strategic Goal 1: Strengthen Financial Health.* A) Acquisition of new facilities and the retirement of underutilized facilities reduces high O&M costs and dependency on lease space. Continually promote facility efficiency improvements to reduce operational costs. B) Integrate focused investment strategies which are risk informed, cost effective, realistic, and scalable in order to deliver and maintain facilities in alignment with transmission business requirements.
- **Asset Management Objective 3: Maximize the value of BPA facilities while minimizing risk.**
 - *BPA Strategic Goal 2: Modernize Assets and System Operations.* A) Acquisition of new facilities and renovation of existing facilities as they reach their mid lifecycle refresh window ensures BPA staffing centers align with industry technology standards and human performance improvement strategies. B) Invest first in the facilities assets that have the greatest strategic importance to grid operations and ensuring that they support their mission through resiliency and reliability.

3.2 Scope

BPA Facilities assets play a major role in the O&M of the Bulk Electric System and house all Agency staff and equipment. The asset portfolio covers everything from mission critical control centers to vehicle storage buildings. Assets that are not covered include transmission lines, towers, equipment, personal property, and undeveloped real estate. Leased facilities are not treated as assets but incur a cost which must be considered in the strategy. Facilities program scope items are organized as follows:

BUILDING ASSETS (included)

Facility assets support the operation and maintenance of the Bulk Electric System and consist of approximately 1,000 owned buildings, such as: control centers, control houses, relay houses, microwave radio buildings, maintenance buildings, office buildings, meter houses, storage buildings and oil houses. Assets are prioritized by operational criticality, building type and system type.

To improve facilities coordination across programs, all facilities work supporting building systems and fixed infrastructure, e.g., network cable plant, etc., is included for prioritized execution in this SAMP. Facility security requirements are planned in accordance with the BPA Graded Security Plan.

COMMERCIAL LEASES (included)

Commercially owned and leased facilities assets that support the administration, operation and maintenance of BPA business. Leased facilities primarily support short and longer term administrative staffing and storage requirements.

PHYSICAL SECURITY (included by reference)

BPA’s Graded Security Plan (GSP) projects and NERC-CIP compliance enhancement investments are managed by the BPA Office of Security and Continuity of Operations’ Physical Security Team (NNT). Physical Security and Facilities investments actively coordinate to ensure the consistent application of requirements and standards. Physical Security investments are not included in the Facilities funding figures herein, but are specifically referenced (see Section 13) for FY22 – FY31.

PERSONAL PROPERTY (not included)

Materials, equipment and non-fixed enclosures are specifically excluded in this strategy as they support itinerant or temporary organizational needs on BPA sites.

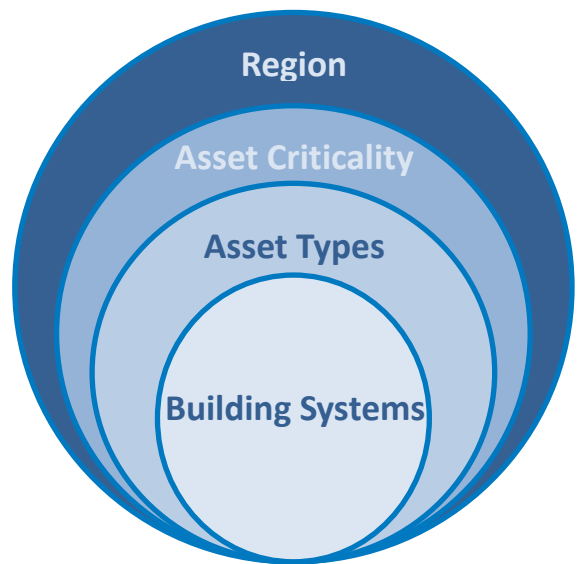
LAND (not included)

BPA undeveloped land assets are specifically excluded in this strategy, as they are within the purview of the Transmission Real Property Services (TER) organization. Facilities actively collaborates with Transmission to inform facilities decisions and facilities asset registry information for approximately 450 sites in the BPA service area.

3.3 Asset Description and Delivered Services

BPA owns and operates 2.8 million square feet of facilities valued at an estimated value of \$1.3 billion, including non-building, site improvement assets, across Oregon, Washington, Idaho, Montana, Wyoming and California. BPA’s facility asset inventory includes 450 sites and approximately 1000 buildings such as control centers, substation control houses, maintenance shops, administrative offices and warehouses. BPA is also responsible for the leasing, operations and management of corporate commercially leased office spaces, which total 885,000 square feet. This includes the delegated lease of the GSA-owned BPA Headquarters building in Portland, Oregon, and various non-building assets at sites such as sewer systems, fences, and roads.

BPA’s facilities and their supporting infrastructure span 300,000 square miles of service area. This service area is divided into three regional operating areas. These three regions (North, East and South) are further divided into thirteen operations and maintenance districts.



Regions and Districts have a spectrum of climates, which often dictate working conditions, tools, and equipment needs. Regions also have varying geographic features, e.g., mountains, desert, coastal, in order to enable timely localized response to for planned and emergent work, as well as facilitate contact with local customers and stakeholders.

Table 3.3-1, Asset Types

CRITICALITY LEVEL	ASSET CLASSIFICATIONS	BUILDING ASSET TYPES		
1	Mission Critical	Control Center Data Center	Converter Station	
2	Mission Essential	Control House Control/Maintenance Relay House Hangar SVC Stations	Microwave Engine Generator Bldgs. Guard Shack Warehouses Corporate Headquarters	
3	Primary Support Facilities	Administration/Office Bldg Maintenance HQ/Shop HMEM		
4	Secondary Support Facilities	Laboratories/Training Facilities Pump House Meter Houses	Storage Building Untanking Tower Fueling Station/Wash Bay	
5	Other	Decommissioned Oil House		

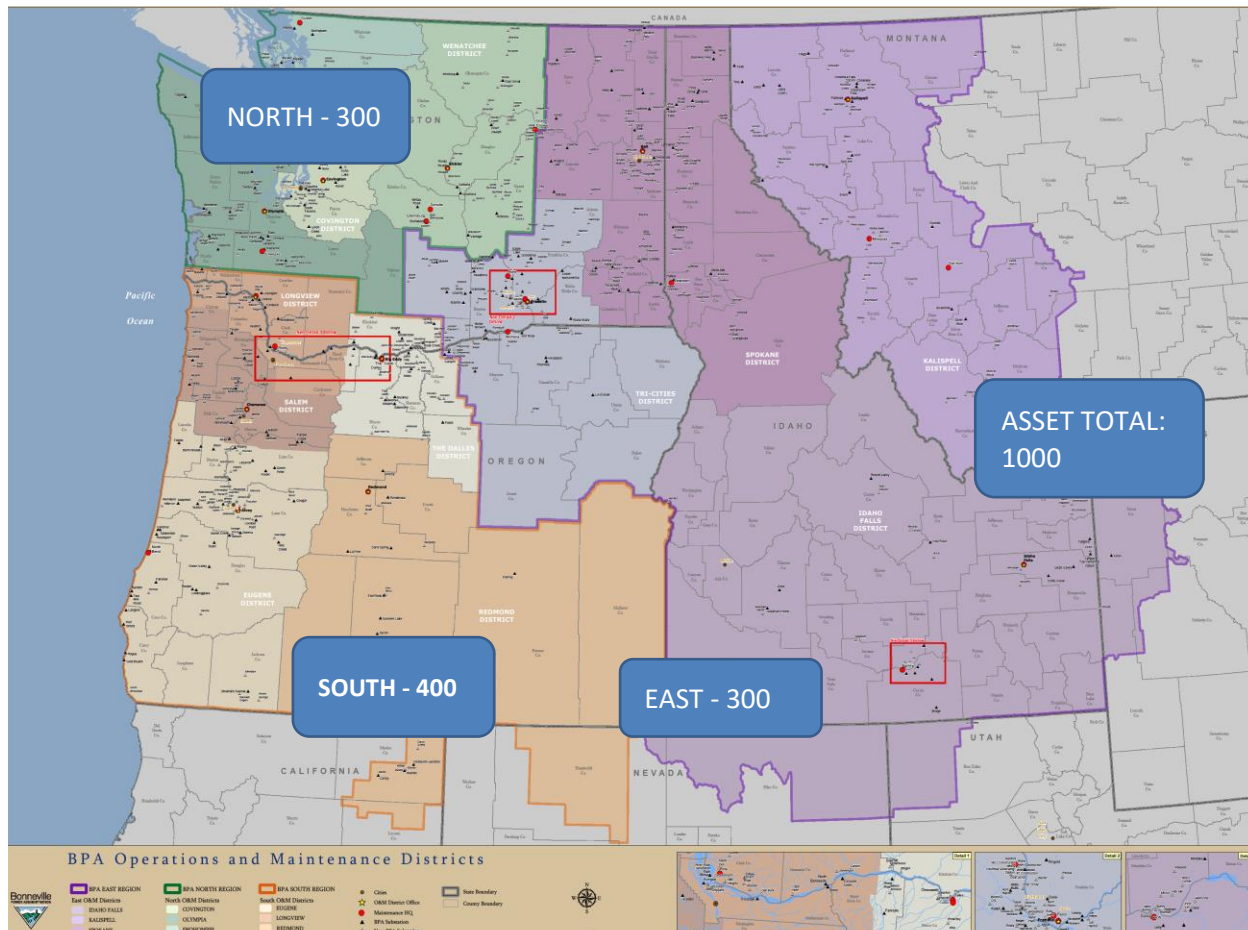


Figure 3.3-1, Asset Location Counts by Region

3.4 Demand Forecast for Services

BPA Facilities support includes planning for asset modernization and optimization as well as O&M services. Demand for facility-related products and services is forecast to remain relatively consistent at the portfolio level over the next 10 years. However, this is not to say that demand for services is static across the Agency. BPA workforce size, staff locations, and transmission business requirements are continually shifting, often with little visibility. For each facility service, corresponding market forces affecting demand include:

1. **Emerging Transmission Business Requirements** (Asset Modernization): Facilities maintains a rolling 10-year plan for lifecycle replacement at Transmission O&M field sites. The internal demand for facility lifecycle replacement is consistent and predictable, however, some facility modernization efforts arise out of Transmission's need to quickly respond to emerging business needs. NERC-CIP compliance and transmission reliability are key objectives within the Transmission business line which may indirectly affect the timing and prioritization of facility modernization efforts.
2. **Workforce Fluctuation** (Asset Optimization): As BPA's workforce expands and contracts, Facilities must provide office space flexibility while also ensuring effective cost management of facility space. Past staffing fluctuations have varied by as much as 10% within one decade with little visibility towards future trends. This is particularly true of Portland/Vancouver office space which relies heavily on leased space but is also expensive to maintain. A highly strategic approach is required as lease terms are typically set in 10 year terms. Target staffing levels adopted by the Agency as well as deviations from those levels are both factors that significantly influence the strategic approach to the Facilities office space strategy. Facilities anticipates that future changes to staffing distribution in the Portland/Vancouver metro area will
3. **Asset Condition** (O&M Services): The BPA facility asset base has remained relatively stable in the last 20 years but the condition of assets is poor across most building systems. As many of these systems age, Facilities will be placing greater and greater resources towards maintaining end of life assets. The amount of resources and rate of increase are based on the reliability curves of the individual system components and are fairly predictable across the portfolio. O&M is not influenced by external market forces.

3.5 Strategy Duration

The analysis conducted in this SAMP covers a 10-year planning period. This strategy will be updated and reviewed every two years to align with the approved Integrated Program Review (IPR). As part of the planning process, the following assumptions are made:

- Each iteration of the SAMP will focus on closing information gaps from the prior version.
- Strategies to improve facility asset performance will be refined based on trackable performance metrics.
- Identified funding and resource gaps will be addressed as appropriate based on the Agency investment prioritization.

4.0 STAKEHOLDERS

4.1 Asset Owner and Operators

The majority of BPA facilities support Transmission Services operations at field sites. Through most of BPA’s history, the planning and maintenance was the responsibility of Transmission Services. In 2009, the BPA Facilities program began with the responsibility for funding the renewal, replacement and retirement of these facility assets. While daily O&M actions are performed by Transmission Field Services District staff, the funding for maintenance, repair and renewal is the responsibility of BPA Facilities. Corporate Facilities staff manage Headquarters, Ross Complex and Munro Control Center.

In addition to owned assets, BPA operates and maintains a number of lease sites in Portland, Vancouver, Seattle and some field sites. These leases represent over 60% of the total Facilities Operations (NWF) expense budget and are operated and maintained by Facilities Corporate staff.

4.2 Stakeholders and Expectations

BPA Facilities’ stakeholders are identified as anybody directly, or indirectly impacted by the program. During project planning and work plan development, stakeholders are identified and consulted. Our primary stakeholders are the BPA organizations with shared responsibility and/or approval authority for operational and compliance requirements, e.g., tenants (Regional Managers/District Managers/staff), functional work groups, Program Managers, Subject Matter Experts from compliance and service organizations (Environmental, Cultural Resources, Safety, Security, and IT).

Table 4.2-1, Stakeholders

Stakeholders	Expectations	Current Data Sources	Measures
Customers	Low Rates	Long Term Rates Forecasting Tool, Focus 2028	Rate Forecasts, Long-Term Planning
	Reliability	Asset registry database	NFPA 110
	Quality	Asset registry database	Facility Condition Index (FCI)
BPA	Safety	Industry regulations and standards	Incident report records, documentation of non-compliance, facility safety actions
	Flexible Operations	ProjectWise Land Information System	Usable Square Feet Continuity or Operations Plans
	Competitive Costs	Financial system	Audited financial reports
	Reliability	Reliability database, SCADA, GIS	Fault statistics
	Accountability	Key performance indicators Business cases	Annual staff and performance reviews Business case targets
	Compliance	Resolver	Legal and statutory compliance for A-123
	Environment Trustworthy Stewardship	Industry regulations and standards (NEPA) Financial system Utility tracking system	Environmental Assessments Pollution Abatement Clearances Energy/Water Use Intensity (EUI/WUI) Green House Gas (GHG) Emissions
	Cultural Resource Stewardship Risk Exposure	Industry regulations and standards (NEPA) Risk analysis models in business cases	SHPO Programmatic Agreements and Memoranda of Agreement Risk ranking
NERC/WECC	Regulation Compliance	Resolver	Internal/External Auditing, RSIPP Decision Documentation, Self-Reports
Staff	Health and Safety	Safety database	Incident statistics
	Job Security and Satisfaction	Administrative database	Staff survey results, turnover figures
	Training	Administrative database	Agreed professional development
	Safety	Industry regulations and standards	Safety Metrics (Lost Time Accident Rates, Days Away Restricted or Transferred, Total Case Incident Rate)
Public	Safety	Public safety management system	Non-conformance records
	Land Access Rights	Land Information System (LIS)	Complaints

5.0 EXTERNAL AND INTERNAL INFLUENCES

Effective sustainment of facility assets is largely tied to BPA Facilities ability to conduct business according to the market demands of the regional construction industry. This implies having the technical competence to keep pace with the evolution of building codes, building technology and best practices. To an equally large extent, it also includes keeping pace with the proliferation of newer project delivery methods and the quickly rising costs of facility lease space.

The design-bid-build delivery model that BPA has traditionally utilized for project delivery has been supplanted by a multitude of competing options. The ability to develop projects according to newer industry preferred methods has a profound impact on the execution rate, price and quality of facility work commissioned by the Agency. BPA Facilities is working with its partnering execution groups to develop alternative project delivery methods and improve staff competencies in order to implement new contract vehicles for engaging with the design and construction industry.

BPA Facilities’ budget is expected to remain flat for the foreseeable future while employee overhead, construction and lease costs are steadily escalating. The challenge is experienced across BPA’s five state territory but is most acute within the greater Portland Metro area. Per discussions with GSA, lease costs in Portland are increasing over 40% between 2018 and 2023. The additional resources needed to meet a higher cost of business in the Portland metro area effectively diverts financial resources needed for sustainment and modernization of facility assets. In order to mitigate these cost pressures, BPA Facilities will develop a multifaceted set of strategies to that can be implemented independently and flexibly according to market conditions and opportunity.

Table 5.0-1, External and Internal Influences

External Influences	Affects and Actions
Technology: Modern facilities are more complex with integrated technology and energy efficiencies systems.	Workforce design, construction and O&M competencies need to keep pace with the implementation of technology. This requires an investment in our people to keep them competent.
Market conditions (Construction): Current construction market constraints due to an abundance of commercial/residential sector work	Higher bid prices on construction and major renovation project limits the amount of work that can be performed with a fixed budget. Shared funding across IPR windows would allow funding gaps in lean years to be applied to times of increased market pressure.
Market conditions (Leasing): Commercial leasing market constraints in the Portland/Vancouver metropolitan area	Higher demand and constrained market in the Portland and Seattle areas will drive up lease costs (including GSA Occupancy Agreement costs) for our office portfolio. This impacts the expense portion of asset costs.
Climate change	Climate change may potentially impact facilities in several key areas. Design temperatures may not reflect actual seasonal temperatures. HVAC and other building systems may work beyond normal parameters and lead to early system replacement needs. Assets may be located in newly identified flood/inundation/wildfire zones that alter facility risk profiles. Storm water systems may be undersized for conditions.
Regulatory compliance requirements	Emerging requirements to meet security, safety and other mission requirements typically have short implementation timelines and will shift fiscal and manpower resources from other key facilities projects. Storm water management and infrastructure requirements are emerging and difficult to forecast, which in turn are difficult to budget.

Table 5.0-1, External and Internal Influences cont.

