STRATEGIC ASSET MANAGEMENT PLAN – 10 YEAR OUTLOOK

For BPA Facilities

This Strategic Asset Management Plan for Facilities provides alignment between the Agency strategy, stakeholder requirements, organizational objectives and resulting asset management objectives to ensure that BPA facilities assets are managed and measured to create and deliver value.

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1.0 EXECUTIVE SUMMARY

BPA Facilities serves a key role in facilitating the high-reliability of the Bulk Electric System and enables the full spectrum of BPA business activities across the Pacific Northwest. This Facilities Strategic Asset Management Plan (SAMP) provides line-of-sight alignment with the BPA Strategic Plan 2024 – 2028 strategic goals and outcomes. Through lifecycle planning and actionable execution strategies, BPA Facilities seeks to enhance staff safety and security, strengthen resource stewardship, and maximize the value of assets while minimizing risk. The resulting asset management objectives ensure that Facilities assets are managed over their lifecycles to deliver value to BPA and, therefore, to the customers and communities of the Pacific Northwest.

The strategic focus in the BPA Facilities Strategic Asset Management Plan (SAMP) includes:

- Strategic capital program investment into replacements of critical assets;
- Align capital and expense programs to support Transmission capital Expand acquisitions;
- Increase program execution capacity to ensure timely and cost-effective delivery;
- Continue development of organizational competencies within the Institute of Asset Management framework; and
- Improve the Facilities Asset Management System to ensure that staff and technical resources are connected and capable of delivering risk-informed decision making.

BPA Facilities will partner with key BPA business partners to bolster the success of these asset management strategies. Specific focus is required in the coordination of operations and maintenance (O&M) activities across Transmission and the Chief Administrative Office, and in providing sufficient and competent contracting resource support of programs.

2.0 ACKNOWLEDGEMENTS

2.1 Senior Ownership

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 BPA strategic goals;
- 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 am committed to the continued improvement of our BPA Facilities program through the continued development of asset management competencies and fundamentals. We see continued opportunity to make informed investments in our assets in order to rationally respond to the real challenges presented by constraints in labor, services and supply chain markets. I am confident that our active collaboration with our BPA business partners and our attention to asset management principles will enable BPA Facilities to meet these challenges with our coordinated organizational strength.

ROBIN FURRER

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Robin Furrer

Chief Administrative Officer

2.2 Strategy Development Approach

2.2.1 Key Contributors

BPA Facilities strategic planning for FY24 was led by the BPA Facilities Planning and Projects Manager and support staff. Dozens of individuals across Facilities and Transmission contributed by sharing insights, information, research, facility assessments, future forecasts, and strategies. (BPA Strategic Plan Outcome 4.2.4)

2.2.2 Key Activities

Key activities managed for SAMP development include:

- Review of existing strategy and initiatives;
- Analysis of existing asset management information;
- Asset management research and investigations to deliver a comprehensive strategic narrative;
- Asset Management Maturity Assessment by representative sample of Facilities subject matter experts; and
- Alignment with the BPA Strategic Plan 2024 – 2028 outcomes.

3.0 STRATEGIC BUSINESS CONTEXT

3.1 Alignment of SAMP with Agency Strategic Plan

The Facilities SAMP outlines achievable strategies which seek to maximize the value of the BPA facilities portfolio while mitigating the safety, reliability, financial, environmental and compliance risks to the program posed by an aged infrastructure. This SAMP establishes a framework used to align efforts over the next ten years of investments in accordance with the BPA strategic goals: 1) invest in people, 2) enhance the value of products and services, 3) strengthen financial health, 4) mature asset management, 5) preserve safe and reliable system operations, and 6) modernize business systems and processes. The framework herein informs the Facilities Asset Plan (AP) and guides the creation of the specific targeted efforts, resources and schedules required to support the delivery of strategic goals and objectives.

The Facilities SAMP focuses on three asset management objectives, which align with the BPA Strategic Plan as follows:

- **Asset Management Objective 1: Provide safe, healthy and professional workspace for BPA personnel**
  - A) Acquisition of new facilities and renovation of existing facilities as they reach their mid-lifecycle refresh window ensures BPA staffing centers are safe and secure of all staff and visitors.
- **Asset Management Objective 2: Enable reliable, efficient and flexible operations of all BPA organizations**
  - A) Acquisition of new facilities and retirement of underutilized facilities reduces high O&M costs and dependency upon leased space. Continue facility efficiency improvements to reduce O&M costs.
  - B) Focus 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.**
  - 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 performance standards and human resource recruitment and retention 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.

Table 3.1-1, SAMP Alignment with BPA Strategic Goals

2024 – 2028 BPA Strategic Goals	Facilities Objective 1 (Safety)	Facilities Objective 2 (Reliability)	Facilities Objective 3 (Value)
1. Invest in People	X	X	X
2. Enhance the Value of Products and Services		X	X
3. Sustain Financial Strength		X	X
4. Mature Asset Management		X	X
5. Preserve Safe and Reliable System Operations	X	X	X
6. Modernize Business Systems and Processes		X	X

3.2 Scope

BPA Facilities assets play a major role in the O&M of Bulk Electric System and house all BPA staff and equipment. The Facilities portfolio covers building assets from mission critical control centers to vehicle storage buildings. Assets that are not covered include those in the Transmission SAMP (transmission lines, towers, technology systems, undeveloped real estate, etc.), and USACE/ USBR facilities covered in the Fed Hydro SAMP. Office space in leased facilities are assets and incur a cost which must be considered. Facilities program scope items are organized as follows:

BUILDING ASSETS (included)

Facility assets support business operations and the O&M 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. All building systems and fixed infrastructure, e.g., network cable plant, etc., are included for prioritized execution in this SAMP.

COMMERCIAL LEASES (included)

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

PERSONAL PROPERTY (not included)

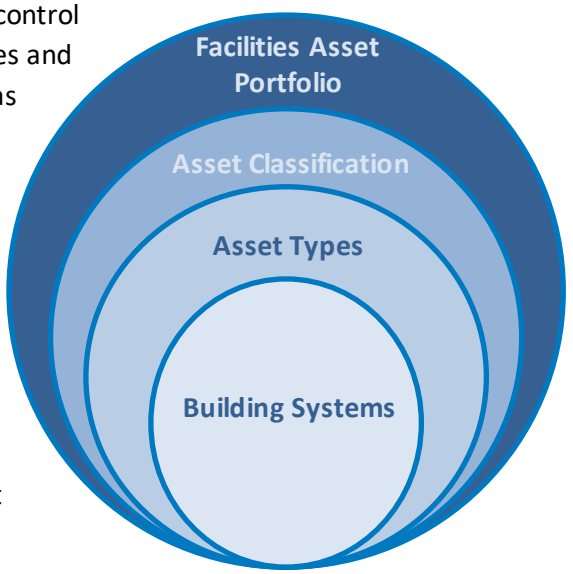
Materials, equipment and non-fixed enclosures are specifically excluded in this strategy as they support itinerant or temporary organizational needs on BPA sites.

LAND (not included)

Undeveloped land assets are specifically excluded in this strategy and 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 Facilities owns and operates 2.9 million square feet of facilities with an estimated value of $1.6 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 facilities support all aspects of BPA business. Assets such as Maintenance Headquarters support Transmission field operations across BPA's service territory and space for Fleet to maintain and store inventory. Control Houses contain equipment critical to Transmission operations and administrative offices house the BPA workforce. All assets support the mission of providing electricity to the Pacific Northwest.



BPA Facilities is also responsible for the leasing, operations and management of 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.