Internal Influences	Affects and Actions
Aging asset portfolio may not meet modern codes	Asset resources may be adaptively reused and organizations may be relocated with minimal notice to address emerging safety, security, and operational needs. This presents challenges in midterm planning for project execution and potential compromise to safety.
Short-term approach to staffing strategy	Unpredictable staffing levels, especially with contractors, forces very reactive planning and make it difficult to identify long term office needs. This makes it a challenge to optimizing the leased / owned mix in office assets. Short term staffing strategies also result in unpredictable reorganizations that require restacks, moves, and resources. The Workforce KSI should help to resolve some of these issues.
Increased O&M role	Transmission has traditionally shared the cost of managing and executing facility O&M activities, however BPA Facilities plans to take a leadership role in the near term. If facility O&M shifts to a more centralized model for planning, funding and executing work, a greater resource commitment by BPA Facilities will also be required.
Construction and project delivery methods	BPA’s procurement regulations and delivery methods are challenged to keep pace with the private sector. This puts BPA at a disadvantage in today’s constrained construction market.
Staffing constraints (number and skills, competitiveness of labor)	Contracting and project management staffing are limited for facility assets and represent a bottleneck for execution of the Facility Asset Plan.
Contracting processes	Availability and use of standardized project delivery methods, tools, and templates are lacking and inconsistent. Individual CO knowledge and practices also vary considerably, impacting the amount of work and rework needed for contract development.
Funding Allocations	Resource tradeoffs are frequently made between addressing urgent and necessary break/fix O&M actions and planned renewal and replacement of facility assets. The lack of adequate funding for facility O&M diverts human and fiscal resources away from lifecycle planning and renewal and ultimately perpetuates a reactionary approach to asset management.

5.1 SWOT Analysis

Table 5.1-1: SWOT

<i>Favorable</i>	<i>Unfavorable</i>
<p data-bbox="120 386 797 424"><i>Strengths</i></p> <ul data-bbox="131 430 786 1003" style="list-style-type: none"> • Driven workforce with diverse skillsets and high level of employee engagement • Ability to effectively and consistently integrate strategic planning, resource management and cost forecasting • Mature asset registry that is comprehensive and updated on a 5-year refresh schedule and as part of project closeouts • Newly adopted codes via the new AHJ council support a culture of performing work and conducting asset management lifecycle activities with safety in mind • Aligned Asset Management Plan and Strategic Asset Management Plan • Emerging understanding of alternative project delivery methods 	<p data-bbox="797 386 1502 424"><i>Weaknesses</i></p> <ul data-bbox="812 430 1485 1003" style="list-style-type: none"> • Consistent adherence to industry standard cost estimation methods • Consistent practice and transparency of risk-based decision making • Consistent mapping and management of project execution timelines • Significant administrative burden of running planning and project management under one department unit impairs effective time management • Clarity and understanding of roles and responsibilities when organizations share lifecycle phase responsibilities • Lack of consistent system lifecycle cost analysis • Support and standardization of alternative project delivery methods
<p data-bbox="120 1100 797 1138"><i>Opportunities</i></p> <ul data-bbox="131 1144 786 1570" style="list-style-type: none"> • Implementation of Computer Maintenance Management System (CMMS) will introduce greater visibility to asset performance and trends • Maturation of service level standards will allow for more efficient procurement process and improve project pricing and quality of delivered assets • Potential to improve project quality, cost and delivery times through adoption of alternative project delivery methods including, progressive design-build and CM/GC. • Integration of energy delivery facility full lifecycle under the workplace services group 	<p data-bbox="797 1100 1502 1138"><i>Threats</i></p> <ul data-bbox="812 1144 1485 1717" style="list-style-type: none"> • Escalating operating costs (lease, salary) are forecast to consume a growing portion of project expense funding. • Unplanned/tactical O&M actions routinely consume staff time and organizational budget detracting from strategic goals. • Staff retention across project teams can negatively impact project continuity • Competing project information and process management systems between different business lines introduce complexity to project teams • Multiple business line ownership of facilities assets prevents consistent delivery, results, and tracking of investment into energy delivery facilities

6.0 ASSET MANAGEMENT CAPABILITIES AND SYSTEM

The current state of BPA Facilities asset management capabilities and systems is continuing to mature over time with an improvement in overall maturity level from 1.6 in 2018 to 1.7 as of this writing. The program assessment is conducted by the Facilities Planning and Projects supervisor and program managers. In the time since the initial publishing of the facilities SAMP there have been improvements in Strategy and Planning and Asset Information while the remaining categories remain essentially unchanged.

6.1 Current Maturity Level

Asset Management Capabilities and Systems average a maturity level of 1.7 across all subject groups in the Institute of Asset Management (IAM) Asset Management Maturity model. The lack of a mature Facilities operations and management function, integrated with asset creation, renewal, replacement and retirement often limits efforts to mature the facilities asset management system. The result is a reactive-centered facilities program that addresses short-term needs rather than the execution of strategic choices.

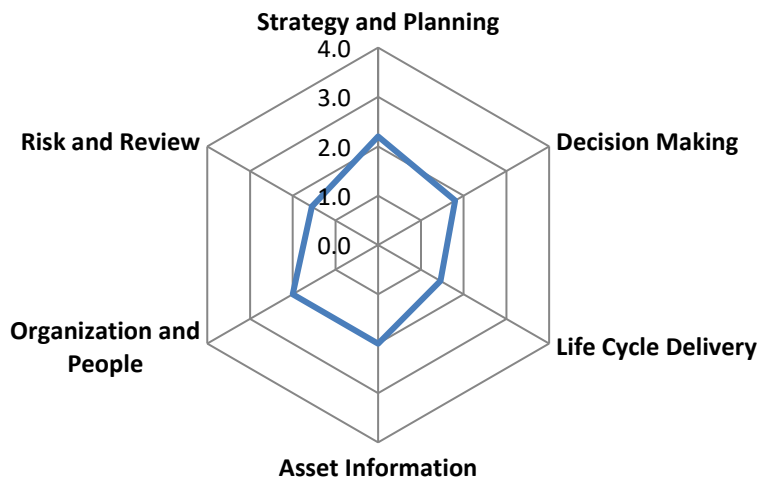


Figure 6.1-1 Maturity Level

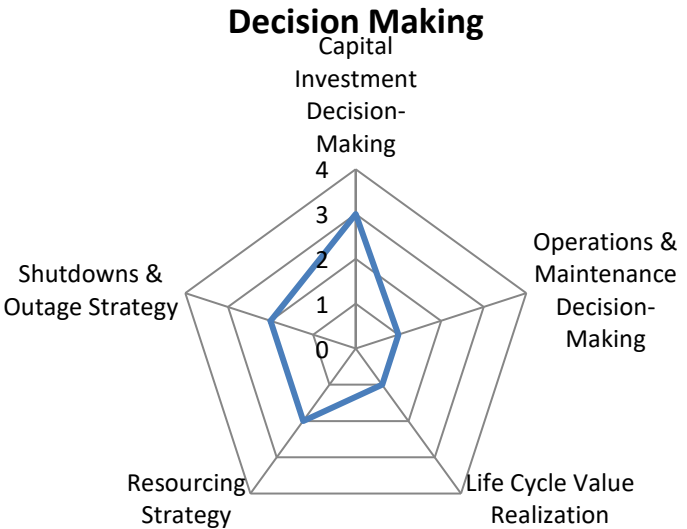
Table 6.1-1 Maturity Level

Subject Area	Maturity Level												
<p>Strategy & Planning</p>	<p>Strengths: Holistic planning of major properties is well integrated with budget forecasting and annual workplans. Major BPA properties have well developed, flexible investment plans that serve to inform resource requirements and sequencing needed to attain the targeted asset health goals for its portfolio. BPA Facilities can respond to changes to its long-term project forecast with agility while understanding the downstream impacts to project sequencing and fiscal spend.</p> <p>Weaknesses: Planning is often aspirational without more robust execution capabilities. Improvement with respect to interagency coordination, more consistent project scheduling and more predictable procurement timelines is needed to enhance the fidelity of strategic plans.</p> <div data-bbox="760 848 1425 1381" style="text-align: center;"> <p>Strategy and Planning</p> <p>The radar chart displays five categories: Asset Management Policy, Asset Management Strategy & Objectives, Demand Analysis, Strategic Planning, and Asset Management Planning. Each category is measured on a scale from 0 to 4. The current maturity level for all categories is 2, represented by a blue line connecting the data points.</p> <table border="1"> <caption>Strategy and Planning Maturity Data</caption> <thead> <tr> <th>Category</th> <th>Maturity Level</th> </tr> </thead> <tbody> <tr> <td>Asset Management Policy</td> <td>2</td> </tr> <tr> <td>Asset Management Strategy & Objectives</td> <td>2</td> </tr> <tr> <td>Demand Analysis</td> <td>2</td> </tr> <tr> <td>Strategic Planning</td> <td>2</td> </tr> <tr> <td>Asset Management Planning</td> <td>2</td> </tr> </tbody> </table> </div>	Category	Maturity Level	Asset Management Policy	2	Asset Management Strategy & Objectives	2	Demand Analysis	2	Strategic Planning	2	Asset Management Planning	2
Category	Maturity Level												
Asset Management Policy	2												
Asset Management Strategy & Objectives	2												
Demand Analysis	2												
Strategic Planning	2												
Asset Management Planning	2												

Decision Making

Strengths:
 Capital process is robust with checks and balances. Investments put forward are given advanced visibility within the Facilities Asset Plan, preliminarily scoped and vetted through the CAO office prior to inclusion.

- Weaknesses:**
- (1) O&M decisions are split between business lines with often competing priorities. Occupant stakeholders in the field are typically more focused on tactical O&M-related issues, often more reactionary than programmatic. BPA Facilities is more often focused on the longer term impacts of facility investment. While both are important to fulfilling BPA’s mission objectives, the tension between short-term and long-term needs dilutes the focus of overall intention of the decision making.
 - (2) Consistent and transparent risk-based prioritization and decision making.
 - (3) Lifecycle cost analysis of system and material selection remain inconsistent.



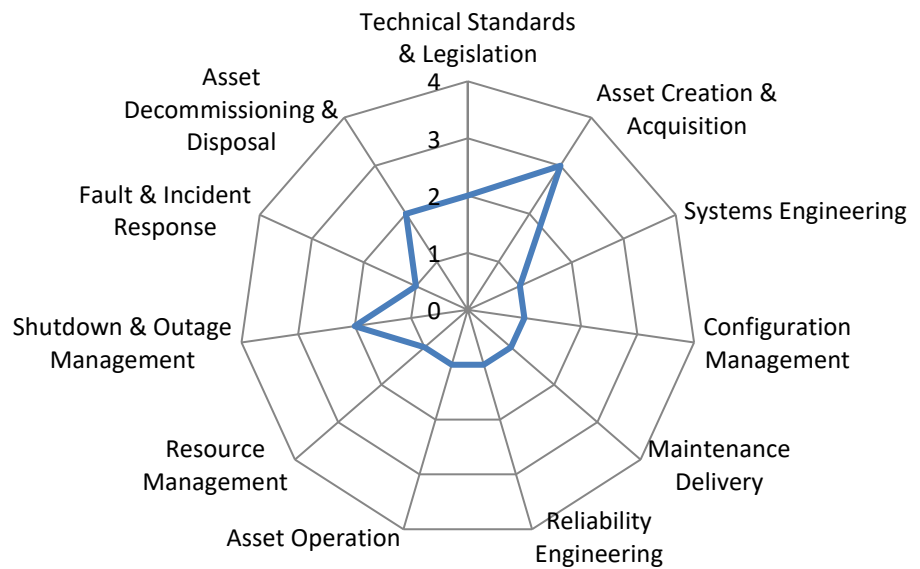
Lifecycle Delivery

Strengths:
 Facilities has made solid strides over the last 5 years ensuring that project requirements are adequately defined and followed through asset delivery by rigorous quality management plans. This is an ongoing process and there is still room for improvement but standardization of the scoping/programming phase, implementation of change control processes, and quality management plans have given the program positive momentum which is reflected in the recent performance of facility capital projects.

Weaknesses:

The lack of a centralized authority for facility O&M activities impairs standardization and consistency across the portfolio. Different regions and districts within BPA have different approaches to O&M. These approaches are yet different the Ross Complex which is maintained by BPA Facilities. Increased pressure on available expense funding due to increases in lease holding and O&M will hinder the ability to invest in mid lifecycle renovations on schedule resulting in less than ideal asset lifespans.

Life Cycle Delivery



Asset Information

Strengths:

- (1) The asset registry is comprehensive and refreshed on a 5-year cycle. Condition index can be sorted according to building system, asset and campus levels enabling a more programmatic approach for maintaining and replacing assets.
- (2) Recently, the asset registry has been tied into RS Means, the largest construction estimating database in the United States. This leverages the asset registry to enable relatively quick and complete cost estimates generated to the system level.

Weaknesses:

- (1) Process improvement is needed with respect to synchronizing the asset registry with asset creation. At present, the process for entering new asset information (and all system components) at project completion is manual which requires a lengthy paper trail. This leads to inconsistent and sometimes, incomplete data entry. An opportunity exists to automate this process through the project management database.

(2) There are not well established metrics for measuring the effectiveness of facility program management. Although the data exists to define “success” in project execution and program management, the informatics required to organize the data across multiple data sources has not been built out.

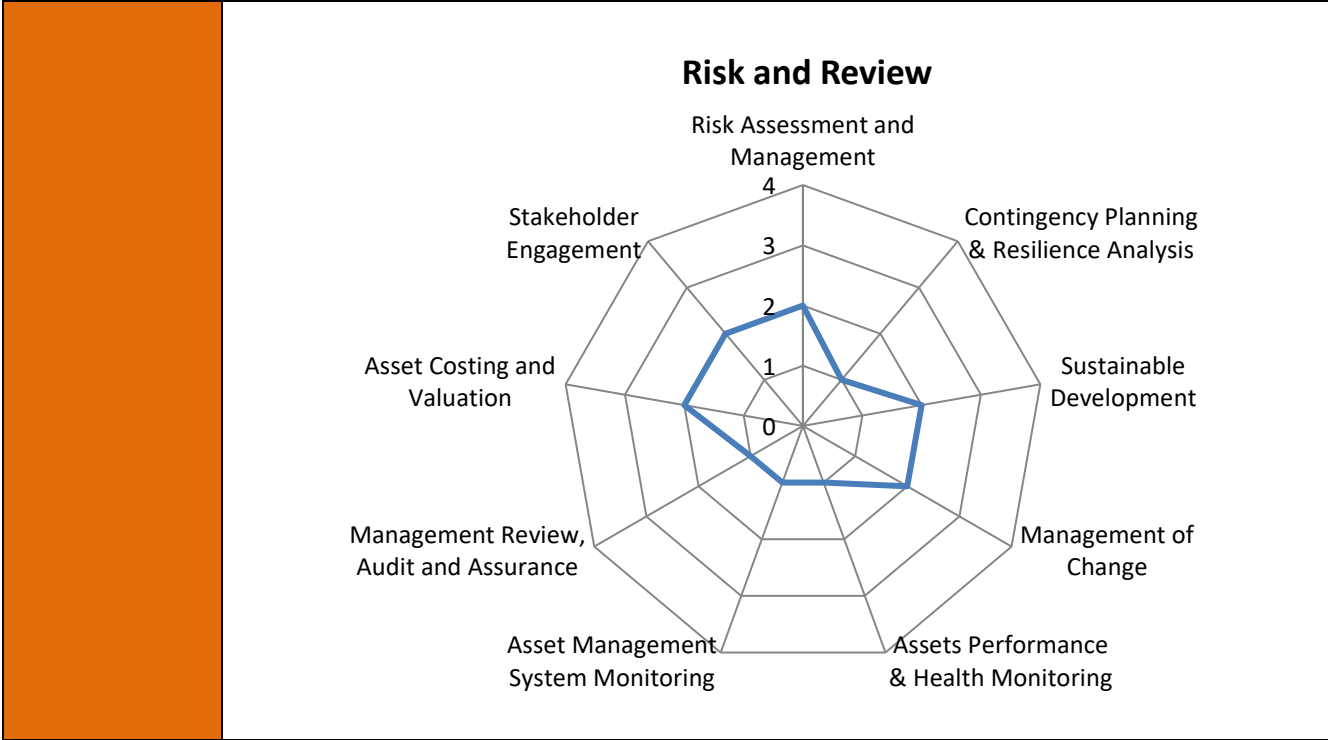
Organization & People

Strengths:
 BPA Facilities staff has a diverse range of skillsets and high level of engagement. The productivity of staff has remained consistently high.

Weaknesses:

- (1) Procurement lacks consistency in processes, tools, and personnel knowledge. A considerable amount of project time and resources are spent in the procurement phase with many additional projects being deferred due to a lack of readily available support.
- (2) Facility projects are executed in partnership with Supply Chain Services and Transmission Engineering. The partnering orgs reside in geographically different locations and facility work represents only a small portion of their workload. This introduces challenges to both workflow, communication and culture. Synchronizing the projects ready for execution with the availability of staffing resources is an ongoing challenge.
- (3) Staff retention has remained a consistent issue as PgM turnover limits the ability to hold gained ground on strategies and prioritization. This churn slows the maturation of the program and diverts focus from high priority planning issues.

	<p style="text-align: center;">Organization and People</p>
<p>Risk & Review</p>	<p>Strengths: Stakeholder engagement, particularly with field facilities, is robust. Although priorities are not always in alignment, discussions on how best to use resources are regularly held and there is mutual acknowledgement of each party’s needs.</p> <p>Weaknesses: Process improvement is needed with respect to consistent and transparent risk-based decision making. Given the limited fiscal and human resources for facility assets, it is imperative that investment decisions prioritize high criticality projects over other competing priorities. The traceability behind prioritization of these decisions, however is not always recorded in an auditable format.</p>



6.2 Long Term Objectives

The long term objective of BPA Facilities is to achieve asset maturity level 3 (competent) in all key roles and competencies by or before the fifth update to the SAMP (2026). In order to meet the primary long term objective, focus must be placed on the individual objectives defined below in the areas of information management, program standardization, and resourcing. Together, action on these items will improve the areas that currently are the most immature. Data tracking will help inform risk and decision making by making. Standardization will help improve decision making and streamline routine O&M, thereby reducing costs. Resourcing at the right level will help to improve the lifecycle delivery of the portfolio by increasing the throughput of strategic initiatives.