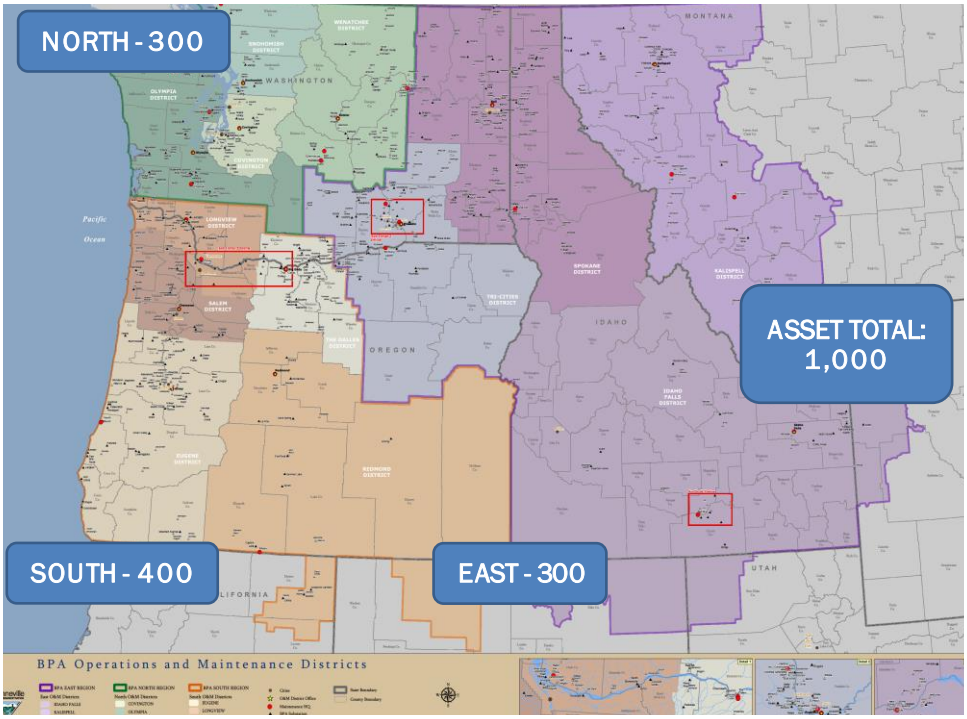
BPA facilities and supporting infrastructure span 300,000 square miles of service area and are divided into three regional operating areas. These three Regions (North, East and South) are further divided into thirteen O&M Districts. Regions and Districts have a spectrum of climates, which often dictate working conditions, tools and equipment needs. Regions vary geographically, e.g., mountains, desert, coastal, which influences facility designs, performance and maintenance needs.

Facility assets are grouped into five asset classifications relative to their asset criticality. Facility "criticality" pertains to asset importance in support of O&M of the Bulk Electric System. Facilities asset criticality is outlined in Section 7.

Table 3.3-1, Summary of Assets

CRITICALITY LEVEL	ASSET CLASSIFICATION	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	Storage Building Untanking Tower Fueling Station/Wash Bay	
5	Other	Decommissioned Oil House		

Figure 3.3-2, Asset Locations by Region



3.4 Demand Forecast for Services

BPA Facilities plans for asset modernization and optimization, as well as O&M services. The demand forecast for facility-related services is expected to remain relatively constant over the next 10 years. As BPA workforce size, staff locations, and Transmission business requirements evolve, Facilities anticipates the following adjustments:

1. **Emerging Transmission Business Requirements** (Asset Modernization): Demand for facility lifecycle replacements is relatively predictable, however, some facility modernization efforts arise out of Transmission's need to quickly respond to emerging business needs. Transmission compliance and reliability objectives may directly affect the timing and prioritization of BPA Facilities modernization efforts.
2. **Workforce Fluctuation** (Asset Optimization): BPA Facilities provides office strategic occupancy planning to support BPA business requirements in an efficient and cost-effective manner. Facilities plans for a 10% increase in federal staffing to support the Transmission Evolving Grid initiative, as well as corresponding occupancy planning services and interior office projects. Fluctuations beyond the Transmission increase, future changes to staffing distribution in the Portland/Vancouver metro area and changes to BPA remote employee and telework policies will increase the need for Space Planning services.
3. **Asset Condition** (O&M Services): New BPA facility assets are being added with the ongoing construction of Transmission microwave radio buildings and control houses, and O&M needs will expand. Existing asset conditions are increasingly poor across most building systems requiring more resources to maintain end of life assets. Reliability curves of the individual system components will continue to decline across the portfolio. BPA Facilities O&M is also influenced by commercial inflation and limited availability of services.

3.5 Strategy Duration

This SAMP spans a 10-year planning period, which is a snapshot of a facility's typical 50-year lifespan. This strategy will be reviewed and updated in 2027 to align with BPA's Integrated Program Review (IPR) schedule. A 10-year planning horizon

with refreshes at regular intervals allows BPA Facilities to plan for mid-lifecycle refreshes at appropriate times of an asset's overall lifecycle. As part of the planning process, the following assumptions are made:

- Each SAMP iteration will focus on closing information gaps from the prior version;
- Asset performance improvement strategies will be refined based upon performance metrics; and
- Funding and resource gaps will be addressed as appropriate based upon BPA investment prioritization.

4.0 STAKEHOLDERS

4.1 Asset Owner and Operators

BPA Facilities is responsible for the planning, project execution and O&M for BPA assets. Transmission Services provides for the asset acquisition of new Transmission energized facilities and also for O&M services at Field Services sites. While daily O&M actions are performed by Transmission Field Services District staff, maintenance funding, repair and renewal is the responsibility of BPA Facilities. Facilities O&M staff manage and maintain Headquarters, Ross Complex and Munro Control Center. Additionally, Facilities O&M operate and maintain leased sites in Portland, Vancouver, Seattle and some Field Services sites. Commercial office leases represent over 60% of the Facilities O&M (NWF) expense budget.

4.2 Stakeholders and Expectations

BPA Facilities' stakeholders are all internal BPA organizations which rely upon BPA facilities to perform their business. Primary stakeholders are BPA organizations dependent upon BPA facilities to conduct their operations, e.g., tenants (Regional Managers/District Managers/staff), functional work groups and category asset managers. Secondary stakeholders are those with shared responsibility for support of operational and compliance requirements, e.g., Subject Matter Experts from compliance and service organizations (Safety, Physical Security, Fleet, IT and Environmental).

Table 4.2-1, Stakeholders

Stakeholder	Expectations	Current Data Sources	Measures
BPA	Low Rates	Long Term Rates Forecasting Tool, Focus 2028	Budget Forecasts, Long-Term Planning
	Reliability	Asset registry database	NFPA 110
	Quality	Asset registry database	Facility Condition Index (FCI)
	Safety	Industry regulations and standards	Incident reports, corrective action reports
	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
	Category Asset Managers	SAMP, Asset Plans	Inter-organizational integration of plans
	Compliance	Resolver	Legal and statutory compliance for A-123
	Environmental Resource Stewardship	Industry regulations and standards (NEPA) Financial system Utility tracking system	Environmental Assessments Pollution Abatement Clearances Energy/Water Use Intensity (EUI/WUI)
	Cultural Resource Stewardship	Industry regulations and standards (NEPA)	SHPO Programmatic Agreements and Memoranda of Agreement
	Risk Exposure	Risk analysis models in business cases	Risk ranking
	Regulation Compliance	Resolver	Internal/External Audit, RSIPP Decisions
BPA 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	Lost Time Accident Rates, Days Away Restricted or Transferred, Total Case Rate)

5.0 EXTERNAL AND INTERNAL INFLUENCES

The ability of BPA Facilities to effectively conduct business is largely influenced by the regional market for materials and services of the construction and maintenance industry. BPA Facilities staff are required to maintain technical competence in order to keep pace with the evolution of the construction and maintenance markets, as well as building codes, building technology and industry best practices. To a growing extent, Facilities staff must maintain industry awareness of new project delivery methods, and quickly rising costs of materials, labor and leased office space.

BPA Facilities is migrating to design-build project delivery methods in order to align with industry in order to improve project execution rates, cost effective pricing, quality of work commissioned and execution risk mitigation. Facilities is partnering with Transmission and Supply Chain to develop alternative project delivery methods, to improve project outcomes, improve staff competencies and successfully navigate market pressures within the construction industry.

BPA Facilities is experiencing reduced purchasing power due to historically high material and services inflation from 2020 to 2024, with average costs increasing by ~35%. This challenge occurs across BPA's service territory but is most acute within the greater Portland/Vancouver metro area. However, lease costs remain relatively stable after a 40% increase between 2018 and 2023. Higher costs in the Portland metro area effectively constrain financial resources needed for sustainment and modernization of field facility assets. BPA Facilities will develop multifaceted implementation strategies to flexibly mitigate cost pressures 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 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 a 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.
Changing Environmental Conditions	Changing environmental conditions may impact facilities in several key areas. Design temperatures cannot support actual seasonal temperatures. HVAC and other building systems work beyond normal parameters and lead to early system replacement. 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.
Global Supply Chain	Reverberations from the COVID-19 pandemic and geopolitical strife continue to impact supply chains. Increased costs and limited material

	availability for construction components impact project execution and completion. It is expected that this will continue to be an issue.

Table 5.0-1, External and Internal Influences cont.