OBJECTIVE 1: IMPROVE ASSET MANAGEMENT INFORMATION

Advance Standardization & Integration of Information Management Tools: An important area of ongoing development is implementation of standardized tools supporting asset management processes. By further integrating the various systems already necessary for operations we will be able to make more informed infrastructure decisions on behalf of the BPA. A paramount advantage of standardization is the ability to track and manipulate data sets across multiple platforms to identify trends and make more informed decisions. As data tracking matures in facilities with the integration of a PgMIS (Program Management Information System) more opportunities to improve and communicate the state of optimal asset management will emerge.

At present, BPA Facilities uses a manual process to publish internal monthly district newsletters, quarterly newsletters, and an annual report that tracks the completion of projects, emerging challenges, and areas of future focus. Additionally, the integration of FCI score changes will bring more visibility to the long term trends of the conditions of our asset portfolios. To facilitate the above, the following areas of focus will drive future initiatives supporting improved data management capabilities:

Table 6.2-1 Performance Goals

Measure	Year	Goal
Report Automation	2020 – Implementation 2024 – Full Functionality	Automate reporting of standardized facilities asset, maintenance and budget status reports for broad dissemination within the BPA. Ability to track by asset health and cost performance by project and portfolio with sorting by District, Region, Portfolio or execution bundle.
Asset Information Governance and Data Stewardship	2020 – Initiate 2021 – Full Functionality	Establish Data Stewardship Council in order to clarify system ownership, asset values and use required for asset reporting and prioritization.
O&M Informatics Integration	2019 – Data Organization 2020 – Acquire Software 2022 – Full Functionality	Integrate Computerized Maintenance Management System (CMMS) with Facility Operations workflow for improved project management capabilities and enterprise level functionality for integration of reports, parts tracking, labor costs, and work order generation.

OBJECTIVE 2: IMPROVE ASSET MANAGEMENT DECISION MAKING

A robust set of programmatic standards will support more consistent decision making that carries over through changes to staffing and management while streamlining the project delivery process.

Advance Program Standards for Design, Maintenance and Materials/Equipment

- **Design Standards**
 It has been noted in professional literature that 80% of one’s ability to positively affect Operations and Maintenance are determined by the decisions made during the design and construction. The more standardized the portfolio is, the more economies of scale can be leveraged in spare parts, technical training, specialized tools, preventive and corrective maintenance tasks etc. This fact suggests that there should be a tight relationship between desired service levels and the decisions made during the design/construction phase.
- **Maintenance Standards:**
 Clear and objective service standards will drive the selection and implementation of industry best maintenance practices for the various assets/systems/components within the Facilities portfolio. Execution of such by qualified personnel; documented in a CMMS, will not only result in better asset reliability, performance and lower lifecycle cost of ownership, but the historical data compiled will also inform improvements to design, service and maintenance standards in the future.
- **Materials/Equipment Standards**
 The existence of system components within the built environment that serve the same function(s) but are of differing sources/design/manufacture, adds unnecessary overhead and cost for spare parts, training, specialized tools, etc.

Table 6.2-2 Performance Design Goals

Measure	Year	Goal
Adopt Baseline Codes for Facilities	2019 – Implementation 2020 – Vet Process 2021 – Full Functionality	Establish baseline codes applicable to all facility projects in order to improve building safety and consistency of design across BPA facility portfolio. Baseline codes to include ICC, NFPA, IAPMO and IEEE family of codes.
Service Level Maintenance Standards	2021 – Implementation 2024 – Full Functionality	Develop comprehensive service level standards for major building systems with the Integrated Facility Management (IFM) contract implementation. Metrics to track delivery, cost and efficacy. Adjudicated by committee and updated on a bi-annual cycle.
Performance Specifications for Major Facility Categories	2023 – Implementation 2025 – Full Functionality	Establish performance specs for major facility categories. Create standardized basis of design for facility categories and define performance characteristics of installed system components.

OBJECTIVE 3: IMPROVE ASSET MANAGEMENT COMPETENCIES

Expand Alternative Project Delivery Methods

In order to deliver the comprehensive, cradle to grave, asset management program currently being developed; more resources will be required; especially in the areas of addressing the Backlog of Maintenance and Repair (BMAR) and day to day O&M. Given the current political and fiscal realities, it is nearly certain that the majority of these resources will be contractors and/or *contracted* services. As such, several high-level and complimentary actions will be assessed as an adjunct or replacement to general service contracts:

Action 1: Limited regional master contracts for specific maintenance and/or services.

Action 2: Integrated Facilities Maintenance contract for base O&M using standardized service level models.

Action 3: Performance Based Contracts (PBC) based on outcomes as opposed to methods, processes, and systems.

Table 6.2-3 Project Delivery Method/Goals

Measure	Year	Goal
Expand Project Delivery Methods	2020 – Establish model 2021 – Implementation (Portland-Vancouver) 2022 – Implementation (Field)	In partnership with Supply Chain, broaden range of project delivery methods to allow for responsive and resource efficient means for executing O&M and small construction contracts. Contract vehicles will assist with implementation of service level standards and have the capacity to be executed BPA-wide.
Expand Project Delivery Resource Methods	2020 – Establish model 2021 – Implementation (Portland-Vancouver) 2022 – Implementation (Field)	Develop alternative project delivery methods that enable cost-effective and efficient use of financial and staff resources as an alternative path to Transmission delivered projects.

Staff Competencies

As reported in the BPA Asset Management Enterprise Process Improvement Plan (EPIP), the Facilities Planning and Projects group was formed in 2006 and is responsible for the planning and oversight of BPA facilities. Much progress has been made across the BPA in developing asset management skills and capacity. However, the personnel performing building operations and maintenance, energy management, sustainability, water efficiency, safety (including electrical safety), building performance measures and design functions across the Agency come from many professions including engineers, architects, and facilities specialists.

Table 6.2-4 Staff Competency Goals

Measure	Year	Goal
Define Competency Requirements and Provide Development Opportunities	2020 – Establish role capabilities 2021 – Implementation (Portland-Vancouver)	Develop a generalized standard of practices and competencies for facility asset management practitioners in accordance with a competency framework set forth in the Federal Buildings Personnel Training Act (FBPTA) of 2010. Specific monitoring and support will be given in the areas of succession management, knowledge management and skills development, change management and communication.

6.3 Current Strategies and Initiatives

OBJECTIVE 1: IMPROVE ASSET MANAGEMENT INFORMATION

Initiative 1

Integrate facilities projects into the TAPM (Transmission Asset Portfolio Management): Improve transparency and enable better coordination of resources. This integration will provide visibility into plan portfolio activities across all asset categories to yield a more complete picture of emerging investments and better align resource management between Facilities and Transmission. This initiative is in-flight and expected to complete in FY20.

Initiative 2

PgMIS System Improvements: *Facilitate*, the Facilities project management platform is an ongoing initiative and will be receiving a significant update in the first half of FY20. The improvements will target data tracking and report generation, earned value analysis and forecasting, improved budgeting and scheduling capabilities and generation of risk profiles at the asset and portfolio levels. The initiative is part of a larger effort to improve BPA Facilities informatics capabilities in the areas of data tracking, data standardization and increased reporting automation.

OBJECTIVE 2: IMPROVE ASSET MANAGEMENT DECISION MAKING

Initiative 3

Establish Authority Having Jurisdiction (AHJ) Council: An important step towards greater standardization of the Facilities program is the adoption of a building code governance program which will apply a common family of codes applicable to all BPA facility and building infrastructure assets. In 2019, BPA Facilities formally established an AHJ governance policy and decision making body to provide oversight and guidance for the approval and tracking of code compliance, equivalencies and variances. Implementation is ongoing as BPA Facilities receives project level feedback. With the establishment of the AHJ policy, BPA adopted the International Code Council building codes (ICC) and National Fire Protection Association (NFPA) standards. Additionally, GSA's P100 Design Standards will be used to guide administrative office requirements to the Agency's unique requirements.

OBJECTIVE 3: IMPROVE ASSET MANAGEMENT COMPETENCIES

Initiative 4

Integrated Facility Management (IFM) Contract Implementation: As part of an effort to expand contracting tools for O&M actions and small construction projects, BPA Facilities, in partnership with BPA Supply Chain, is soliciting vendors for an IFM contract, which seeks to simplify the procurement process, reduce the administrative cost, and alleviate project management resource constraints. Contract award is expected between FY20-21.

Additionally, as part of the IFM contract, Facilities will develop comprehensive service level standards for all facility assets. Implementation of maintenance standards is expected to begin in FY21 for assets maintained by BPA Facilities. Upon successful implementation, O&M standards will be rolled out to the field starting FY22.

7.0 ASSET CRITICALITY

7.1 Criteria

Facility assets within the operational areas of the Facilities portfolio are grouped into five asset classifications relative to their asset criticality. “Criticality” in this sense pertains the assets importance in supporting or maintaining the bulk electric system:

- **Mission Critical:** Control centers and data centers having a direct impact on Bulk Electric System operations or outage in the event of failure.
- **Mission Essential:** Control houses, radio stations, associated facilities and backup power systems that provide for operation of substations.
- **Primary Support Facilities:** Facilities and structures that support day-to-day operations and maintenance of the Bulk Electric System.
- **Secondary Support Facilities:** Facilities and structures that support activities for routine operations and maintenance activities, training, research and infrastructure.
- **Other:** Facilities and structures mostly underutilized.


Generally, the following risk factors are considered when determining the criticality of an asset:

- **Safety/Security:** Ability to provide a safe and secure workplace in support of operational requirements.
- **Reliability:** Ability to provide for continuous grid operations.
- **Financial:** Ability to provide facilities that meet operational requirements at the best value.
- **Environmental:** Ability to provide stewardship of the environment and protection natural resources.
- **Compliance:** Ability to meet regulatory requirements, standards and guidance.

Assessing these risk factors is accomplished through the use of system impact analyses in coordination with Transmission, Continuity of Operations, and Physical Security. In addition, Program Managers coordinate with internal business line peers in to ascertain changes in asset criticality due to the addition of equipment in buildings, changes in grid architecture, and additional system loads.

Table 7.1-1: Asset Building Type Criticality

ASSET CRITICALITY	ASSET CLASSIFICATIONS	ASSET BUILDING TYPE	
1	Mission Critical	Control Center Data Center	Converter Station
2	Mission Essential	Control / Relay House Control & Maintenance SVC Stations Hangar	Microwave / Eng.Gen. Guardhouse Warehouses HQ Building
3	Primary Support Facilities	Administrative Office Maintenance HQ/Shop	Garage (HMEM)
4	Secondary Support Facilities	Laboratories / Training Meter / Pump Houses	Storage / Untanking Fueling / Wash Bay
5	Other	Oil House	Decommissioned



Criticality ranking of an asset is driven by such factors as the asset’s impact to Transmission system reliability, the extent that another facility can perform the same function, as well as threat potential. This priority translates into a criticality score at the project level for rating and ranking for proposed work when adding to the rolling work plan; more critical facilities and building systems rank higher than those that are less critical. The resulting project list contains an overall work plan priority showing the highest (1) to lowest priority.

In addition to assessing building assets, the components that comprise buildings (known as building systems) also are analyzed to determine relative criticality. Components in the Facilities asset category coincide, for the most part, with building systems. Systems are organized via the *Uniformat-II* industry standard which allows for the decomposition of building systems from level 1 to more specificity in level 4. A building asset is created via a conglomeration of integrated systems. Systems, in the same manner as assets, are also prioritized based upon their criticality.

Table 7.1-2, Building System Types & Criticality

CATEGORY		SYSTEM TYPE							
		A. SUBSTRUCTURE	B. SHELL	C. INTERIORS	D. SERVICES	E. EQUIPMENT & FURNISHINGS	F. SPECIAL CONSTR & DEMO	G. BUILDING SITEWORK	Z. GENERAL
SYSTEM CRITICALITY	1		B20: Ext. Enclosure B30: Roofing		D30: HVAC D40: Fire Protection D50: Electrical			G20: Site Improve G30: Site Mech Utility G40: Site Elec Utility	
	2		B10: Super Structure	C20: Stairs	D10: Conveying D20: Plumbing				
	3					E10: Equipment			Z10: General (Feasibility Study)
	4	A10: Foundations A20: Basement					F10: Special Construction	G90: Other Site Construction	
	5			C10: Int. Construction C30: Int. Finishes		E20: Furnishings	F20: Selective Building Demo	G10: Site Preparation	

Table 7.1-3, Major Component Types and Characteristics

Component Type (Uniformat Level 1)	Component Type (Uniformat Level 2)	Life Expectancy	Operation & Maintenance Standards
A SUBSTRUCTURE	A10 Foundations	Life of Building	Run to failure
	A20 Basement Construction	Life of Building	Run to failure
B SHELL	B10 Superstructure	Life of Building	Run to failure
	B20 Exterior Enclosure	20	Run to failure
	B30 Roofing	20	Run to failure
C INTERIORS	C10 Interior Construction	25	Run to failure
	C20 Stairs	Life of Building	Run to failure
	C30 Interior Finishes	20	Run to failure
D SERVICES	D10 Conveying	40	Varies by service contract
	D20 Plumbing	50	Run to failure
	D30 HVAC	15	Varies by service contract
	D40 Fire Protection	15	Varies by service contract
	D50 Electrical	Life of Building	Run to failure
E EQUIPMENT & FURNISHINGS	E10 Equipment	Life of Building	Run to failure
	E20 Furnishings	10	Run to failure
F SPECIAL CONSTRUCTION & DEMOLITION	F10 Special Construction	Life of Building	Run to failure
	F20 Selective Building Demolition	Life of Building	Run to failure
G SITEWORK	G Sitework – Building Related	Life of Building	Run to failure
	G Other Sitework – Project Related	Life of Building	Run to failure

7.2 Usage of Criticality Model

The criticality model is a framework for identifying risks (see Section 9) and prioritizing available budget and resources. The model is a quality check against our work plan to ensure that we are doing the right work at the right time for the right reason in line with Agency strategies and more granular objectives at the asset category level.

In light of risks defined and explained in Section 9, an overall work plan priority is created annually for all project requests. The Facilities Asset Program Manager manually creates an overall asset priority which is the result of both the asset criticality model as well as input from stakeholders, current situational awareness, and balancing feasibility of project success (see Section 9).

8.0 CURRENT STATE

8.1 Historical Costs

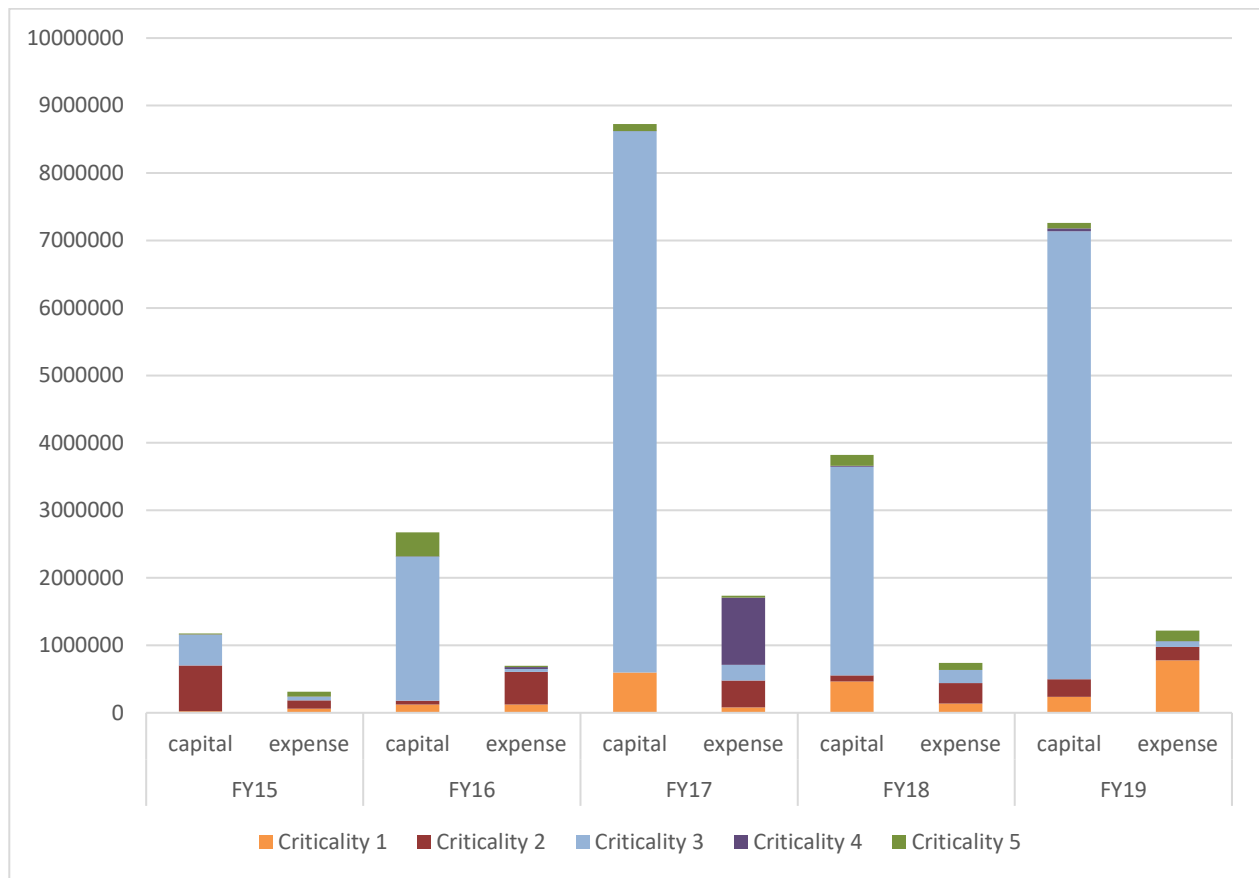


Figure 8.1-1, Historical Spend by Asset Criticality

Spending Priorities:

BPA Facilities seeks to balance planned improvements (capital replacement and major expense upgrades) with more tactical/urgent O&M actions required to maintain site operability and minimum standards for a professional work environment. The need to balance long term and immediate actions with limited resources defines the shape of the facilities spending. Urgent O&M makes up the majority of the facilities expense program leaving little opportunity for major expense upgrades. For capital work, the facilities program only executes on average one major project every two years. Accordingly, near-term annual historical data will provide only a snapshot of several major projects under development. However, there are several consistent themes to note which shape the facilities historical spend profile:

- The Maintenance Headquarters Program (*Criticality Level 3*) is Facilities largest asset-specific replacement program and has historically accounted for the majority of capital expenditures in a typical year. Over a long-term time horizon, this is expected to remain an enduring priority and will be reflected in consistent capital spending on Criticality Level 3 assets. Spending priorities will change as Facilities begins work on the future Vancouver Control Center (*Criticality Level 1*), however, this is temporary and over longer time frames (20 years +), the emphasis will remain on the MHQ Program.

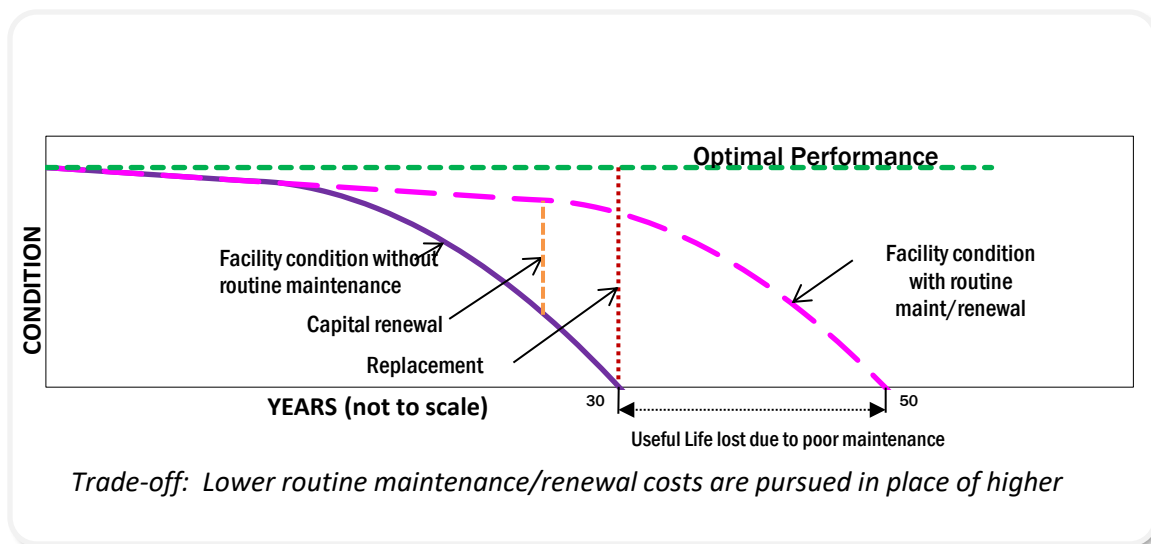
- *Criticality Level 2 & 3* assets which include control houses, administrative office, shop, and transmission warehousing represent the large majority of by BPA’s facility portfolio by area and number. At least 50 % of expense spending on average will remain focused on maintaining the operability of these assets due to their area and number.
- Capital replacement of control houses (*Criticality Level 2*) are funded and executed by Transmission Services. BPA Facilities is responsible for the maintenance of these assets which is reflected in *Figure 8.1-1*. Because replacement is funded by a separate business line, Criticality Level 2 assets are not fully represented when looking at total facility cost data for the BPA.

8.2 Asset Condition and Trends

The average age of the facilities portfolio is 42 years old and in need of additional resources towards maintenance and replacement. The backlog of maintenance and repairs (BMAR) has grown to over \$266M which represents a poor Facility Condition Index (FCI) of 0.38. Over time the FCI score will continue to decline at the current level of investment. The poor portfolio FCI represents an increased risk to grid reliability and personnel safety. Furthermore, facility degradation is a risk to the loss of expected operational and economic benefits due to premature system failure and increased maintenance expenses.

Without increased investment in facilities and building systems, older facilities will generate higher levels of unplanned break/fix O&M actions, siphoning resources away from more effective planned maintenance and replacement. Additionally, BPA Facilities is challenged to address a large number of premature assets/systems failures due to deferred routine maintenance.

Table 8.2-1, Routine Maintenance and Capital Renewal



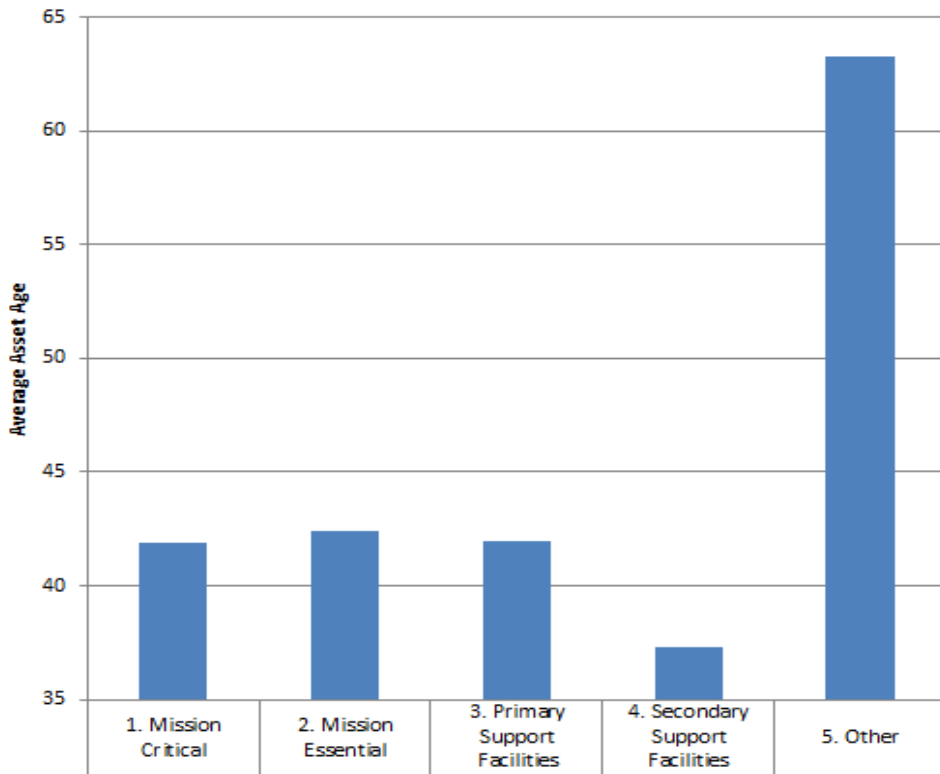
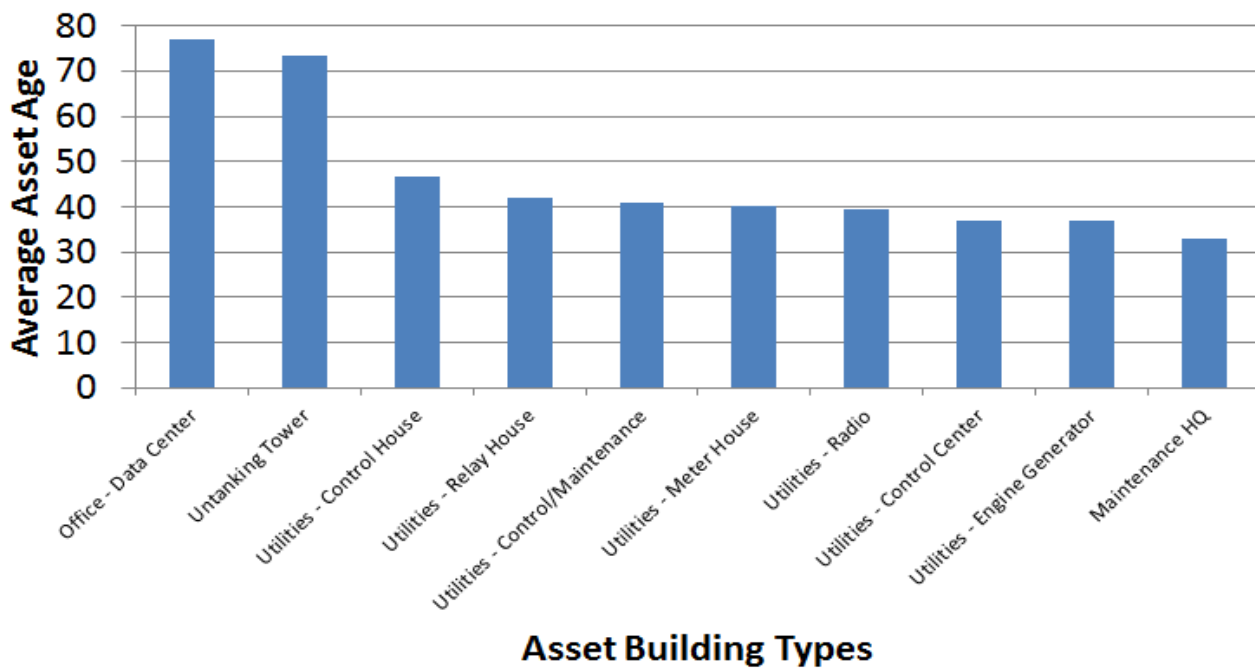


Figure 8.2-1, Current Asset Age by Criticality



Asset Building Types
Figure 8.2-2, Asset Age by Asset Type

8.3 Asset Performance

BPA Facilities established performance measurements and objectives for critical facilities but has not extended those criteria for the remainder of field assets. Efforts to define performance criteria are ongoing as part of a larger initiative to improve our informatics platform and asset reporting capabilities. There are number of ways organizations measure facility asset health, performance, and program effectiveness, however, many industry benchmarks for asset health have limited relevance to BPA’s business environment. BPA Facilities proposes performance metrics that focus on three key objectives: critical facilities reliability, cost management and environmental stewardship.

Table 8.3-1, Asset Performance Measure

Strategic Goal	Objective	Measure	Units	Year – 5	Year – 4	Year – 3	Year – 2	Year – 1
Maintain acceptable critical facilities system uptime	Building System Reliability	% uptime and # of asset failures for MEP systems	% / #	N/A	N/A	N/A	N/A	N/A
Optimize O&M and Lifecycle Planning	Financial	% unplanned work to total work performed	%	N/A	N/A	N/A	N/A	N/A
Maximize Asset Utilization	Financial	Building utilization as a % of capacity	%	N/A	N/A	N/A	N/A	N/A
Reduce Utility Consumption	Environmental	Resource use benchmarking to industry	\$ / #	N/A	N/A	N/A	N/A	N/A

Given the large geographic footprint and distributed responsibility of managing facilities, there are some challenges instituting consistent performance metrics. These challenges do not prohibit formation of performance metrics but they will influence the scope and implementation:

- **Resources:** In order to develop standards and effectively monitor the performance of assets, significant resources need to be committed to annual review of the portfolio. While the existing staff is equipped to track asset performance, there are no additional financial resources to perform this task and integrate it with O&M standards.
- **Location:** Assets performance needs to be evaluated relative to the conditions under which it operates. The climate and operational requirements play an important part in determining the useful life of the asset. For example, enclosure systems of the same specification will have different lifespans based on where they are installed. Similarly, HVAC units will have different lifespans and O&M requirements based on their configuration and climate conditions. This is true for a wide range of building systems.
- **Access to Data:** Until the early 2010’s, BPA has traditionally metered utilities at the site level. Most buildings are still not metered at the asset level and therefore, data for resource consumption has a number of gaps. A metering program has been established and is in progress for water and electrical but it will take a number of years until fully implemented.

- **Consistency:** Facility occupants may manage facilities to different performance expectations. Because O&M for BPA facilities is a distributed responsibility, a uniform method for evaluating performance metrics must be agreed upon and adopted. This is being addressed as part of the Integrated Facility Management (IFM) contract implementation, which seeks to centralize O&M

8.4 Performance and Practices Benchmarking

Benchmarking of BPA’s facility portfolio is measured against industry accepted standards. The benchmarking categories are chosen to align with the BPA Facilities SAMP objectives outlined in Section 3.

Facility Condition Index (FCI):

Facility Condition Index (FCI) is an accepted industry metric for determining the condition of assets relative to their replacement cost. In addition to other performance metrics such as the Asset Priority Index (API), Facility Utilization Index (FUI), and Operations and Maintenance (O&M) costs, it helps asset managers make informed decisions which drive budget and resource prioritization. The intent of this performance metric is to standardize the basic elements for assessment of asset condition, estimate the current replacement value (CRV) of assets, and complete deferred maintenance (OM) work. FCI is defined as the ratio of the total cost of repairs over the total replacement value:

$$FCI = \frac{\text{Maintenance, Repair, and Replacement Deficiencies of the Facility}}{\text{Current Replacement Value (CRV) of the Facility}}$$

The Facility Condition Index (FCI) scale represents a relative measure of a facility or group of facilities based on FCI:

- “Good” Condition 0.0 -≤.1 (Some minor repairs needed; functions okay)
- “Fair” Condition 0.1 -≤.2 (More minor repairs required; mostly functional)
- “Poor” Condition 0.2 -≤.3 (Significant repairs required; system not fully functional for use)
- “Serious” Condition 0.3-≤.4 (Widespread significant repairs needed; approaching full replacement)
- “Critical” Condition 0.4+ (Major repair/replacement required to restore function; system unsafe)

Table 8.4-1, Facilities Condition Index

Assets/Systems	Current FCI	Current Performance
Criticality 1	.28	Poor
Criticality 2	.39	Serious
Criticality 3	.37	Serious
Criticality 4	.38	Serious
Criticality 5	.28	Poor

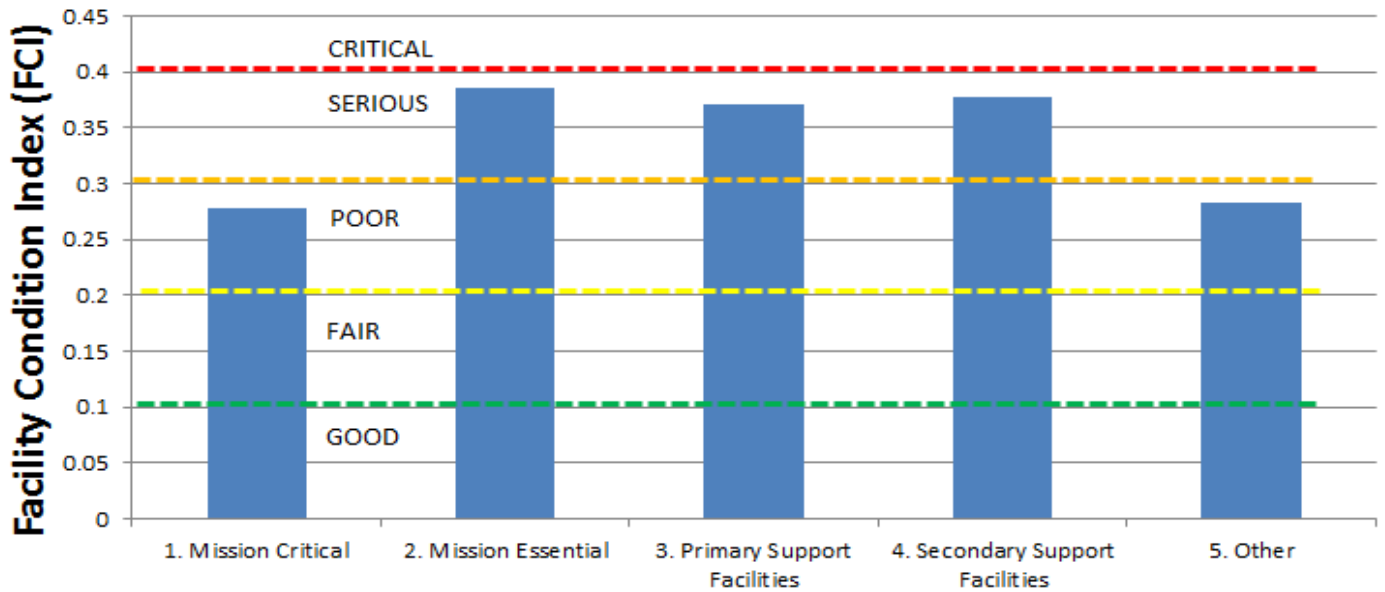


Figure 8.4-1, FCI by Asset Criticality Level

Performance Measurement:

- *Facility Condition Index: FCI scores for BPA facility assets as an average score across each asset category. Currently all categories are in poor condition based on the assessed average score.*

Financial: Facility Utilization

Trending data shows an average 4.25% growth in staffing over the last 5 years, reflecting BPA’s recent system expansion. Current forecasts predict this growth rate will start to turn the corner and FTE staff will be reduced over the next 5-10 years as the BPA looks to find ways to limit overhead costs. It is anticipated that cost effective staffing solutions will result in an optimized combination of leased space and BPA owned facilities, determined in large part by initial cost, expected long term benefits and retained space flexibility, capable of accommodating evolving economic climates.

The Retirement/Decommission of underutilized and obsolete facilities is a key component of “cradle to grave” asset optimization. The BPA Facilities portfolio is heavily weighted towards facilities 30 years and older with a significant number exceeding 50 years of operation. Many of these facilities are approaching functional obsolescence, end-of-life (EUL) status due to seismic or life safety concerns or EUL due to deferred maintenance exceeding replacement costs.