Internal Influences	Affects and Actions
Aging asset portfolio may not meet modern codes	Assets may be adaptively reused, and organizations may be relocated with minimal notice in order to address emerging safety, security and operational needs. This presents challenges in mid-term planning for project execution and potentially for occupant/operational safety.
Funding constraints	Escalating costs of lease space, construction, labor and service costs, as well as competing agency priorities, limit funding availability to deliver and execute projects and to keep up with again asset needs.
Staffing levels	Changes to BPA staffing levels and remote/teleworking policies impact the ability to cost effectively provide long-term office space strategies.
Combined responsibility for strategy and execution	Limited BFTE staff manages both the strategic elements of portfolio management and COR duties of project execution. A second level of BFTE PM support is needed to allow resources to specialize and focus on one of these two responsibilities to increase efficiency and quality assurance.
Increased O&M role	If facility O&M shifts to a more centralized model for planning, funding and executing work, a greater resource commitment by BPA Facilities will be required to support the increased O&M span.
Construction and project delivery methods	BPA procurement regulations and delivery methods are challenged to keep pace with the private sector. Supply chain constraints and material shortages require nimble project delivery methods and competent contracting and project staff to keep pace with industry best practices.
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 Contracting Officer knowledge and practices also vary considerably, impacting the amount of work and rework needed for contract development.
Funding allocation	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

The included SWOT table identifies internal strengths and weaknesses of the BPA Facilities program and the external opportunities and threats that influence the program.

Table 5.1-1: SWOT

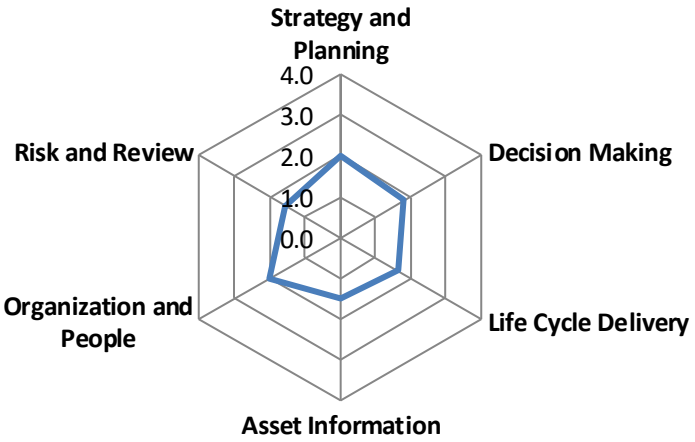
Favorable	*Unfavorable*
Strengths	***Weaknesses***
• Driven workforce with a multitude skillsets and high level of employee engagement. • Ability to effectively and consistently integrate strategic planning, resource management and cost forecasting • Mature asset registry that is comprehensive and updated on a 5-year refresh schedule and as part of project closeouts. • Adopted codes via the 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. • Implementing alternative project delivery methods.	• 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. • Program managers are over capacity and are responsible for more projects than they can reasonably manage.
Opportunities	***Threats***
• Reorganization of workgroup functions of the Facilities Planning and Projects (NWM) team will more effectively distribute asset management, modernization and sustainment activities across staff. • Increased federal workforce in-lieu of contractor support will increase staff effectiveness, efficiency and mitigate staff turnover rate. • 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.	• Escalating operating costs (lease, salary) are forecasted to consume a growing portion of Facilities project expense funding. • Unplanned/tactical O&M actions routinely consume staff time and organizational budget detracting from strategic goals. FY23 saw $2.4M in unplanned maintenance and emerging repairs. • Staff retention across project teams can negatively impact project continuity. 5-year turnover rates (2019 – 2024) are 86% for BFTE and for 92% for CFTE. • 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. • Global and Regional Supply Chain shortages and disruptions. • Material and labor cost escalation remains high (5%) after a ~35% increase from 2020 – 2024.

6.0 ASSET MANAGEMENT CAPABILITIES AND SYSTEM

BPA Facilities' asset management capabilities and systems continue to remain steady with an overall maturity level of 1.7, the same as the 2022 assessment. The program assessment is conducted by the Facilities Planning and Projects supervisor and program managers. Life Cycle Delivery and Asset Information categories remain essentially unchanged while the Organization and People and Risk and Review categories have a slight increase in maturity.

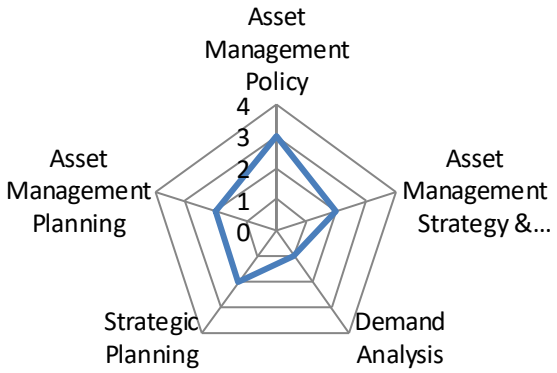
6.1 Current Maturity Level

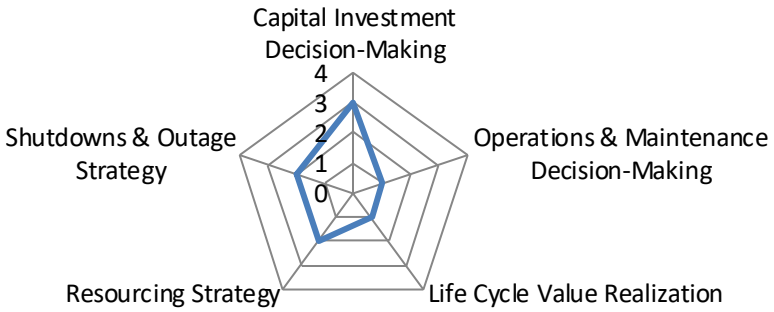
Asset Management Capabilities and Systems average a maturity level of 1.7 across all subject groups in the Institute of Asset Management (IAM) Asset Management Maturity model. The lack of a mature and comprehensive Facilities O&M function, integrated with asset acquisition, renewal, replacement and retirement activities, often limits efforts to mature the facilities asset management system. This often results in a reactive-centered BPA Facilities program that addresses short-term needs rather than the execution of strategic choices and tradeoffs for the best long-term value.



Innocent	Aware	Developing	Competent	Optimising	Excellent
Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Beyond	
The organisation has not recognised the need for this requirement and/ or there is no evidence of commitment to put it in place.	The organisation has identified the need for this requirement, and there is evidence of intent to progress it.	The organisation has identified the means of systematically and consistently achieving the requirements, and can demonstrate that these are being progressed with credible and resourced plans in place.	The organisation can demonstrate that it systematically and consistently achieves relevant requirements set out in ISO 55001.	The organisation can demonstrate that it is systematically and consistently optimising its asset management practice, in line with the organisation's objectives and operating context.	The organisation can demonstrate that it employs the leading practices, and achieves maximum value from the management of its assets, in line with the organisation's objectives and operating context.

Table 6.1-1 Maturity Level

Subject Area	Maturity Level
Strategy & Planning	**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 spending. **Weaknesses:** Planning lacks more robust execution capabilities. Improvement with respect to interagency coordination, more consistent project scheduling and more predictable procurement timelines are needed to enhance the strategic plans. Asset information for demand planning is still being gathered and established. Means for gathering this information is not well established and is needed to achieve a high maturity level. **Strategy and Planning** 
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. Resourcing strategies are established for Capital Investment programs and evolving for O&M projects. **Weaknesses:** 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 fulfill BPA's mission objectives, the tension between short-term and long-term needs dilutes the focus of overall intention of the decision making. Investment decision making is often based more on historical information rather than risk-based prioritization and lacks consistency and transparency. Asset info is in the process of being gathered to inform lifecycle cost analysis of systems and material selection.



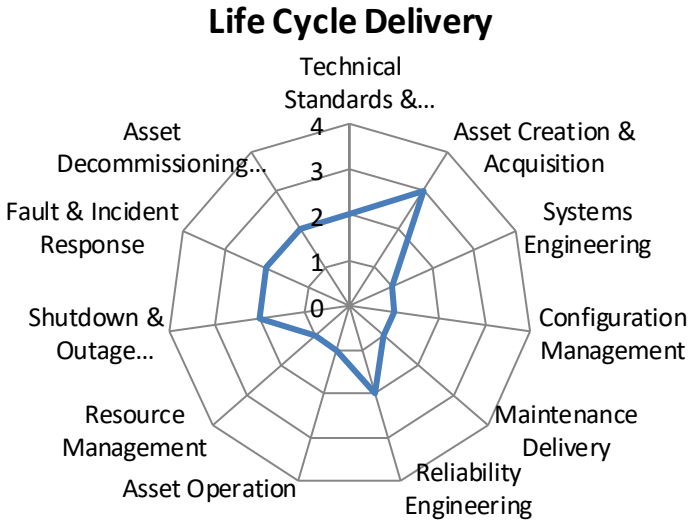
Life Cycle Delivery

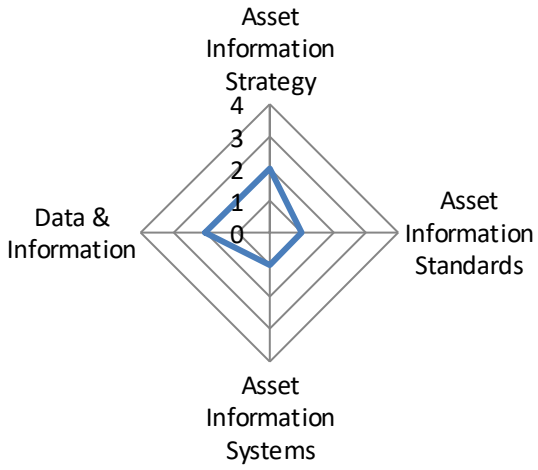
Strengths:

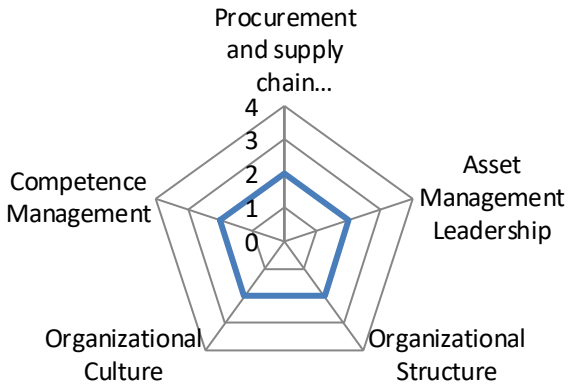
Facilities made solid strides to ensure that project requirements are adequately defined and followed through asset delivery by rigorous quality management plans. This is an ongoing process and there is still room for improvement, but standardization of the scoping/programming phase, implementation of 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 program for facility O&M activities impairs standardization and consistency across the portfolio. Field O&M and HQ/Ross O&M delivery methods and standards differ. 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. Consistent implementation of the established decommissioning and disposal processes is needed to work through the backlog of assets that have reached the end of their useful life.



Asset Information	**Strengths:** Comprehensive asset registry refresh is needed to update portfolio health assessments and to confirm inventory. Condition index is sorted according to building system, asset and campus levels enabling a more programmatic approach for maintaining and replacing assets. Facilities asset registry is tied into RS Means, the largest construction estimating database in the United States, to provide building and system level cost estimates. Progress was made to organize available data to define "success" in project execution and program management. Metric Dashboards are built for future enhancement. **Weaknesses:** 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. There are not well established metrics for measuring the effectiveness of facility program management. **Asset Information** 
Organization & People	**Strengths:** BPA Facilities staff has a wide range of skillsets and high level of engagement. The productivity of staff has remained consistently high. **Weaknesses:** Pronounced staff turnover and workload continue to be a challenge. Contracting 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. Facility projects are executed in partnership with Supply Chain Services and Transmission Engineering. Facility work requires a consistent effort for work which represents a small portion of the organizational 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. Staff retention remains a consistent issue as PgM and PM turnover limits the ability to hold gained ground on strategies and prioritization. Churn slows maturation of the program and diverts focus from high priority planning.



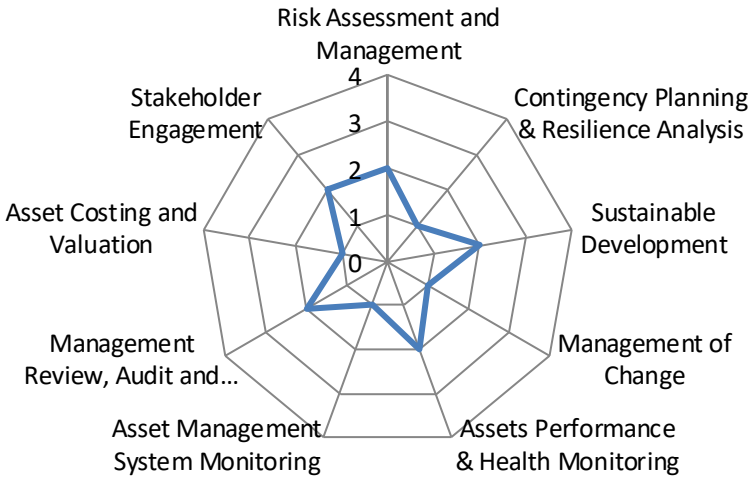
Risk & Review

Strengths:

Stakeholder engagement, particularly with field facilities, is robust. Although priorities are not always aligned, discussions on how best to use resources are regularly held and there is mutual acknowledgement of each party's needs and limitations.

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.



6.2 Long Term Objectives

BPA Facilities strives to achieve an asset maturity level of 2.8 (competent) in Strategy and Planning and Organization and People by the 2027 SAMP. Together, action on these items will improve these key areas which will both serve to guide (Strategy and Planning) and propel (Organization and People) to further asset management maturity. Additionally, BPA Facilities seeks to improve to 1.8 in the areas of Asset Information and Risk and Review. Foundational improvements in these enabling competency areas, through improved asset management information availability and accuracy, will further improve program efforts in the area of risk management and decision making.

OBJECTIVE 1: IMPROVE ASSET MANAGEMENT INFORMATION

Advance Standardization & Integration of Information Management Tools: Standardizing tools supporting asset management processes is an area of continued development. Further integration of various information systems is needed to allow for more informed infrastructure decisions. Standardization in data fields and metrics across multiple platforms will allow staff to identify trends and make risk-informed decisions. As data availability and accuracy improves in BPA 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.

BPA Facilities seeks to directly publish project status reports, execution metrics and risk-informed workplans directly from the Facilitate PgMIS. Additionally, integration of health (FCI) score changes into assessments and reporting will bring more visibility to the long-term trends of the asset portfolio. The following areas of focus will drive future initiatives supporting improved data management capabilities:

Table 6.2-1 Performance Goals

Measure	Objective	Goal
Report Automation	Automate creation of all Facilities status reports by 2025.	Broad disseminations of standardized facilities asset, maintenance and budget status reports within 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	Establish a Data Stewardship Council within the Facilities Asset Category by 2025.	Clarify system ownership, asset values and use required for asset reporting and prioritization.
O&M Informatics Integration	Integrate Computerized Maintenance Management System (CMMS) with all Facilities Operations workflows by 2027.	Improve 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

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: Implementing a system for material and equipment standards across assets will reduce unnecessary overhead and cost for spare parts, training and specialized tools.

Table 6.2-2 Performance Design Goals

Measure	Objective	Goal
Adhere to Baseline Codes for Facilities	Advance building code competencies in facility projects by 2027	Facilities will continue to improve staff competencies in the application of building and safety codes (ICC, NFPA, IAPMO and IEEE) to help ensure that BPA maintains safe assets in alignment with industry best practices.
Service Level Maintenance Standards	Implement service level standards for all major building systems by 2027.	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	Establish standard basis of design for all facility asset categories and systems by 2027.	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

Additional resources will be required to deliver a comprehensive, cradle to grave, asset management program, especially in order to address the Backlog of Maintenance and Repair (BMAR) and increasing day-to-day O&M. Given limited internal O&M resources, BPA relies upon contractors and/or *contracted* services. As such, several high-level and complimentary actions will be assessed as a replacement to general service contracts:

Action 1: Integrated Facilities Management (IFM) contract for base and above base O&M using standard service levels.
Action 2: Expand use of Facilities Portfolio Delivery (FPD) contract to execute 90% of small-to-medium field projects.
Action 3: Expand use of Ross Complex Redevelopment (RCR) contract to execute 90% of projects for the Ross Complex.

Table 6.2-3 Project Delivery Method/Goals

Measure	Objective	Goal
Expand Project Delivery Methods for O&M & Small Construction Projects	Alternate O&M and small project delivery methods in use for 90% of actions by 2027.	Broaden range of project delivery methods to allow for responsive and resource efficient means for executing base O&M and above base (small construction) work. Leverage the IFM contract with implementation of service level standards BPA-wide.
Expand Project Delivery Methods for Medium to Large Design/Construction Projects	Alternate project delivery methods in use for 90% of projects by 2027.	Develop alternative project delivery methods that enable cost-effective and efficient use of resources. Methods include the RCR and FPD contracts.

Staff Competencies

Progress has been made across the BPA in developing asset management skills and competencies. However, the personnel performing facility O&M, energy management, safety (including electrical safety), building performance measures and design functions may lack asset management competencies across many skill areas.

Table 6.2-4 Staff Competency Goals

Measure	Objective	Goal
Define Competency Requirements and Provide Development Opportunities	Standard of practices and competencies for facility practitioners in Portland-Vancouver by 2027.	Develop 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).