Performance Measurements:

- *Efficiency of Asset Type 3 Facilities #1: Percentage of facility office space utilization.*
Presently this data exists for HQ, Ross Complex, and Van Mall. In the future, field sites will be captured to gain a comprehensive view of BPA space management with the goal of balancing the need to maintain flexibility with the cost of owning/managing
- *Efficiency of Asset Type 3 Facilities #2: Percentage of assets in need of retirement.*
Approximately 1% (48,866 square feet) of BPA facility inventory has been identified as being underutilized or in need of retirement. Efforts to catalog additional assets which need to be retired are ongoing.

Life Safety: Code Compliance and HAZMAT Abatement

One of the core objectives of the BPA is to provide a safe and productive work environment for staff. This initiative started with a comprehensive site survey of real plant property and the site at each priority pathways location (the most critical field sites for BPA operations). Each site was evaluated to determine if there is sufficient physical evidence, including lifecycle cost analysis, to warrant replacement of the building system or if repair is recommended. These evaluations along with the VFA data containing in the asset registry are used as a basis for evaluating and addressing deferred maintenance and future renewal costs in addition to addressing the following challenges:

- **Building Codes:** Many aged BPA facilities were constructed prior to the advent of modern life safety, fire protection and seismic event codes. In many cases, this represents an unacceptable risk to personnel, assets and to BPA operations. While existing buildings are not mandated to comply with modern codes unless they undergo a major renovation, BPA is challenged to address the priority of these concerns in the context of risk-to-value and cost-to-benefit analyses. The first step in this process will focus on addressing the fire and life safety system deficiencies at existing facilities.
- **Hazardous Materials:** Asbestos, lead, mercury and polychlorinated biphenyls (PCB) are just a few of the known or suspected hazardous materials that may exist in BPA facilities and represent potential hazards to personnel. Abatement of hazardous materials often adds significant cost and time to routine repairs and may limit the extent of repairs.
- **Arc Flash:** To comply with NFPA 70E: *Standard for Electrical Safety in BPA Facilities* to reduce the risk of arc flash hazards to protect workers, Facilities continues to perform arc flash studies and providing labeling to electrical equipment in non-energized facilities.

Performance Measurements:

- *Life Safety #1A: Number of fire and life safety system upgrades completed each year:*
Currently there are projects in place to address fire detection, alarming, and suppression systems at several field sites and the Dittmer Control Center. Two sites were completed in FY19. Three are planned to be completed in FY20.
- *Life Safety #1B: Number of fire and life safety assessments completed each year:*
Fifteen additional sites are identified for future assessment

This work will be guided by the recently completed BPA Policy 440-75, Building Code Governance Program.

Dwell Time: Establish Lead Times for Project Process Groups

The facility project delivery process has distinct phases which need to be managed efficiently to ensure that budget and schedule forecasts are met and that stakeholders are expeditiously served. The forthcoming implementation of the updated Facilities project management database will enable tracking of projects by phase or “process group”. This will enable more effective resource management and ultimately, more reliable delivery of assets.

BPA Facilities will begin setting maximum dwell time (phase duration) measures and then benchmarking program delivery performance according to those measures.

Performance Measurements:

- *Dwell Time: Number of business days spent in each project delivery phase*
Track project performance according to the following process groups: (1) project initiation, (2) scoping, (3) procurement, (4) activation, and (5) closeout

9.0 RISK ASSESSMENT

Asset risk management is a disciplined approach towards anticipating and avoiding events which have the potential to adversely affect program goals and strategic objectives. For consistency, five categories of risk have been identified and are analyzed in each asset program. Strategies to reach future state objectives are assessed against each risk category in order to create an optimum strategy that mitigates risk (see Section 10).

As our understanding of risk exposure changes from improved asset data, the categories of risk exposure are aligned with consistent Agency risk methodologies. Currently, risk evaluation is more complete and understood at each project.

- **Risks:** These are defined in accordance with the current Agency risk assessment categories to quantify their impact on operations if they are realized.
 - **Safety:** Risks related to events that include acts of nature (fire, flood, storms, and earthquakes), accidents, theft, vandalism, terrorism, compliance with life safety codes, OSHA requirements, and building codes.
 - **Reliability:** Risks that lead to the break-downs in the operations of people, processes, and/or systems due to facility failures and create potential for failure of utility controlled generation, transmission, or operations.
 - **Financial:** Risks that have adverse effect on the execution of program initiatives in alignment with planned spending levels and escalating operations and maintenance costs due to facilities condition.
 - **Environmental:** Risks associated with adverse effects to local and regional environments caused by facility planning, design, construction, and O&M.
 - **Compliance:** Risk related to regulatory changes, lapses in compliance with, and noncompliance with regulatory and security requirements.

Five risk domains were assessed using the criticality model (Section 7) and asset registry facility condition data. Asset condition data from the asset registry (VFA) informs the health of systems within each asset. The FCI score is merely a compilation of System Condition Index scores (SCI), which are developed during facility condition assessments performed on a five year review cycle. The previous assessment took place in 2017 with the next planned for FY 2022.

Each building system was analyzed as to how its failure would contribute to each of the five risk areas for that system. For example, the “stairs” building system is included in the analysis for safety as aged stairs can be a safety concern due to slips, trips, and falls. Similarly, a site improvement building system is pertinent to environmental risks. This method allows analysis of building systems shown below in Table 9.0-1, where the criticality is assigned a corresponding impact. For example, failure of a criticality level 1 building system corresponds to an impact deemed “extreme,” whereas a criticality level 5 building system failure corresponds to an “insignificant” impact. The likelihood of failure of each building system corresponds to the facility condition assessment bands found above in Table 8.1-1 with a “good” condition equating to “rare” likelihood of failure and a “critical” condition being considered an “almost certain” likelihood.

Note that the SCIs developed as part of the condition assessment are based solely on the observed remaining years of life of the building system and generally not specific deficiencies or risks. Asset health data that includes specific deficiencies to be addressed is a current gap, but generally the heat maps below provide areas of focus for each risk category. Each number in the heat maps below represents the number of building systems in the portfolio that are associated with the risk category and have the corresponding likelihood and impact.

To prioritize this identified risk, more analysis is needed. For the following heat maps, it is noted that the problem area is in the four cells in the upper right. This area represents the highest impact and probability of failures and contains the building systems most needing attention. Further analysis shows the top problematic building systems for each risk category in the figures below.

Table 9.0-1, Building System Risk Analysis

		BUILDING SYSTEM TYPES		FAILURE IMPACT	FAILURE LIKELIHOOD
BUILDING SYSTEM CRITICALITY	1	Ext Enclosure Roofing HVAC Site Improvement	Fire Protection Electrical Site Elec Utility Site Mech Utility	Extreme	Tied to Building System Condition Index (SCI)
	2	Super Structure Stairs	Plumbing Conveying	Major	‘Good’ SCI 0.0-0.1 ~ Rare
	3	Equipment Feasibility Study	General	Moderate	‘Fair’ SCI +0.1-0.2 ~ Unlikely
	4	Foundations Basement Special Construct.	Other Site Construction	Minor	‘Poor’ SCI +0.2-0.3 ~ Possible ‘Serious’ SCI +0.3-0.4 ~ Likely
	5	Int. Construction Int. Finishes Furnishings	Selective Building Demo Site Preparation	Insignificant	‘Critical’ SCI +0.40 ~ Almost Certain

Table 9.0-2, Risk Assessment, Safety
Safety Risk of Building Systems

Likelihood	Almost Certain	2275	5	12	1256	7575
	Likely	0	0	0	3	0
	Possible	0	4	0	0	3
	Unlikely	1	1	0	9	19
	Rare	2177	1664	16	2480	7716
		Insignificant	Minor	Moderate	Major	Extreme
Consequence						

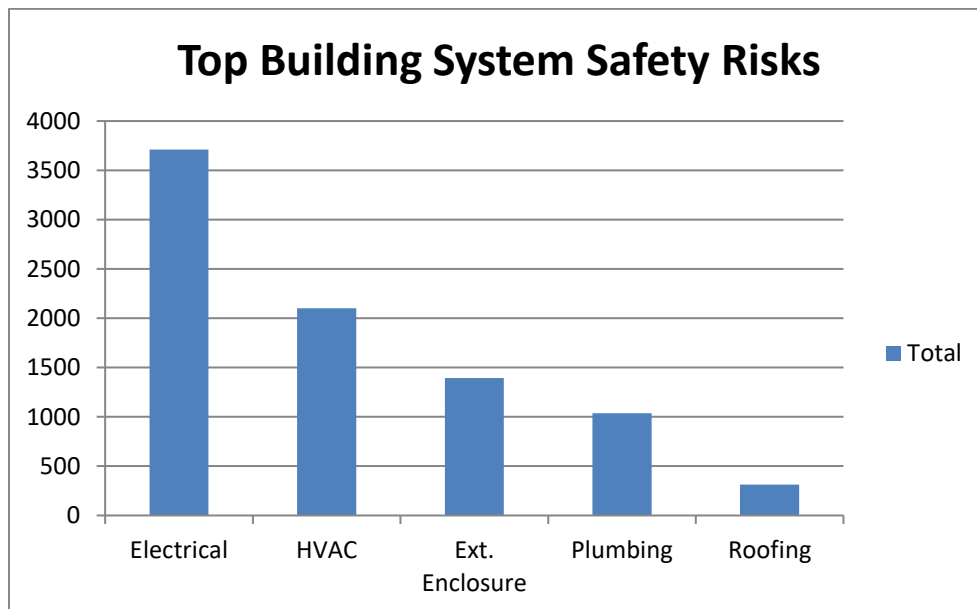


Figure 9.0-1, Top Building System Safety Risks

Table 9.0-3, Risk Assessment, Reliability

Reliability Risk of Building Systems

Likelihood	Almost Certain	0	1	0	1214	8983
	Likely	0	0	0	1	0
	Possible	0	0	0	0	4
	Unlikely	0	0	0	9	19
	Rare	0	0	0	2252	10010
		Insignificant	Minor	Moderate	Major	Extreme
		Consequence				

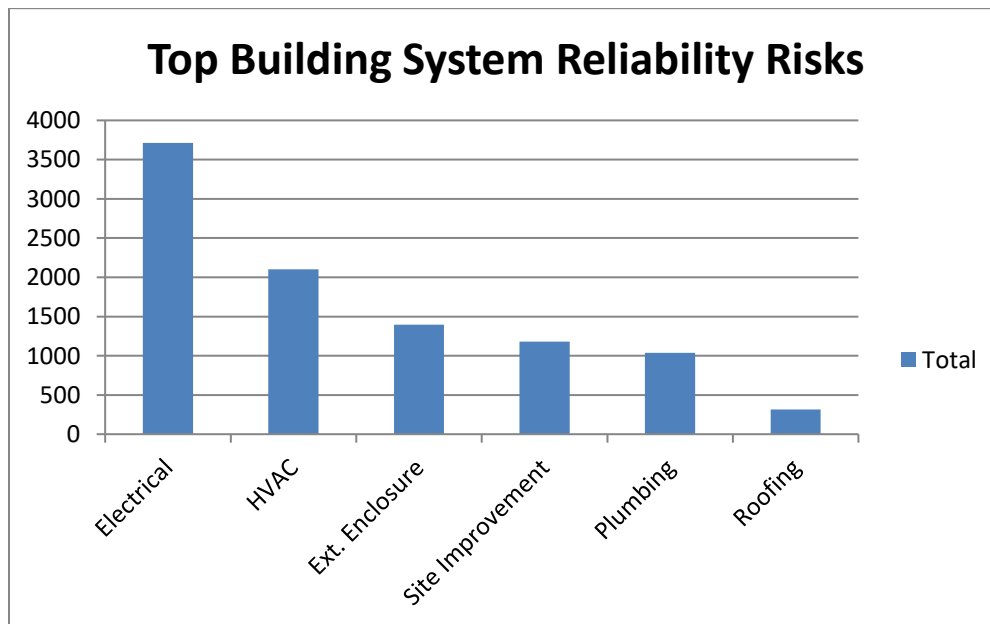


Figure 9.0-2, Top Building System Reliability Risks

Table 9.0-4 Risk Assessment, Financial
Financial Risk of Building Systems

Like lihood	Almost Certain	0	0	0	177	1773
	Likely	0	0	0	0	0
	Possible	0	0	0	0	4
	Unlikely	0	0	0	8	19
	Rare	1	0	0	1265	3198
		Insignificant	Minor	Moderate	Major	Extreme
Consequence						

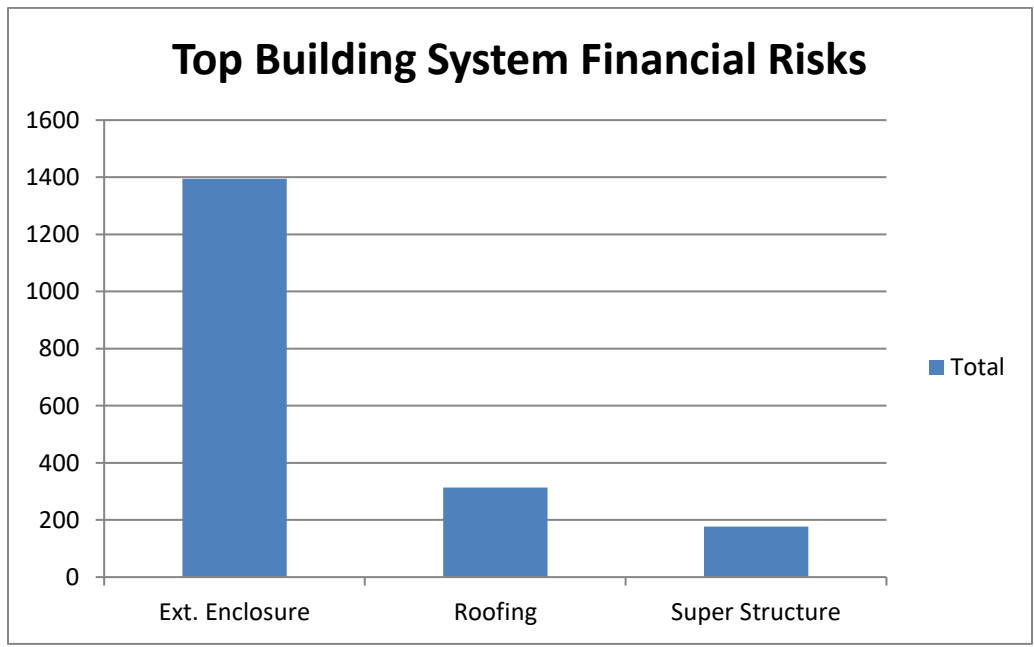


Figure 9.0-3, Top Building System Financial Risks

Table 9.0-5, Risk Assessment, Environment/Trustworthy/Stewardship

Environmental Risk of Building Systems						
Like likelihood	Almost Certain	0	1	0	0	1245
	Likely	0	0	0	0	0
	Possible	0	0	0	0	1
	Unlikely	0	0	0	0	0
	Rare	3	17	0	0	2083
		Insignificant	Minor	Moderate	Major	Extreme
		Consequence				

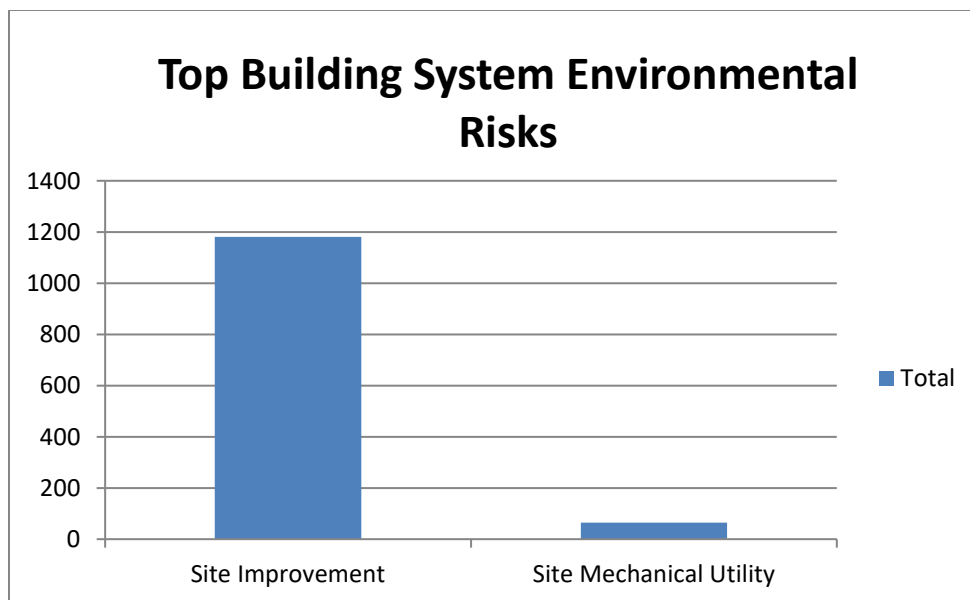


Figure 9.0-4, Top Building System Environmental Risks

Table 9.0-6, Risk Assessment, Compliance

Compliance Risk of Building Systems

Likelihood	Almost Certain	0	1	0	1214	8919
	Likely	0	0	0	1	0
	Possible	0	0	0	0	3
	Unlikely	0	0	0	9	19
	Rare	0	37	0	2522	9639
		Insignificant	Minor	Moderate	Major	Extreme
Consequence						

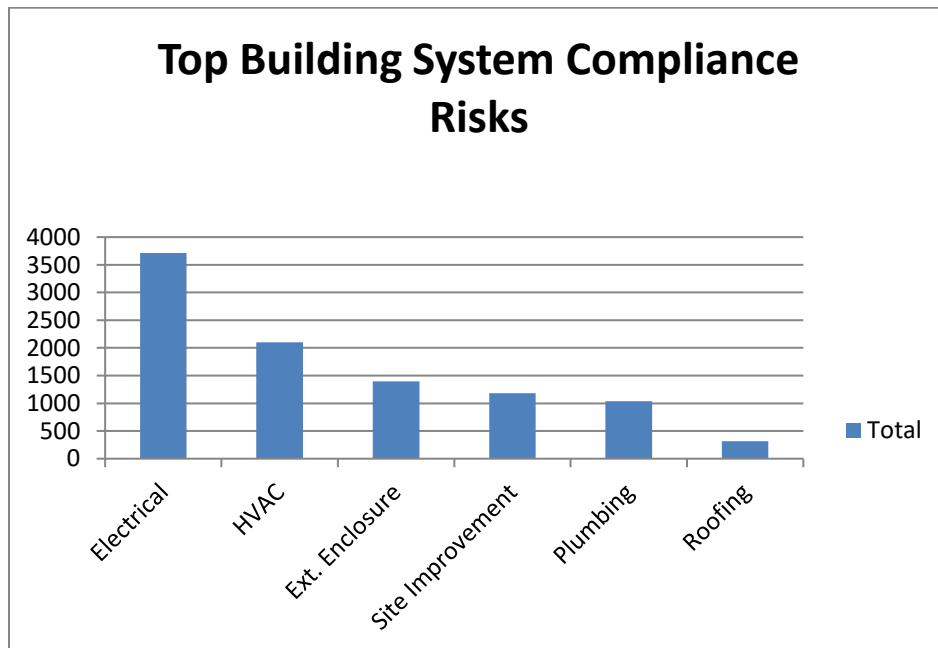


Figure 9.0-5, Top Building System Compliance Risks

Totalling impacted building systems across risk categories gives the following overall totals and priority of risks, in addition, representative projects are included for clarity of what would typically be included in work plans to mitigate risks associate with building system failure.

Table 9.0-7, Prioritized Building System Risks

Building System (Uniformat-II)	No. of Systems Impacted	Priority	Typical Projects and Repairs
Electrical	7422	1	Replacement/upgrade of station service, building panel/wiring upgrades, arc flash studies/labeling, and lighting upgrades
HVAC	4204	2	Addition of redundant HVAC systems, replacement of aged systems, and load studies to verify systems are capable of handling loads
Exterior Enclosure	4185	3	Siding replacements, painting, gutters/drainage, and window replacements
Site Improvement	1181	4	Replacement of septic drain fields, connection to utility service, addition of storm water retention/treatment ponds, or drainage improvements
Roofing	314	5	Repair/ replacement of roofing systems
Super Structure	177	6	Repair replacement of exterior concrete, stairs, ladders, or pre-fabricated buildings. Seismic upgrade of a building from life safety performance to immediate occupancy
Site Mechanical Utility	64	7	Replacement of water wells, storm sewer infrastructure, or vehicle fueling facilities, installation of vehicle wash bays.

Prioritization of work plan projects to address risk is accomplished by the Facilities Asset Manager in accordance with strategic objectives, the Asset Management Plan, and other factors.

10.0 STRATEGY AND FUTURE STATE

BPA Facilities assumes future funding will be in line with present levels and has embarked on a number of initiatives which will provide incremental improvement to our cost management and execution capabilities. The initiatives described in Section 6 will help Facilities continue to manage the condition and performance of the facility asset base and prevent further deterioration of its most important assets. Under present funding levels, however, there is not sufficient resources to address all assets equally. The current environment dictates that Facilities investments according to mission criticality and that the organization continue to identify opportunities for greater program efficiency and cost reductions.

10.1 Future State Asset Performance

Facilities at BPA are non-revenue generating and represent a cost of doing business. The health, reliability and suitability of facility assets, however, are important factors enabling BPA’s Corporate and Transmission business lines. Accordingly, BPA Facilities, believes the *reliability* and *financial impact* of its assets are the most appropriate way to evaluate the performance of facility assets.

Required Table 10.1-1 Future Asset Performance Objectives

Objective	Reliability: Maintain critical facilities system uptime	Financial: Optimize O&M and lifecycle planning	Financial: Maximize asset utilization	Environmental: Reduce utility consumption
Future Performance Measure	<1% downtime and <5 asset failures for primary building systems/yr	10% reactive work 90% planned work	Building utilization at 90% of capacity – reduce lease space	Track resource consumption at occupied sites
This Year	Baseline downtime at (CL) 1 sites	Baseline % reactive work (metro)	Baseline metro sites utilization	Meter one additional site
Year +1	Baseline downtime at (CL) 2 sites	Baseline % reactive work (field)	Metro utilization at 70%	Meter one additional site
Year +2	< 1% downtime, CL 1 assets	> 40% reactive work (metro)	Metro utilization at 75%	Meter one additional site
Year +3	< 10 asset failures, CL 2 assets	> 70% reactive work (field)	Reduce lease space by 10%	Meter two additional sites
Year +4	< 9 asset failures, CL 2 assets	> 30% reactive work (metro)	Metro utilization at 80%	Meter two additional sites
Year +5	< 8 asset failures, CL 2 assets	> 60% reactive work (field)	Metro utilization at 85%	Meter two additional sites
Year +6	< 7 asset failures, CL 2 assets	> 20% reactive work (metro)	Reduce lease space by 30%	Meter three additional sites
Year +7	< 6 asset failures, CL 2 assets	> 50% reactive work (field)	Metro utilization at 80%	Meter three additional sites
Year +8	< 5 asset failures, CL 2 assets	> 10% reactive work (metro)	Metro utilization at 85%	Meter three additional sites
Year +9	< 5 asset failures, CL 2 assets	> 40% reactive work (field)	Reduce lease space by 50%	Meter four additional sites
Year +10	< 5 asset failures, CL 2 assets	> 30% reactive work (field)	Metro utilization at 90%	Meter four additional sites

10.2 Strategy

Strategy 1: Prioritized Asset Investment

The BPA Facilities organization are key enablers that facilitate the high-reliability of the BPA transmission system and sites that enable the BPA business. Given the limited execution resources and financial resources, BPA Facilities employs a prioritization strategy to direct resources first towards the most mission essential assets (criticality level 1, 2 and 3 assets). Criticality levels 1 and 2, e.g., control centers and substation control houses, are integral to the operations of the Bulk Electric System, and asset critically level 3 facilities, e.g., O&M maintenance headquarters, are required to maintain and restore the grid operations and serve as the primary field staffing locations. Significant degradation of these asset types will result in heightened risk to transmission reliability and impair BPA's ability to work efficiently.

The BPA Facilities strategy increases focus on high criticality assets while accepting continued degradation for asset criticality levels 4 and 5, e.g., storage and training buildings, due to their low impact to ongoing mission operations. Improvements to asset criticality levels 4 and 5 will be performed on a discretionary basis, as in the case of life safety or security concerns, but will typically be prioritized below criticality level 1, 2 and 3 assets.

Strategy 2: Resource Optimization

Anticipating that both human capital and financial resources supporting facility asset management will remain constrained for the foreseeable future, BPA Facilities will focus on initiatives which will maximize resources available through alternative project delivery methods and contract management tools. The key themes in this strategy are to (1) reduce the administrative burden associated with project development, (2) package and execute work with industry standards, thereby enabling competitive pricing from vendor pools, and (3) maximize utilization of BPAs office footprint.

- Reduce administrative burden and project cycle duration: The Integrated Facility Management (IFM) Contract implementation will simplify O&M work in the field by expanding the contracting tools and reducing overhead expense associated with vendor solicitation, reducing the number of procurement actions and alleviating project management resource constraints.
- Increase project bid-ability and shorten procurement windows: Facilities and Supply Chain uses alternative delivery methods with demonstrated success on large capital projects. However, this is an ongoing effort and additional project delivery methods are still being developed. Future expanding the use of CM/GC for capital renewals, Progressive Design-Build for capital replacement, and the integration of performance specifications to support the use of all Design-Build projects.
- Efficiency through project bundling and integrated planning: Integrated project planning can lower costs and improve the rate of execution. Facilities identifies and organizes work through Strategic Framework Guides (SFG) in which major BPA properties are reviewed prioritized facility improvements. This allows for project bundling and integrated forecasting of resources with major complexes. To date, SFGs are initiated or completed for the Ross Complex, Starr (Celilo), Covington and Bell Complexes.
- Right-Size office footprint: Space utilization at BPA's metro locations (Portland, Ross, Van Mall and 4400 Buildings) play an important role in cost management of the Facilities operating budget. Although staffing levels have and will remain dynamic, Facilities is assembling a suite of strategies that will inform a strategic approach to managing the metro office footprint over time. These strategies account for the ratio of lease to owned space, ideal staffing distribution and methods for maintaining office space "headroom" flexibility while still managing overhead costs.

10.2.1 Sustainment Strategy

BPA's facility asset base was largely built out between the early 1930s' and late 1950s'. Many of these assets which include civil and site infrastructure in addition to facilities assets are at end of their useful lives and in need of significant investment. In keeping with the overarching strategy of prioritization by criticality to the bulk electric system, the Facilities capital sustainment program is organized into four categories:

Sustain Capital: MHQ Replacements (Asset Criticality 3)

This investment category is focused on the replacement of Transmission Field Services (TF) facilities and is informed and prioritized through Strategic Framework Guides. The program prioritizes investment in BPA field properties in rank order and then identifies the individual investment actions of each site to achieve a top-down approach for scoping and sequencing investment. This program addresses three main objectives.

- Optimize lifecycle cost through capital replacement of end of life assets
- Optimize facility user workflows
- Improve continuity and reliability by enabling faster Transmission O&M response times

Sustain Capital: General Replacements (Asset Criticality 1, 2, and 3)

There are a range of small capital investments (<\$5M) that do not neatly fit within larger Facilities programs. These typically involve emerging business needs for equipment storage, office expansions, and upgrades to site infrastructure. The small general replacement portfolio includes projects ranging from capital betterment of facility building systems to infrastructure improvements that support the operations of existing facilities or complexes.

Sustain Capital: Demolition – HAZMAT Abatement/Retirements (Asset Criticality 2, 3, 4, and 5)

HAZMAT abatement and demo projects are typically both small capital (<\$500k) investments. Hazardous materials in the form of lead, asbestos, PCBs are present in the building assemblies and soils of many older BPA properties. Their removal is principally aimed at improving the health and safety of BPA's workplace.

Underutilized facilities no longer support mission needs and are considered for removal under this program. During capital replacement, the demolition of older facilities are accounted for in the total replacement cost of the new facility. But obsolete facilities for which there is no replacement are typically addressed as independent demolition actions under this program. Demolition of smaller, obsolete facilities or building systems are principally a cost management decision for O&M reduction and, in some cases, may also provide a safety mitigation action that reduces risk exposure.

Expense: O&M/ Renovations – Lifecycle refresh/system replacements (Asset Criticality 1, 2, and 3)

This investment category comprises the largest number of individual projects for Facilities and includes projects ranging from like-for-like system replacements to mid-lifecycle asset refreshes. These investments are aimed at building system replacements/repair rather than full asset replacement. The focus of this investment portfolio includes improved cost management and greater reliability of the transmission system.

The four areas of sustainment described above individually address asset objectives, but need to be considered as a whole to reverse the current course of asset deterioration of critical assets. A good example of this is the abatement and demo category which at first glance does not seem to align with the overall strategy of a focused approach on the most critical assets levels 1, 2 and 3, however under further review the removal of criticality level 4, and 5 assets that are underutilized will allow for resources and money that would be otherwise used to maintain these facilities to be

redirected to critical assets. Additionally, lifecycle refresh actions are vital to the proper management of an assets. However, existing assets may be deteriorated beyond the point where a mid-lifecycle refresh is economically viable (< 50% of the replacement cost) which would then trigger a replacement such as the MHQ replacement program.

10.2.2 Growth (Expand) Strategy

The BPA Facilities growth (expand) strategy is shaped by both internal and external influences. These are principally:

- **Safety:** Upgrade facilities and facility infrastructure to preemptively address emerging safety challenges;
- **Financial #1:** Support expanded capability and continuity of Transmission business services;
- **Financial #2:** Right-size and balance the ratio of leased and owned office facilities; and
- **Compliance:** Upgrade facilities and facility infrastructure to ensure compliance with model building codes and fire protection standards, and applicable federal regulations.

Expand Capital: Acquisition – Facility Growth (Asset Criticality 1, 2 and 3)

In many instances, facility sustain projects also have significant expand objectives. Due to the age and era of facilities, some buildings can no longer support modern equipment or operations. Typical facility expansion projects are supported by financial and safety drivers, which include new office development in lieu of continued lease, new control center development and MHQ development to replace field lease facilities. In some occurrences, this category also includes instances where substantial refurbishment of a facility will exceed more than 50% of the replacement cost of the existing facility.

Expand Capital: Acquisition – Building System Expansion (Asset Criticality 2 and 3)

This expand capital system category has two subcomponents. First, it includes projects that expand the facility capabilities at existing sites and include projects like civil improvements (storm water detention facilities, sally port additions), or an expansion of buried infrastructure to support a building replacement project. Investments in the category directly support transmission reliability and asset condition objectives by ensuring infrastructure is capable of meeting future business needs. Second, this category also includes whole MEP system replacements at sites where capabilities are insufficient or the risk of failure is high or imminent.

10.2.3 Strategy for Managing Technological Change and Resiliency

The BPA Facilities approach to technological change and resiliency will depend on whether the assets considered are planned or existing. Facility assets have relatively long lifecycles (typically 60+ years) and are fairly expensive to retrofit for most applications. For new assets, facilities are conceived and built according to several planning principles which account for growth, adaptability and resiliency.

Growth:

Facility investments are planned with the assumption that expandability will be required at some point in the future. This means that site selection, vehicle circulation design and facility placement are developed with the same growth requirement to offer a development path for future expansion. The MHQ program incorporates options for future growth as design requirement for all investments.

Resiliency:

The ability of BPA's facilities to remain operational under a wide variety of conditions is a function of its structural integrity and building safety design. To this end, Facilities follows four policies which enable the resiliency of facilities:

BPA Policy 440-75, Building Coder Governance Program: A multitude of corrective life safety actions taken over the last 15 years can be traced to a lack of life safety design standards. BPA Facilities instituted the BPA Building Code Governance Program to ensure that all BPA facilities are developed and refreshed according to the life safety standards of widely accepted model building codes and fire protection standards.

BPA STD-DS-000001-00-06, Seismic Policy: For all Transmission facilities, BPA employs facility structural design standards as a supplementary layer to model building codes to place additional safety factors according to asset criticality level. Safety factors are developed in cooperation with the Transmission Structural Design group (TEL) and are designed to ensure that mission critical functions are able to remain operational after all hazards events, e.g., seismic.

BPA Policy 432-1, Physical Security: BPA energized facilities and field sites are categorized as an “essential element” in maintaining BPA’s physical security under BPA Policy 432-1, Physical Security Program. In cooperation with the Physical Security Office (NNT), Facilities coordinates the integration of all physical security design standards under this policy.

BPA Policy 260-1, Continuity of Operations: BPA maintains plans for continuity capability to preserve its ability to deliver power and perform its mission essential functions under all conditions and recover from incident. Under this policy, Facilities coordinates with the Office of Security and Continuity of Operations (OSCO) to maintain a disaster recovery plan which stipulates alternate facilities for emergency relocation of mission essential functions.

10.3 Planned Future Investments/Spend Levels

The Facilities capital program requires average if \$39M each year (FY22 – FY32) with expenditures increasing in FY23 – FY24 to address capital expand control center replacement and then returning back to a historically more typical level of spend adjusted for inflation. FY25 and beyond reflect the returned focus on the MHQ replacement capital sustain program that is on hold during the period of investment into the new control center. Following industry guidance from the National Academy of Sciences for budgeting for capital renewal programs, funding for facility replacement and retirement should be provided in the amount of 2%-4% of the total portfolio replacement value. With a current replacement value of \$1.13B, that would represent annual capital investment ranging from \$23M to \$45M. Additionally industry standards for O&M costs are \$5 per square foot. Applying that standard to BPA’s portfolio of \$2.8M square feet yields an annual commitment of \$15M in direct construction expense funding, which does not include soft costs.

Additional contributing factors need to be considered when reviewing these recommended budgeting values. First and foremost is the current state of BPA facilities. The straight-line funding levels listed above assume a healthy overall current state of a facilities portfolio (FCI 0.00 to 0.10). BPA’s facility portfolio is currently in “serious” condition (FCI 0.30 to 0.39). Additionally, the industry standard funding levels defined above represent direct actual construction costs only, whereas BPA’s planned expense levels are inclusive of soft costs, e.g., program soft costs like labor and benefits, which renders expense program budgets effectively 25% less with the overhead burden included in the bottom line. With this assessment BPA Facilities are being funded below the industry standard level.

Taking into account these factors, the BPA operations incur increased risk from the likelihood of building system failures resulting from historical underfunding in O&M and lifecycle replacements. As a result, the need for facilities replacement and lifecycle refreshes will increase as the age of the portfolio grows at a faster rate than the executed replacement and refresh programs. Given the current financial and labor constraints and forecasted funding, BPA Facilities will be accepting increased risk of continued asset condition degradation across all but the facilities in asset criticality level 1, which include a lifecycle replacement in FY23 – FY25.