6.3 Current Strategies and Initiatives

OBJECTIVE 1: IMPROVE ASSET MANAGEMENT INFORMATION

Initiative 1

PgMIS System Improvements: *Facilitate*, the Facilities program management platform is an ongoing initiative to address the absence of an industry tool to integrate asset registry data, project management data and to enable reporting. Targeted improvements are planned enhance data tracking and report generation, enable earned value analysis and forecasting, improve budgeting and scheduling capabilities and to generate risk profiles at the asset and portfolio levels. BPA Facilities continues to improve informatics capabilities in the areas of data tracking, data standardization with the creation of metric dashboards. Further utilization and integration of these dashboards is a critical next step towards improving asset management information.

OBJECTIVE 2: IMPROVE ASSET MANAGEMENT COMPETENCIES

Initiative 2

Integrated Facility Management (IFM) Contract Implementation: BPA Facilities, in partnership with BPA Supply Chain, seeks to expand the use of the IFM contract in order to reduce the number of unique procurement actions, reduce administrative costs and alleviate project management resource constraints. The next step is to implement this contract for the field which is expected to be complete by 2027.

Additionally, as part of the IFM contract, Facilities will develop comprehensive service level standards for all facility assets. Implementation of maintenance standards for assets maintained by BPA Facilities is an ongoing process. O&M standards for field sites will be rolled out as part of the IFM field contract implementation.

Initiative 3

Facilities Portfolio Delivery (FPD) Contract Implementation: Another goal to improve asset management competencies is to expand the use of alternate project delivery methods. Additional project delivery methods will allow the portfolio to increase capacity and project throughput that is needed to reduce the BMAR. This initiative also compliments Long-term Objective 3 by providing a path to execute medium to large sized design and/or construction projects. The components that make up the FPD are an Owner's Consultant (OC) contract and a Progressive Design-Builder (PDB) contract.

6.4 Resource Requirements

In order to accomplish objectives 1 and 2 staffing resources will be needed to support the above initiatives. To support long-term objective 1, a staff member will be needed to further develop the metrics dashboard that integrates with the PgMIS (Facilitate). Additional staff resources will be required to provide QA/QC. Objective 2 will require multiple staff member's time that includes both employees and supervisors. Staff will need to draft the procedures, provide QA/QC, and perform reviews and approvals.

Objective 3 will require both staffing resources and financial resources. Additional BFTE staff will be needed to implement and maintain the contracts, coordinate with the external business partners, provide QA/QC and provide approvals or modifications. Financial resources will be needed to support these various contracts and fund the projects being delivered by the external business partners.

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 to the assets importance in supporting or maintaining the Bulk Electric System:

- **Mission Critical:** Facilities having a direct and significant impact on Bulk Electric System operations.
- **Mission Essential:** Energized facilities and backup power systems that provide for substations.
- **Primary Support Facilities:** Facilities supporting day-to-day operations and maintenance.
- **Secondary Support Facilities:** Facilities supporting activities for routine O&M, training and research.
- **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 an effort 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 By 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 a facility 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. Assets are grouped into criticality levels in Table 7.1-1 shown above. The Transmission Substation Reliability Level, shown in Table 7.1-2, is an additional ranking that factored in at the two highest asset criticality levels. This combined priority translates into a criticality score

at the project level for rating and ranking for proposed work; more critical facilities and building systems rank higher than those that are less critical. Annual workplans contain project priority rankings of the highest (1) to lowest priority.

Table 7.1-2: Transmission Substation Reliability Level

		REALIBILITY	REALIBILITY	REALIBILITY
	Impact Level	The potential impact of a risk even on service or grid reliability.	The potential impact of a risk even on service or grid reliability.	Transmission Curtailments
7	**Catastrophic**	Outage resulting in > 20 million total customer hours of interruption.	Uncontrolled Break up of WECC Interconnection or NW Blackout	
6	**Severe**	Outage resulting in ≥ 2 million total customer hours of interruption.	Load loss of > 1000 MW (PDX or SET single load center loss, or Spokane + Tri Cities + Olympic)	Loss of southern Intertie, Curtailments > 3,000-5,000 MW Loss
5	**Extensive**	Outage resulting in ≥ 200,000 total customer hours of interruption.	Load loss of 500 MW to 1000MW	Curtailment of Firm Service, 2000-3000 MW Loss
4	**Major**	Outage resulting in ≥ 20,000 total customer hours of interruption.	Load loss of 200 to 500 MW	Curtailment of Firm Service, 500-2000 MW
3	**Moderate**	Outage resulting in ≥ 2,000 total customer hours of interruption.	Load loss of 75 to 300 MW	Non-Firm
2	**Minor**	Outage resulting in ≥ 200 total customer hours of interruption.	Load loss of 10-75 MW	Non-Firm
1	**Negligible**	Outage resulting in <200 total customer hours of interruption.	Load loss of 1-10 MW	Non-Firm

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 broader 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 7.1-3, Building System Types & Criticality

		SYSTEM TYPE							
CATEGORY		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 7.1-4, 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	-
	A20 Basement Construction	Life of Building	-
B SHELL	B10 Superstructure	Life of Building	-
	B20 Exterior Enclosure	20	-
	B30 Roofing	20	-
C INTERIORS	C10 Interior Construction	25	-
	C20 Stairs	Life of Building	-
	C30 Interior Finishes	20	-
D SERVICES	D10 Conveying	40	Varies by service contract
	D20 Plumbing	50	-
	D30 HVAC	15	Varies by service contract
	D40 Fire Protection	15	Varies by service contract
	D50 Electrical	Life of Building	-
E EQUIPMENT & FURNISHINGS	E10 Equipment	Life of Building	-
	E20 Furnishings	10	-
F SPECIAL CONSTRUCTION & DEMOLITION	F10 Special Construction	Life of Building	-
	F20 Selective Building Demolition	Life of Building	-
G SITEWORK	G Sitework – Building Related	Life of Building	-
	G Other Sitework – Project Related	Life of Building	-

The process of establishing comprehensive maintenance and service level standards for all Facilities assets is in development as part of Initiative 3 outlined in the previous section. As standards are set for assets and associated components this table will be updated and performance tracked.

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 Managers manually create 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). The BPA Facilities overall work plan priority list is revisited periodically throughout the year and unplanned O&M projects are added for completion or tracking into the next cycle.

8.0 CURRENT STATE

8.1 Historical Costs

BPA Facilities historical costs and approved rate case costs are shown in the table below. These figures provide a view into the 5-year historical spend fluctuations by funding type. Execution rate variations are related to COVID-19 pandemic moratoriums (2020 – 2022), varying project levels each year, and high staff turnover, particularly on expense. Historical 5-year program execution rates are 60% for capital and 80% for expense.

Table 8.1-1 Historical Expenditure,

Facilities	Historical Spend (in thousands) with Current Rate Case						
						Current Forecast or Rate Case	
Capital (CapEx)	2019	2020	2021	2022	2023	2024	2025
CIR/IPR Allocation	$35,166	$29,646	$23,254	$53,200	$56,200	$106,000	$87,800
Budget Carryover	$0	$0	$0	($13,250)	$13,250	($42,500)	$42,500
Capital OY	$35,166	$29,344	$8,300	$39,950	$69,450	$63,500	$103,300
Total (Actuals)	**$18,814**	**$6,419**	**$3,282**	**$39,701**	**$43,862**	*$63,500*	*$103,300*

*Expense (OpEx)	2019	2020	2021	2022	2023	2024	2025
O&M SOY	$14,757	$14,341	$14,009	$14,700	$14,700	$15,300	$15,500
Budget Adjustment	$0	($37)	$0	($5,125)	($5,653)	($71)	$0
O&M OY	$14,757	$14,304	$14,009	$9,575	$9,047	$15,229	$15,500
Total (Actuals)	**$14,998**	**$9,387**	**$11,408**	**$12,297**	**$7,988**	*$15,229*	*$15,500*

*Note: Expense budget for NWM budget only (with staff) and doesn't include NWF, TF components