Table 10.3-1a, Future Investment

Program	Rate Case FY's		Future Fiscal Years							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Capital Expand (L4-1038)										
Acquisition-System Replacement	0M	0.9M	1.3M	0M	6.0M	4.0M	0M	0M	0M	0M
Acquisition-Bldg. Replacement	37.3M*	74.6M*	74.6M*	0M	0M	0M	0M	0M	0M	0M
Total Capital Expand	37.3M	75.5M	75.9M	0M	6.0M	4.0M	0M	0M	0M	0M
Capital Sustain (L4-1036)										
Acquisition-General Replacement	31.4M**	9M	0M	0M	1.3M	1.3M	1.3M	1.3M	1.3M	1.3M
Acquisition-MHQ Replacements	0M	0M	0M	0M	12.6M	15.3M	22.7M	22.5M	26.5M	19.7M
Demolition-Abatement/Retire	5.5M	3.7M	2.4M	4.3M	2.6M	2.4M	1.7M	1.8M	0M	0M
Total Capital Sustain	36.9M	12.7M	2.4M	4.3M	16.5M	19.0M	25.7M	25.6M	27.8M	21.1M
Total Facilities Capital	74.2M	88.2M	78.3M	4.3M	22.5M	23.0M	25.7M	25.6M	27.8M	21.1M

Expense (L4-1059)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Acquisition-Cap. Related Expense	3.4M	10.4M	11.1M	10.7M	4.6M	3.6M	2.5M	3.6M	2.6M	2.7M
O&M-Projects (NWM)	11.3M	4.3M	4.0M	4.8M	11.2M	12.6M	14.1M	13.5M	14.9M	15.2M
O&M-Repairs (NWF)	5.8M	5.8M	5.9M	6.1M	6.2M	6.4M	6.6M	6.7M	6.9M	7.1M
O&M-Repairs (TF)	6.5M	6.5M	6.6M	6.8M	7.0M	7.2M	7.3M	7.5M	7.7M	7.9M
Total Facilities Expense	27.0M	27.0M	27.6M	28.4M	29.0M	29.8M	30.5M	31.3M	32.1M	32.9M

* Vancouver Control Center lifecycle replacement (VCC)

** Ampere Lifecycle Replacement (Technical Services Building investment)

Table 10.3-1b, Lease, Utilities & Service Contract Expenditure

Expense (Leases/Util/Service)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
O&M-Lease (Corp) (L4-1550)	11.8M	11.9M	12.0M	12.1M	12.2M	12.3M	12.5M	12.6M	12.7M	12.8M
O&M-Lease (Trans) (L4-5025)	5.0M	5.1M	5.2M	5.4M	5.5M	5.6M	5.7M	5.8M	5.9M	6.1M
O&M-Util/Serv. (Corp) (L4-5025)	5.0M	5.0M	5.4M	5.6M	6.0M	6.4M	6.7M	7.1M	7.5M	7.9M
Total Lease Expense	21.8M	22.0M	22.6M	23.1M	23.7M	24.3M	24.9M	25.5M	26.1M	26.8M

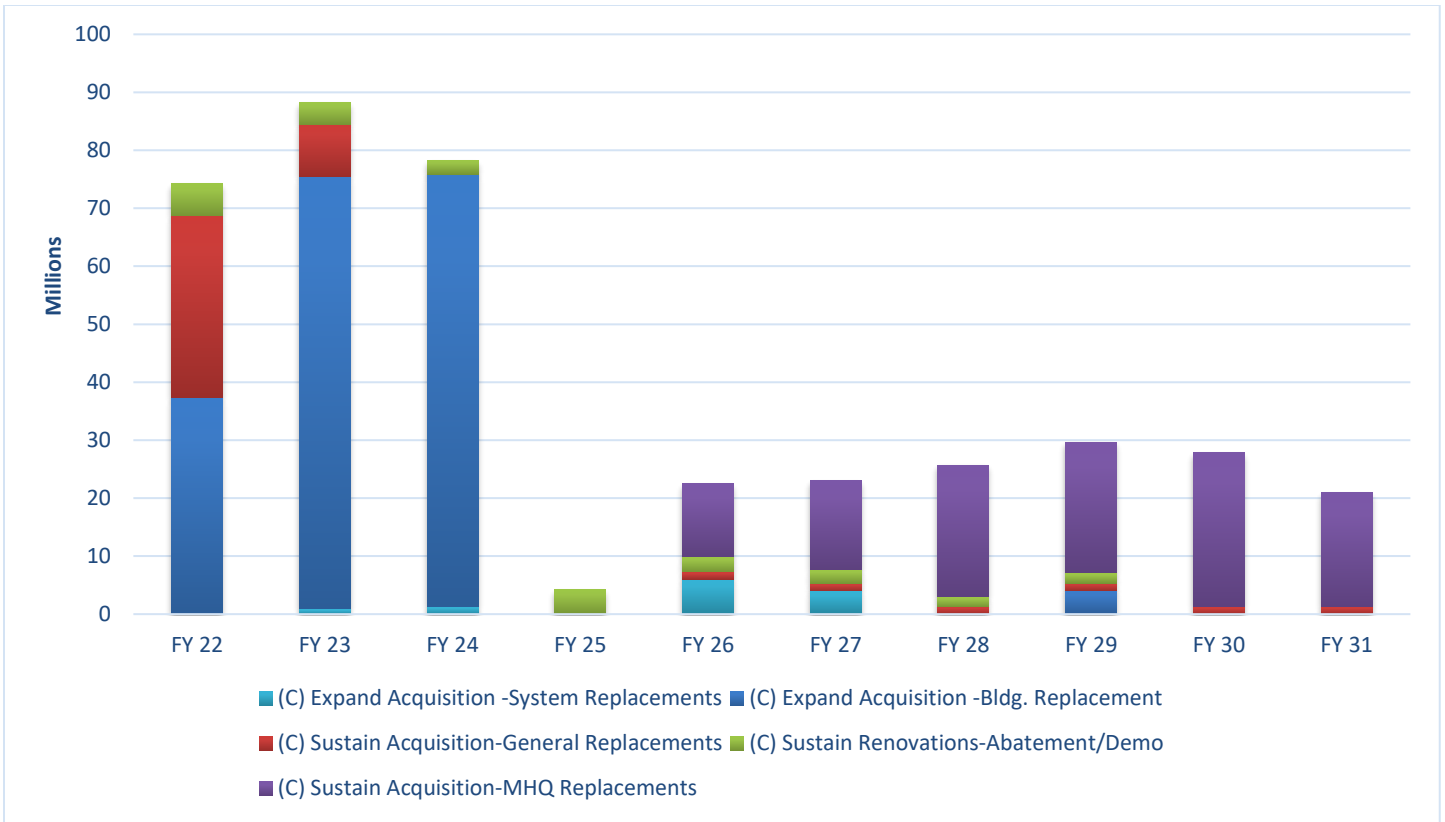


Figure 10.3-1, Future Spend-Capital

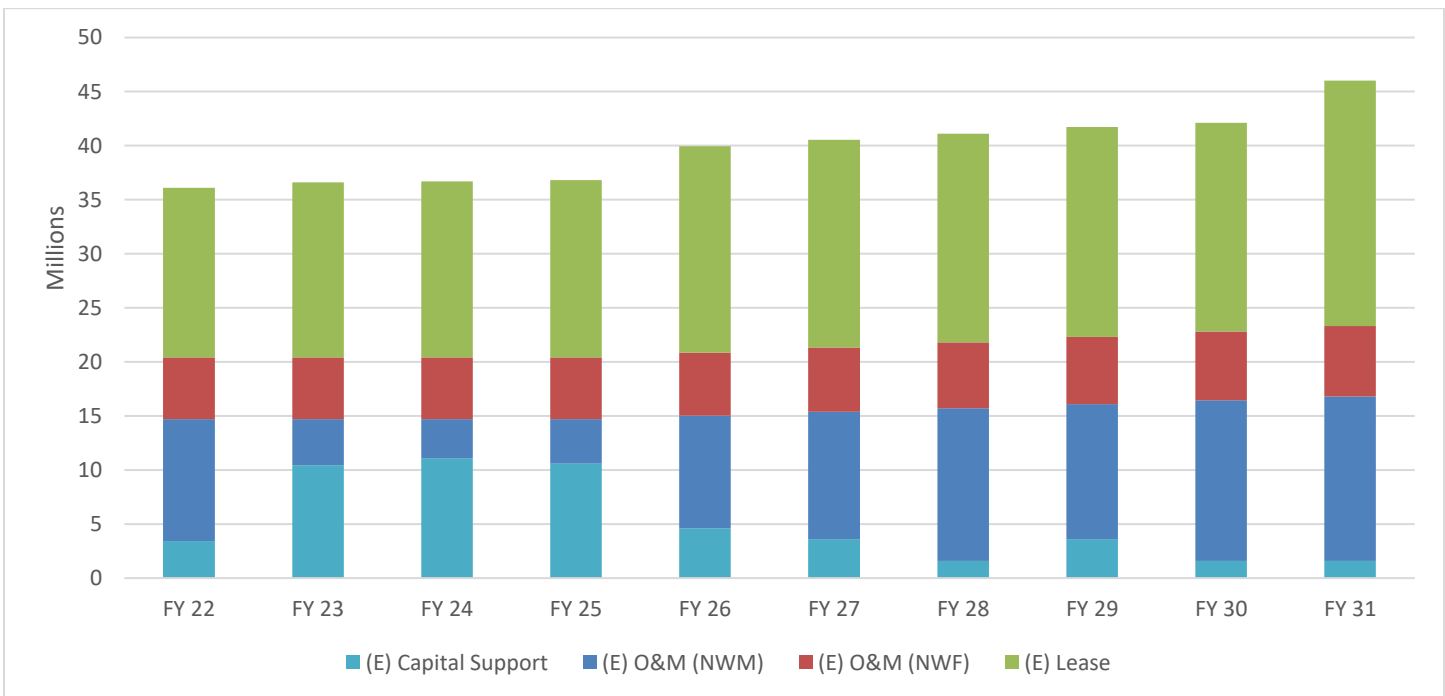


Figure 10.3-2, Future Spend-Expense

10.4 Implementation Risks

Risks associated with the implementation of the BPA Facilities strategy are outlined through the implementation risk categories defined below. Risk impacts are based on observed trends. Over the next five years, updates to the PgMIS, enterprise CMMS, establishing service level standards, and asset performance tracking will help bridge information gaps.

Table 10.4-1, Implementation Risks

Risk	Impact	Mitigation Plan
Access and Management of Facility Project Information	Limited visibility across business lines affecting timely resourcing and execution of facility projects.	Version 6 of the Facilities PgMIS will align the facility development process with the with transmission processes. This is a first and significant step towards better integration between business lines.
Delay in Performance Standards development	Challenges with consistent deliverables and slower execution during the design process	Develop standardize owner project requirements and performance specs for the most frequent types of work
Project Planning and Execution Capacity	Project management resourcing limitation allow for only one large capital project to be managed at a time, limiting throughput and flexibility in project sequencing.	Leverage design build vendors for design to reduce PM resourcing burden on BPA and allow more staff to focus on quality assurance
Multiple asset owners for asset category II	Facilities has limited visibility into full asset lifecycle of the second most critical asset category	Work closer with transmission program managers and tie project execution processes together between the groups.
Accurate Staffing Forecasting	Frequent changes to staffing forecast prevents a strategic and cost minded approach to managing office space footprint.	Develop flexible strategies with alternate scenario contingencies. Continue working with CAO and Transmission business line to maintain accurate staff forecasts.
Limited O&M Program Management and Execution Capacity	Facilities Planning and Projects diverts substantial resources t O&M work instead of acquisitions and major renovations	The IFM contract is a partial mitigation plan which will shift O&M actions at metro facilities to a contracted vendor to allow our limited resources to focus on core work. If successful, the model will be rolled out to field sites in FY22.
Adoption of alternative project delivery methods	Continued challenges to solicit competitive bids and limited ability to anticipate execution costs and schedule	Hire consultants to assist BPA project teams during the procurement phase in establishing contract language and standard processes.

10.5 Asset Condition and Trends

Due to the vast number of facilities and limited resources and funding it is anticipated that the overall condition of the facilities portfolio will continue to deteriorate for the next five to ten years until a significant investment in asset critically level 1 facilities and Ross Complex Strategic Framework Guide redevelopment investments are completed. This can be attributed to the roughly 25% of BPA Facilities assets being located on the Ross Complex, many of which are the oldest assets in the BPA portfolio. It is anticipated that the replacement and renovation of the oldest and most deficient facilities will drive a point of improvement in the overall portfolio condition. Lessons learned and key achievements at the Ross Complex redevelopment are establishing new project delivery methods, consistent project requirements, quality assurance methods, and facilities performance standards for use across the portfolio. These improvements will allow for efficient resourcing and consistent estimating towards the end of the strategy window (10 years). Specific trends of this strategy include the following:

Table 10.5-1 Asset Condition and Trends

Time Frame	Objective	Trend	Primary Driver
1-2 years	Transmission reliability	Moderate deterioration	Aging portfolio
	Asset Condition	Moderate deterioration	Failing systems
	Cost Management	Slow deterioration	Planning for a new control center
3-5 years	Transmission reliability	Slow deterioration	Ross redevelopment; Sustain system replacements
	Asset Condition	Slow deterioration	New facilities completing
	Cost Management	Significant deterioration	Capital investment starting to peak
5-10 years	Transmission reliability	Steady State	Shifting focus to field sites
	Asset Condition	Steady State	Shifting focus to field sites
	Cost Management	Significant improvement	Capital investment peak complete

10.6 Performance and Risk Impact

As discussed in Section 7, BPA Facilities approach to risk management will mature as more asset information is able to be tracked and trended. The subsequent assessment of risk, in accordance with the ISO-31000 methodology, forms the basis of the Facilities risk reduction strategy. It is intended to focus reductions primarily on risk to staff, operations and facility assets in all domains of risk compared to the status quo. While it is unlikely that asset conditions will markedly change or that unforeseen failures will reduce significantly, a deliberate risk mitigation strategy for in asset criticality levels 1, 2 and 3 can minimize their impacts. Additionally, these assessments provide a framework for the prioritization of key actions in the proactive management of the Facilities portfolio.

BPA Facilities portfolio risks and the associated strategies for risk mitigation in the near, mid and long-term are as follows:

10.6.1 Safety Risk

The safety and security of our BPA workforce is a core value at the BPA. Many Agency facilities are older and their construction was governed by older codes and standards, which may not align with current OSHA, building code and life safety requirements. Given the numbers of aged assets in this condition the BPA Facilities strategy is to prioritize addressing the assets that house the largest number of staff. Sites that fall into this category are typically metropolitan facilities and MHQ field sites. These larger sites and complexes are assessed through Strategic Framework Guides to establish site specific development strategies with safety by design principles.

These guides also structure capital replacement programs to retire and replace unsafe facilities with new code compliant ones. Through this path we will gradually reduce the number of systems that fall into the severe range of the risk heat map, however with the sheer number of deficient systems a focused effort of replacement through the expense program will be needed to improve asset conditions. Critical building systems in need of replacement are identified with site staff and inform the prioritized investment strategy in the short term. With an average replacement rate of <100 systems a year and current work capacity, it will not be likely that system replacements will be able to be completed in sufficient quantities in order to markedly improve conditions or match increasing numbers of premature failures. Longer term tracking of system condition data is needed to reduce risk in the category with any level of certainty.

Risk Category	Safety																																														
Asset Risk	Noncompliance with OSHA requirements, life safety codes, and modern seismic design standards are a liability to BPA and present safety risks for staff and resiliency risks for operations and critical assets.																																														
Owner/Control	NW/TF																																														
Risk Mitigation	<p>Strategy:</p> <ul style="list-style-type: none"> • Immediate – Consistently execute capital refresh programs to replace or bring aging assets into compliance (priority given the staffing centers) • Immediate – Prioritize system replacements at critical assets with available expense funding • 2 year – Refresh the asset registry to gain better trending information of system level improvements • 2-5 years – Extend the IFM contract to field site the replace more systems then we can with internal resources • 5-10 years – Realize improvement in the condition of systems (reduction of 20% of systems in severe condition) 	<p style="text-align: center;">Safety Risk of Building Systems</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td rowspan="5" style="writing-mode: vertical-rl; transform: rotate(180deg);">Likelihood</td> <td>Almost Certain</td> <td>2275</td> <td>5</td> <td>12</td> <td>1256</td> <td>7575</td> </tr> <tr> <td>Likely</td> <td>0</td> <td>0</td> <td>0</td> <td>3</td> <td>0</td> </tr> <tr> <td>Possible</td> <td>0</td> <td>4</td> <td>0</td> <td>0</td> <td>3</td> </tr> <tr> <td>Unlikely</td> <td>1</td> <td>1</td> <td>0</td> <td>9</td> <td>19</td> </tr> <tr> <td>Rare</td> <td>2177</td> <td>1664</td> <td>16</td> <td>2480</td> <td>7716</td> </tr> <tr> <td></td> <td></td> <td>Insignificant</td> <td>Minor</td> <td>Moderate</td> <td>Major</td> <td>Extreme</td> </tr> <tr> <td colspan="7" style="text-align: center;">Consequence</td> </tr> </table>	Likelihood	Almost Certain	2275	5	12	1256	7575	Likely	0	0	0	3	0	Possible	0	4	0	0	3	Unlikely	1	1	0	9	19	Rare	2177	1664	16	2480	7716			Insignificant	Minor	Moderate	Major	Extreme	Consequence						
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Figure 10.6-1, Strategy, Risk Assessment Safety

10.6.2 Reliability Risk

The reliability of facilities assets will generally stay consistent over the next ten years with a few notable differences across asset criticality type. Criticality type 1 assets will see the most change over this time period through the replacement of one of two control centers leading to an overall healthy reliability profile of both the facilities and their support systems. Critically level 2 assets will experience a slow decline in reliability as system continue to fall into the severe category for the first five year before we can start gaining ground with the IFM contract being extended to the field sites. Criticality level 3 sites will also slowly decline for the first five years as the focus will remain on the control center replacement before it can shift back to the MHQ replacement program at year five at which point improvements will resume. The net result is an anticipated reduction in risk however trending will be based only on observations until the asset registry refresh takes place in 2022.