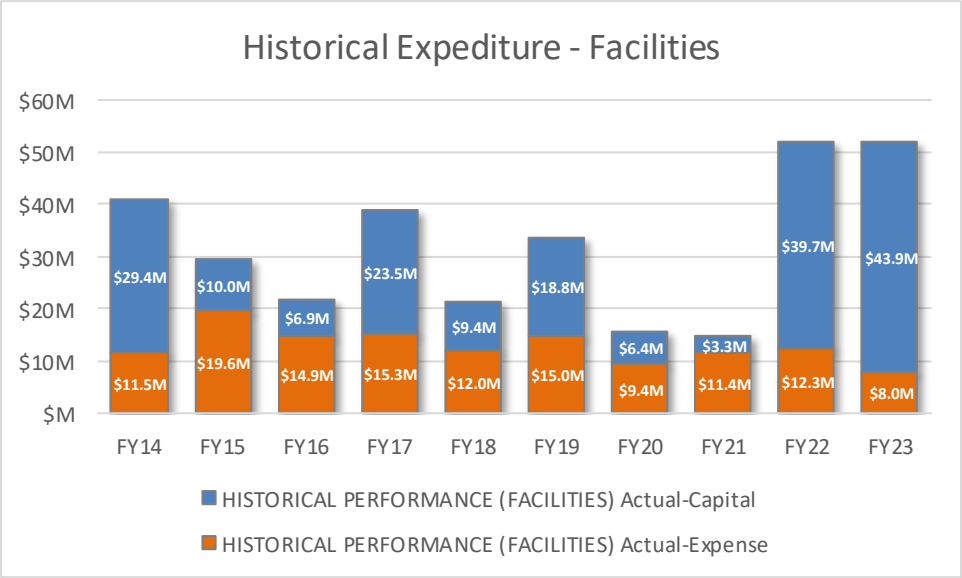


Figure 8.1-2 Historical Expenditures, Facilities

Investment Priorities:

BPA Facilities seeks to balance planned improvements (capital replacements and expense lifecycle system replacements) with increased reactive O&M actions required to maintain site operability and safety standards. BPA Facilities capital program historically executes one facility replacement project every two years, however, a new progressive-design-build delivery model enables an average of one facility replacement project every year. BPA Facilities expense program executes an average of 40 planned/reactive O&M projects per year over the past 10 years. More recently, expense execution is reduced to 25 projects per year as project costs increase due to inflation and the number of reactive O&M requests increase. Reactive O&M accounts for a large portion of the expense expenditures and projects, which results in limited resources to perform both capital (lifecycle replacements) and expense (lifecycle system replacements/upgrades).

Major actions impacting the historical spend profile:

- Maintenance Headquarters (MHQ) (*Criticality 3*) replacements are historically the largest asset replacement program. Current investments at Ross Complex, like the Vancouver Control Center (Criticality 1) and the Chemistry/Calibration Lab (Criticality 4), represent the majority of capital forecasts through FY28 with capital forecast returning to Criticality 3 (MHQ) replacements.
- *Criticality 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 asset creation, replacement and retirement of control houses and microwave radio buildings (*Criticality 2*) are funded and executed by Transmission Services based upon system requirements. BPA Facilities is responsible for the lifecycle replacement of building system and maintenance of Criticality 2 assets, which is reflected in *Figure 8.1-1*. The resulting total BPA facility cost data does not fully account for all lifecycle activities of Criticality 2 assets.

8.2 Historical Asset Sustain Trends vs Forecast

A is experiencing an average 35% construction cost increase that ranges from 18% to 110% depending on the project parameters. Furthermore, increased material lead times result in increases from 39% to 305%.

BPA backlog of maintenance and repairs (BMAR) is over $717M, which represents a portfolio Facility Condition Index (FCI) rating of 0.44. Facilities FCI reflects the serious condition of many assets, which require major renovation or replacement.

BPA Facilities is forecasting the following trends:

- Serious condition rating of portfolio assets represents an increased risk to grid reliability;
- Facility conditions will continue to decline with expected increased rates of system failures at Crit. 2/3 assets;
- Weather extremes will create additional pressure on the performance of aged assets and systems;
- Premature system failures will increase replacement costs and increase needs for reactive O&M;
- Reactive O&M will increasingly draw from resources required for planned O&M replacement projects;
- Reduced planned O&M replacement capacity will result in increased BMAR and higher long-term costs; and
- Material, labor and contract inflation will continue at 4.5% per year.

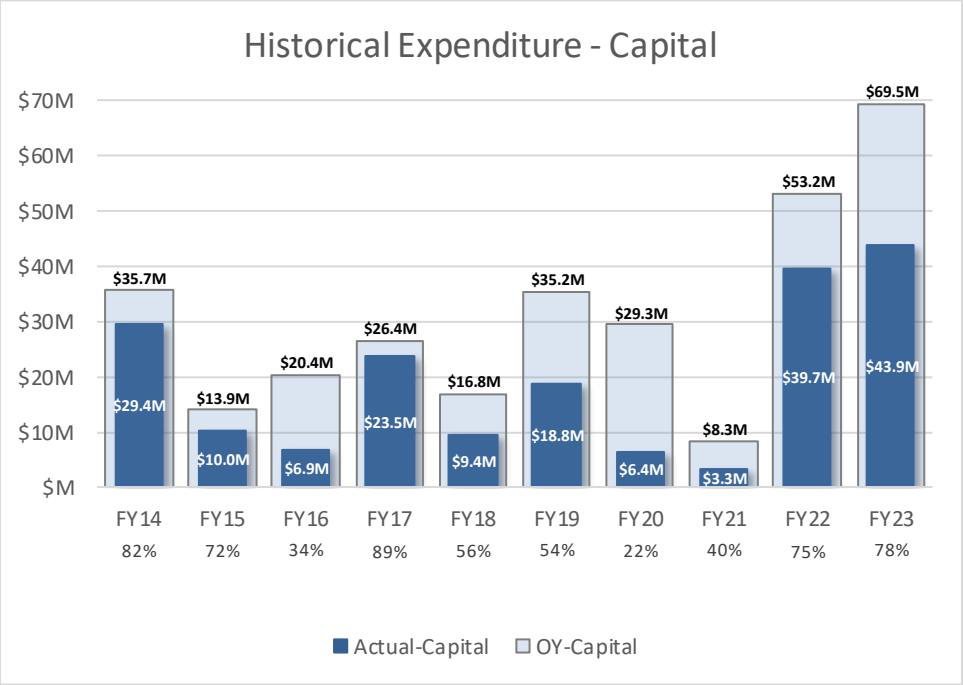


Figure 8.2-1 Historical Expenditure, Capital

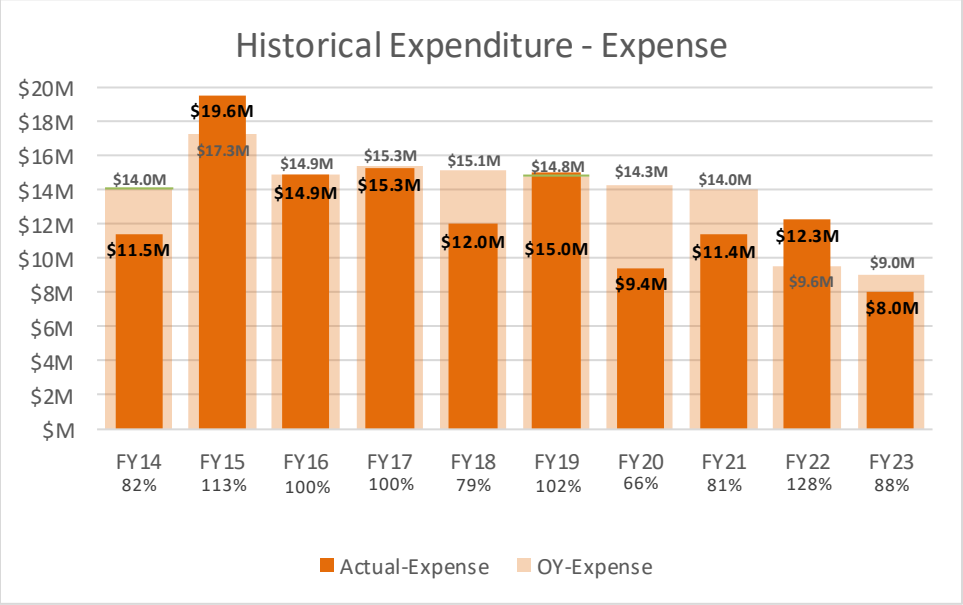


Figure 8.2-2 Historical Expenditure, Expense

8.3 Asset Condition and Trends

Facilities assets average 44 years old, and require elevated levels of maintenance and replacement. Facilities is experiencing increased premature assets/systems failures due to deferred routine maintenance, increased heat loads from technology upgrades, and increased temperature extremes from major weather events. While BPA Facilities established performance measurements and objectives for Criticality 1 assets, but has not extended those criteria for the

remainder of Criticality 2-5 assets. Many industry benchmarks for facility asset health have limited relevance to BPA's business environment. BPA Facilities proposes performance metrics to focus on three key objectives: critical facilities reliability, cost management and environmental stewardship. Historical data is incomplete, but is actively being gathered.

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, FCI helps to enable informed decisions in forecasting budgets 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 8.3-3, Asset Condition (FCI)

Assets/Systems	Asset Condition (FCI)	Current Performance
Criticality 1	0.43	Critical
Criticality 2	0.47	Critical
Criticality 3	0.42	Critical
Criticality 4	0.42	Critical
Criticality 5	0.26	Poor

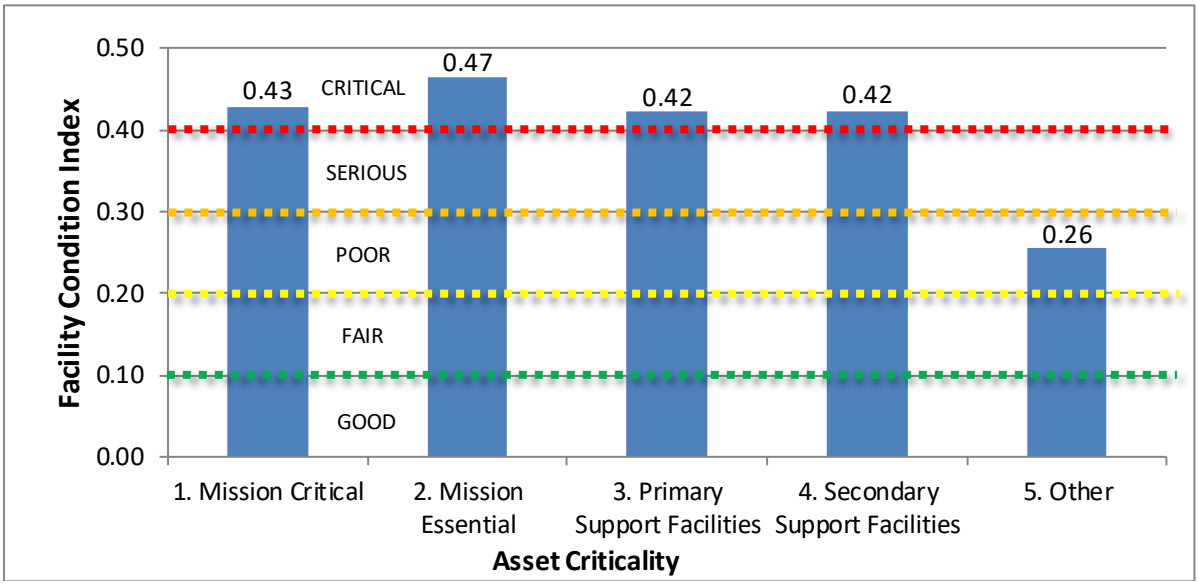


Figure 8.3-3, Asset Condition (FCI) by Criticality Level

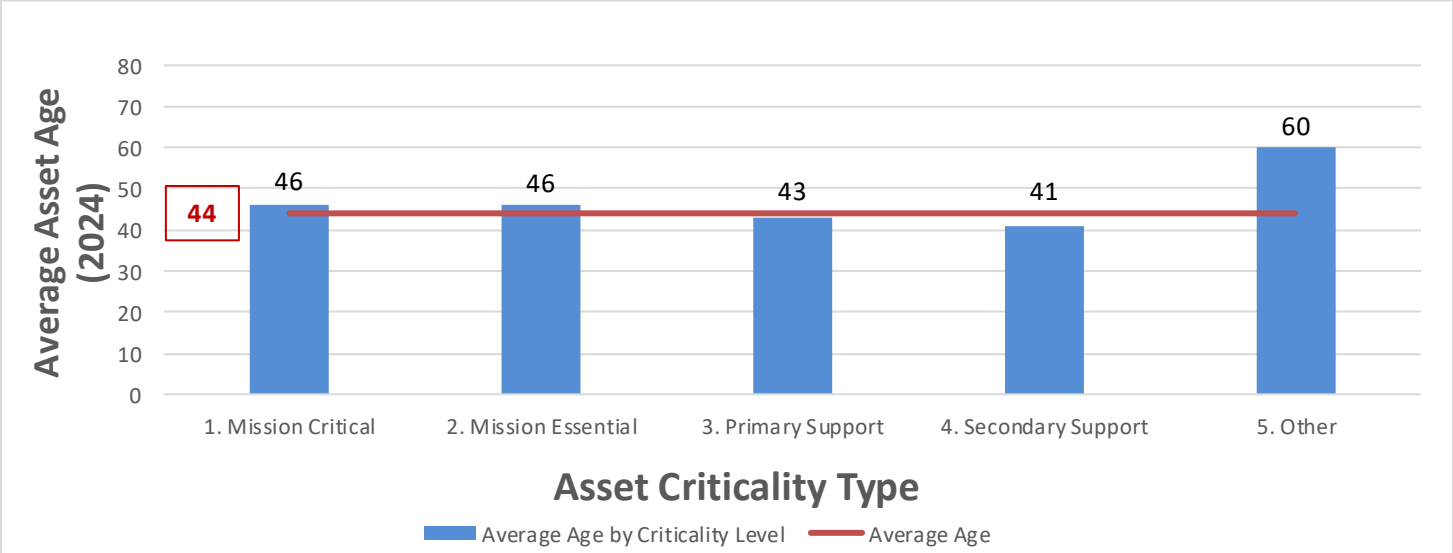


Figure 8.3-1, Asset Age by Criticality

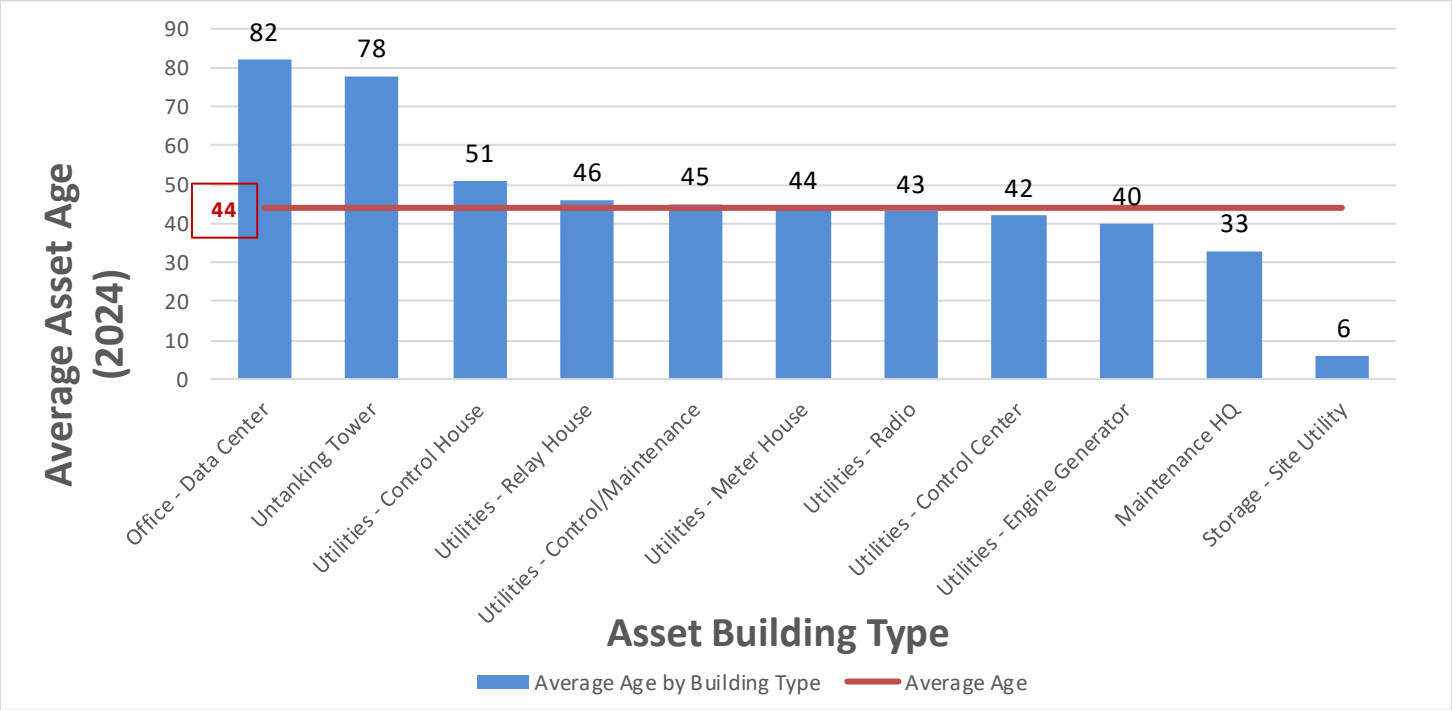


Figure 8.3-2, Asset Age by Building Type

8.4 Asset Performance

BPA Facilities measures asset performance by tracking the following:

- Critical facilities building systems uptime;
- Reactive maintenance to planned maintenance;
- Asset utilization of office space; and
- Utilities consumption of facilities.