Risk Category	Reliability																																													
Asset Risk	Severe SCI scores Aging portfolio Premature system failures																																													
Owner/Control	NW/NWF/TF																																													
Risk Mitigation	<p>Strategy:</p> <ul style="list-style-type: none"> • Immediate – Coordinate with the transmission group to track the replacement of critically level 2 assets and review the impact to system conditions • Immediate – Prioritize system replacements at critical assets with available expense funding • 2 years – refresh the asset registry to gain trending data • 2-5 years – Replacement of a Control Center • 2-5 years – Extend the IFM contract to field site the replace more systems then we can with internal resources • 5-10 years – Shift focus back to the MHQ replacement program 				<p>Reliability Risk of Building Systems</p> <table border="1"> <thead> <tr> <th rowspan="2">Likelihood</th> <th colspan="5">Consequence</th> </tr> <tr> <th>Insignificant</th> <th>Minor</th> <th>Moderate</th> <th>Major</th> <th>Extreme</th> </tr> </thead> <tbody> <tr> <th>Almost Certain</th> <td>0</td> <td>1</td> <td>0</td> <td>1214</td> <td>8983</td> </tr> <tr> <th>Likely</th> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <th>Possible</th> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>4</td> </tr> <tr> <th>Unlikely</th> <td>0</td> <td>0</td> <td>0</td> <td>9</td> <td>19</td> </tr> <tr> <th>Rare</th> <td>0</td> <td>0</td> <td>0</td> <td>2252</td> <td>10010</td> </tr> </tbody> </table>	Likelihood	Consequence					Insignificant	Minor	Moderate	Major	Extreme	Almost Certain	0	1	0	1214	8983	Likely	0	0	0	1	0	Possible	0	0	0	0	4	Unlikely	0	0	0	9	19	Rare	0	0	0	2252	10010
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Figure 10.6-2, Strategy, Risk Assessment Reliability

10.6.3 Financial Risk

The local construction market remains brisk and labor availability is tight. This is leading to higher design and construction prices on all building system replacement and facility replacement projects. This upwards price pressure creates a financial risk due to the limit it applies to the amount of work that can be performed within a fixed budget and, as time goes by, inflation compounds this problem. This may be addressed in the capital program through focusing BPA Facilities resources on better utilization of available capital funding by shifting the focus from reactive break-fix and O&M replacements to full asset replacements. This would lead to the ability for the simultaneous execution of two major capital projects if program delivery may be improved through a consolidation of O&M service contract actions. Additionally, alternative project delivery methods, such as design-build and progressive design-build, may be used to transfer the execution resource burden from internal resources to contracted external vendors. Secondary benefits of a shift to alternative delivery methods would include improved certainty of project schedules and costs, which are needed to balance the spend levels at the limit of available program funding.

Risk Category	Financial																																														
Asset Risk	Inability to consistently track project expenditures over the project lifespan. Market conditions driving costs higher than planned. Expense funding held flat, not pacing construction inflation.																																														
Owner/Control	NWM/NWF/TF																																														
Risk Mitigation	<p>Strategy:</p> <ul style="list-style-type: none"> • Immediate – Implement alternative project delivery methods • Immediate – Develop performance specs and owner project requirements to support DB efforts. • 2 years – refresh the asset registry to gain trending data • 2-5 years – Extend the IFM contract to field site the replace more systems then we can with internal resources • 5-10 years – Establish an execution plan with simultaneous capital replacement projects in design while another proceeding plan is under construction. 	<p style="text-align: center;">Financial Risk of Building Systems</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td rowspan="5" style="writing-mode: vertical-rl; transform: rotate(180deg);">Likelihood</td> <td>Almost Certain</td> <td>0</td> <td>0</td> <td>0</td> <td>177</td> <td>1773</td> </tr> <tr> <td>Likely</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Possible</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>4</td> </tr> <tr> <td>Unlikely</td> <td>0</td> <td>0</td> <td>0</td> <td>8</td> <td>19</td> </tr> <tr> <td>Rare</td> <td>1</td> <td>0</td> <td>0</td> <td>1265</td> <td>3198</td> </tr> <tr> <td></td> <td></td> <td>Insignificant</td> <td>Minor</td> <td>Moderate</td> <td>Major</td> <td>Extreme</td> </tr> <tr> <td></td> <td></td> <td colspan="5" style="text-align: center;">Consequence</td> </tr> </table>	Likelihood	Almost Certain	0	0	0	177	1773	Likely	0	0	0	0	0	Possible	0	0	0	0	4	Unlikely	0	0	0	8	19	Rare	1	0	0	1265	3198			Insignificant	Minor	Moderate	Major	Extreme			Consequence				
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Figure 10.6-3, Strategy, Risk Assessment Financial

10.6.4 Environmental Risk

The primary impact of not meeting Agency reduction targets in energy and water consumption is an increase in O&M costs at established facilities. This results in increase financial pressure on existing expense programs and limits the ability to focus on metering efforts needed to fully understand the agencies facilities environmental impact as most of the expense budget is prioritized to reactive break fix projects, creating a negative feedback loop. More efficient execution of expense funding through third party management of O&M system replacements will allow for increased metering and data gathering prioritizing future investments to address the existing data gap.

Risk Category	Environmental																																														
Asset Risk	Inability to meet Agency reduction targets for energy and water consumption. Effects of global warming on assets.																																														
Owner/Control	NWO																																														
Risk Mitigation	<p>Strategy:</p> <ul style="list-style-type: none"> • Immediate – Expand Capital acquisition program will create facilities that consume fewer resources, address global warming impacts, and track their resource consumption • Immediate – Sustain Capital repair/renovation program will create facilities that consume fewer resources, address global warming impacts, and track their resource consumption 2 years – refresh the asset registry to gain trending data • 2-5 years – Establish metering at 20% of currently unmetered field sites. • 5-10 years – Establish metering at 50% of currently unmetered field sites. 	<p>Environmental Risk of Building Systems</p> <table border="1"> <tr> <td rowspan="5">Likelihood</td> <td>Almost Certain</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>1245</td> </tr> <tr> <td>Likely</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Possible</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Unlikely</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Rare</td> <td>3</td> <td>17</td> <td>0</td> <td>0</td> <td>2083</td> </tr> <tr> <td></td> <td></td> <td>Insignificant</td> <td>Minor</td> <td>Moderate</td> <td>Major</td> <td>Extreme</td> </tr> <tr> <td></td> <td></td> <td colspan="5" style="text-align: center;">Consequence</td> </tr> </table>	Likelihood	Almost Certain	0	1	0	0	1245	Likely	0	0	0	0	0	Possible	0	0	0	0	1	Unlikely	0	0	0	0	0	Rare	3	17	0	0	2083			Insignificant	Minor	Moderate	Major	Extreme			Consequence				
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Figure 10.6-4, Strategy, Risk Assessment Environment/Trustworthy/Stewardship

10.6.5 Compliance Risk

The risk of not complying with regulations and guidelines is both punitive through possible fines and also operational if we can't afford to bring older sites into compliance with security and continuity standards. Given the average age of BPA facilities and the number of deficient systems it is impractical to address all field sites compliance issues in a short period of time. Therefore it is intended that as asset refresh projects are executed, all identified compliance concerns will be addresses as part of that effort. Individual systems not in compliance with regulations or codes will continue to be addressed through the expense renovation/repair program on a prioritized basis that balances field, and program goals. Audits of the existing field sites to gain a better understanding of the current state of compliance with regulations and guidelines will quantify this risk to the Agency through the update to the asset registry.

Risk Category	Compliance																																														
Asset Risk	Fines and or undue vulnerabilities due to noncompliance with regulations, guidelines, and standards.																																														
Owner/Control	NNT, NW																																														
Risk Mitigation	<p>Strategy:</p> <ul style="list-style-type: none"> • Immediate – Apply BPA code compliance policy 440-75 to all future projects. • Immediate – Establish an internal AHJ council to review and approve variances to code compliance as needed to support operations. • Immediate – Expand Capital acquisition program will create facilities that comply with all applicable regulations and codes. • Immediate – Sustain Capital repair/renovation program will address all compliance issues at that site. • 2 years – Refresh the asset registry to identify outstanding compliance issues. • 5-10 years – Reduce the number of deficient systems by 20% of the existing total. 	<p style="text-align: center;">Compliance Risk of Building Systems</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td rowspan="5" style="writing-mode: vertical-rl; transform: rotate(180deg);">Likelihood</td> <td>Almost Certain</td> <td>0</td> <td>1</td> <td>0</td> <td>1214</td> <td>8919</td> </tr> <tr> <td>Likely</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Possible</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>3</td> </tr> <tr> <td>Unlikely</td> <td>0</td> <td>0</td> <td>0</td> <td>9</td> <td>19</td> </tr> <tr> <td>Rare</td> <td>0</td> <td>37</td> <td>0</td> <td>2522</td> <td>9639</td> </tr> <tr> <td colspan="2"></td> <td>Insignificant</td> <td>Minor</td> <td>Moderate</td> <td>Major</td> <td>Extreme</td> </tr> <tr> <td colspan="2"></td> <td colspan="5">Consequence</td> </tr> </table>	Likelihood	Almost Certain	0	1	0	1214	8919	Likely	0	0	0	1	0	Possible	0	0	0	0	3	Unlikely	0	0	0	9	19	Rare	0	37	0	2522	9639			Insignificant	Minor	Moderate	Major	Extreme			Consequence				
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Figure 10.6-5, Strategy Risk Assessment Compliance

10.7 Performance Impact

The future state of the facilities portfolio will be realized through the achievement of the performance targets established in Section 8 (current state). Targets that will be met in the future state include the following categories: *FCI (facility condition index), Efficiency of Facilities, Life Safety, Security, and Financial Performance.*

Table 10.7-1 Facility Condition

Facility Condition Index #1					
Measure:	<i>Current FCI scores for BPA facility assets as an average score across each asset category</i>				
Background:	The average FCI score is .24 (poor). This represents an unacceptable financial and operational risk to the Agency.				
End-State Target:	Asset Criticality level 1: Improve from .21 "Poor" currently to .10 - .20 "Fair"	Asset Criticality Type 2: Improve from .37 "Serious" currently to .20 - .30 "Poor"	Asset Criticality Type 3: Improved from .36 "Poor" currently to .20 - .30 "Poor"	Asset Criticality Type 4: Degrade from .37 "Serious" currently to .4+ "Critical"	Asset Criticality Type 5: Degrade from .28 "Poor" currently to .30 - .40 "Serious"
Inclusions/ Exclusions	Include - All BPA facilities. Excluded – Non building assets				
Measure Owner:	NW – Workplace Services				

Table 10.7-2 Financial Performance

Financial Performance #1A/B	
Measure:	<i>1A: Efficiency of Asset Type 3 Facilities #1: Percentage of facility office space utilization. 1B: Efficiency of Asset Type 3 Facilities #2: Percentage of assets in need of retirement.</i>
Background:	The ongoing cost to house staff is increasing on an annual basis due to escalating lease cost and growing maintenance costs for aging assets. At the same time the available amount of expense money that covers lease holdings ins being burdened by an increasing number of systems failures. In order to control cost escalation one or both of these issues needs to be resolved.
End-State Target:	Baseline the utilization rates of metro facilities Baseline the utilization rates of field facilities Retire all underutilized facilities Obtain a 90% utilization rate for metro facilities Reduce the reliance on leased facilities by 50%
Inclusions/ Exclusions	Include - Full range of facilities of within the BPA portfolio. <u>Excluded</u> – Safety issues created by energized equipment outside of the facilities asset portfolio
Measure Owner:	NW – Workplace Services

Table 10.7-3 Life Safety

Life Safety #1A/B	
Measure:	<i>1A: Life Safety: Number of fire and life safety system upgrades completed each year:</i> <i>1B: Life Safety: Number of fire and life safety assessments completed each year:</i>
Background:	With an average asset age of over 30 years a large number of BPA facilities have life safety challenges when viewed through the lens of current building codes and OSHA requirements.
End-State Target:	Survey and identify outstanding life safety concerns at all major staffing location (mostly critically level 3 assets Address life and life safety issues at 20 or more surveyed sites Align all work with BPA policy 440-75
Inclusions/ Exclusions	Include - Full range of facilities of within the BPA portfolio. <u>Excluded</u> – Safety issues created by energized equipment outside of the facilities asset portfolio
Measure Owner:	NW – Workplace Services

Table 10.7-4 Dwell Time

Dwell Time	
Measure:	<i>Dwell Time: Number of business days spent in each project delivery phase</i>
Background:	BPA Facilities currently tracks project performance data through the version 5 of our PgMIS, however the data points that are tracked do not provide fine grained enough data to see how long project stay in each phase of work. This data is need to be able to balance and plan resourcing of projects to gain more efficient execution of work.
End-State Target:	Acquire and archive dwell time for every project through the following process groups: (1) project initiation, (2) scoping, (3) procurement, (4) activation, and (5) closeout Perform annual lessons learned to identify challenges in the process groups with the greatest dwell time Implement corrective actions to address lessons learned on an annual basis.
Inclusions/ Exclusions	Include - Full range of facilities of within the BPA portfolio. <u>Excluded</u> – Criticality level 2 projects that are executed by transmission
Measure Owner:	NW – Workplace Services

11.0 ADDRESSING BARRIERS TO ACHIEVING OPTIMAL PERFORMANCE

With the collective age and number of system deficiencies affecting BPA facilities assets there are a number of barriers that are preventing our program from reaching the optimal asset management performance. Some of these challenges are inherent with the funding and resource constraints that the Agency is experiencing and will be difficult to address while others can be more easily resolved through staff training and reallocation of existing resources and responsibilities. The following list identifies the most significant gaps to optimal performance and proposes the actions that can be taken to address these challenges.

Table 11.0-1 Barrier to Optimal Performance

Barrier to Optimal Performance	Responsible Org.	Mitigation (short term)	Mitigation (long term)
Lack of long term trending data on asset performance	NWM	<ul style="list-style-type: none"> • Implementation of PgMIS V6 • Update Asset Registry 	<ul style="list-style-type: none"> • Correlate investments to changes in asset performance
Shared ownership of criticality level 2 assets	NWM/ TPW	<ul style="list-style-type: none"> • Coordinate with TPW on planned investments 	<ul style="list-style-type: none"> • Establish partnership agreement with TPW
Staff distribution and forecasting	NWM/NWPS	<ul style="list-style-type: none"> • Complete Metro Space Study 	<ul style="list-style-type: none"> • Survey and track utilization rate at field sites
Unified O&M program	NWM/NWF/ TF	<ul style="list-style-type: none"> • Implement IFM contract • Establish a CMMIS 	<ul style="list-style-type: none"> • Shift all O&M portfolio from NWM to NWF
Limited Expense Funding	NWM/NWF	<ul style="list-style-type: none"> • Implement alternative project delivery methods • Shift focus to Capital Renewal and Replacement 	<ul style="list-style-type: none"> • Extend IFM contract to field sites
Limited Resources	NW/TENF/ TETC/NSSV	<ul style="list-style-type: none"> • Leverage vendor services 	<ul style="list-style-type: none"> • Integrate facilities planning, design, and execution into one group
Staff Training	NW/TENF/ TETC/NSSV	<ul style="list-style-type: none"> • Structure training program around strategic objectives 	<ul style="list-style-type: none"> • Coordinate training across all project execution partners

12.0 DEFINITIONS

Asset Register: A structured electronic information system used to manage asset information, health and condition. The current system used by BPA Facilities is a program known as VFA (Vanderweil Facility Advisors).

Computerized Maintenance Management System (CMMS): A structured electronic information system used to manage operations and maintenance work requests and track costs within facility building systems and facility assets.

Facility Condition Index (FCI): An accepted industry metric for determining the relative condition of constructed assets.

Institute of Asset Management (IAM): The international professional body for asset management professionals. The IAM develops asset management knowledge and best practice, and generates awareness of the benefits of the asset management discipline for the individual, organizations and wider society.

Investment Classifications: Financing categories for relation to internal/external BPA stakeholder audiences.

Compliance: Must be an executive order/directive requiring the specific investment must be made and that the project as proposed includes only the minimum required to comply with the directive. For example Cyber Security, Highway Relocations, Biological Opinion

Replacements: In-kind replacement of equipment and components. For example, wood poles, transformers, batteries, existing buildings, breakers, reactors, and conductors.

Upgrades/Additions: Replacement of existing assets that provide addition capacity and/or capability. Examples include breakers, transformers, lines, etc. that after replacement have higher ratings to transfer power. Replacement of applications that provide new capability

Expansion: Adding new assets to the system that did not exist before providing new capability. Examples include: new IT applications, new buildings, and new units at existing power generation sites, new line and substations.

Program Management Information System (PgMIS): Structured electronic information system created and used by BPA Facilities for the following: a) managing the planning, execution and performance of projects, b) managing the tracking and benefits of the Facilities program, and c) providing reporting resources and real-time visibility into projects and the portfolio.

Strategic Framework Guide (SFG): A comprehensive planning and redevelopment structure to assess historic, current and future business needs along with existing conditions in order to provide programming, concepts and implementation strategies for future investments.

System Condition Index (SCI): An accepted industry metric for determining the relative condition of building systems.

13.0 APPENDIX

This section provides clarifying reference information that is introduced in the body of the SAMP.

13.1 Physical Security Investments FY 22 – FY31

The physical protection of BPA buildings and facilities is accomplished through the use of security measures to include: contract security officers, alarm systems, cardkey access systems for after hours and special access needs, and closed circuit TV. These physical security measures are further supported by the employees' use and full time display of their ID badge (DOE Security Badge or Local Site Specific Only Badge). Capital Investments in BPA Physical Security assets infrastructure are prioritized and planned to provide incremental enhancements in order to minimize Agency risk exposure in accordance with regulatory and federal requirements. Investments for FY22 – FY31 are listed below.

Table 13.1-1 Physical Security Investments

Table redacted as it contains sensitive asset location and pricing information.