Table 8.4-1 Asset Performance Summary

Strategic Goal	Objective	Measure	Units	2019	2020	2021	2022	2023
Maintain acceptable critical facilities system uptime	Reliability	% uptime and # of Tasset failures for MEP systems	% & #	-	-	100%, 0	100%, 0	100%, 0
Optimize O&M and Lifecycle Planning	Financial	% unplanned work to total work preformed	%	17%	23%	26%	29%	44%
Maximize Asset Utilization	Financial	Building utilization as a % of capacity	%	78%	77%	77%	75%	76%
Reduce Utility Consumption	Environmental	Resource benchmark to industry	$ & #	-	-	-	-	-

Performance Measurements:

- ***Critical Facility building systems uptime: Criticality 1 asset uptime without planned outages.*** *Criticality 1 assets are being managed effectively to prevent unplanned outages.*
- ***Reactive Maintenance: Efficiency of O&M to prevent unplanned repairs at Criticality 1-3 assets.*** *Unplanned outages at facilities are increasing due to critical facility conditions.*
- ***Office space Utilization: Efficiency of Space Planning to cost-effectively manage Criticality 3 Assets.*** *Criticality 3 office spaces in the Portland/Vancouver metro area are steadily utilized.*
- ***Utilities consumption: Efficiency of Criticality 1-3 assets measured by resource consumption.*** *Measurement of major facilities with utility meters is tracked and will be integrated in the future.*

8.5 Performance and Practices Benchmarking

Benchmarking of BPA Facilities portfolio is measured against industry accepted standards. Additional outreach and trending is planned to commence 2025 – 2025. Benchmarking activities align with SAMP objectives outlined in Section 3.

- Association of Physical Plant Administrators (APPA)
- American Public Works Association (APWA)
- Building Owners and Managers Association (BOMA)
- Design Build Institute of America (DBIA)
- Institute of Asset Management (IAM)
- International Facilities Management Association (IFMA)
- North American Transmission Forum (NATF)

BPA Facilities participates in member surveys on topics relating to the professional practices of design, construction, cost estimation, facilities management and space management.

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 the project level.

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, OHSA requirements, and building codes.
- **Reliability:** Risks that lead to break-downs in the operations of people, processes and 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 23.

Each building system was assessed for contributions 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 1 building system corresponds to an impact deemed "extreme," whereas a Criticality 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 Figure 8.3-3 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 estimated useful life (EUL) 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.

For the following heat maps, the problem areas are in the upper right quadrant, which represents the highest impact and probability of failures and contains the building systems most needing attention. Further analysis shows problematic building systems by risk in figures below. Representative projects are included for clarity of what would typically be included in workplans to mitigate building system failure risks.

Table 9.0-1.A, 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 changing 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 building to higher performance level.
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 Managers in accordance with strategic objectives, the Asset Management Plan, and other factors.

Table 9.0-1.B, Building System Risk Analysis

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

Safety Risk of Building Systems

Likelihood	Insignificant	Minor	Moderate	Major	Extreme
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

Consequence

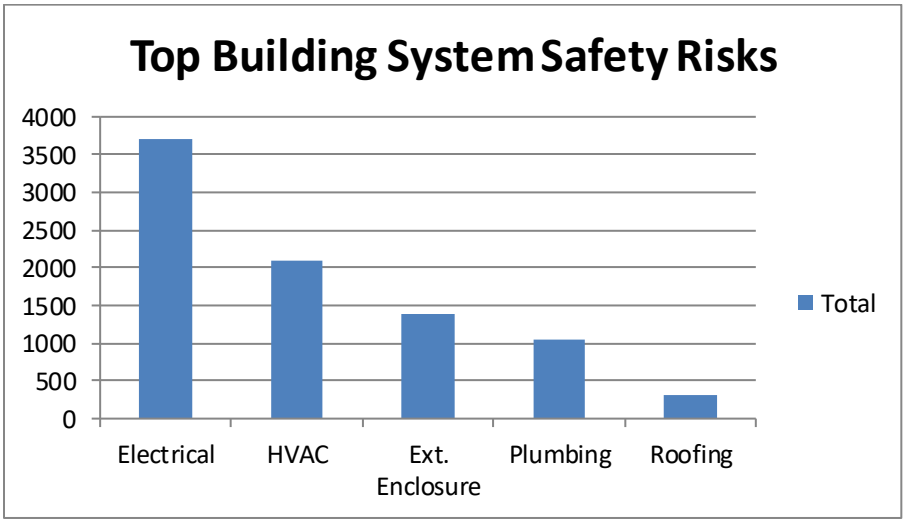


Figure 9.0-1, Risk Assessment, Safety

Reliability Risk of Building Systems

Likelihood	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

Consequence

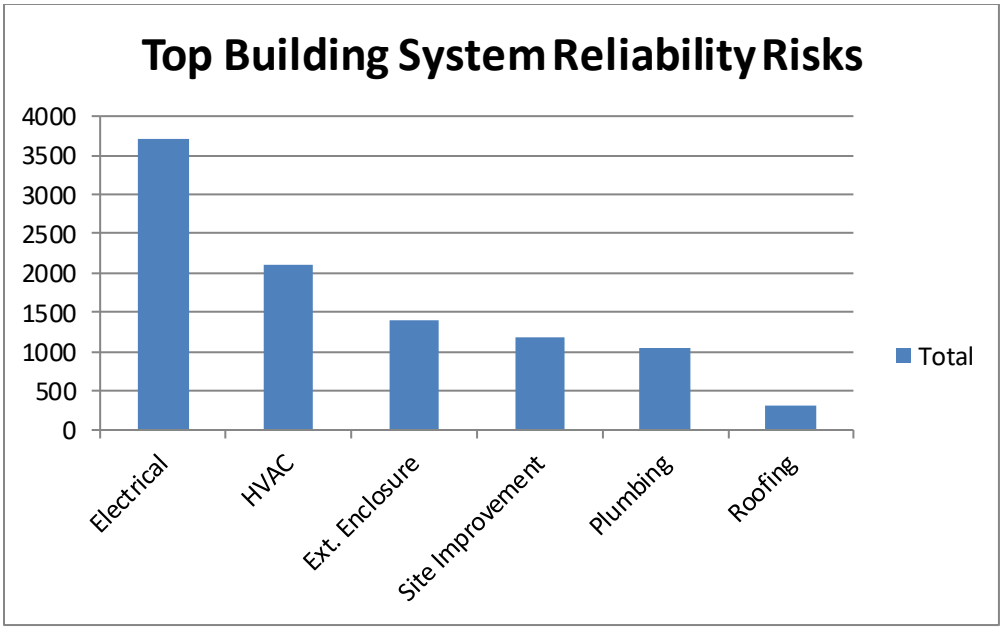
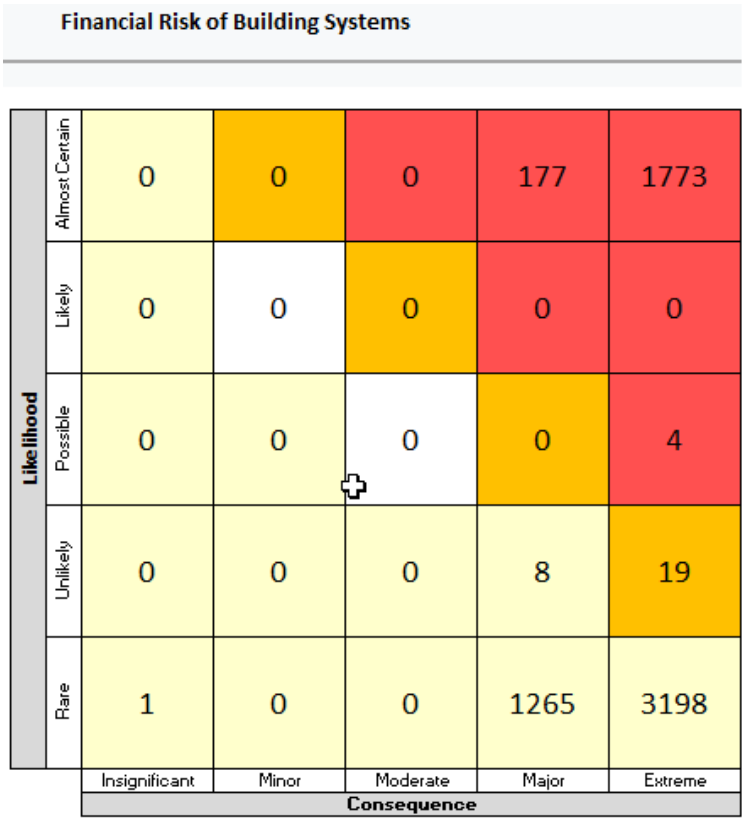


Figure 9.0-2, Risk Assessment, Reliability



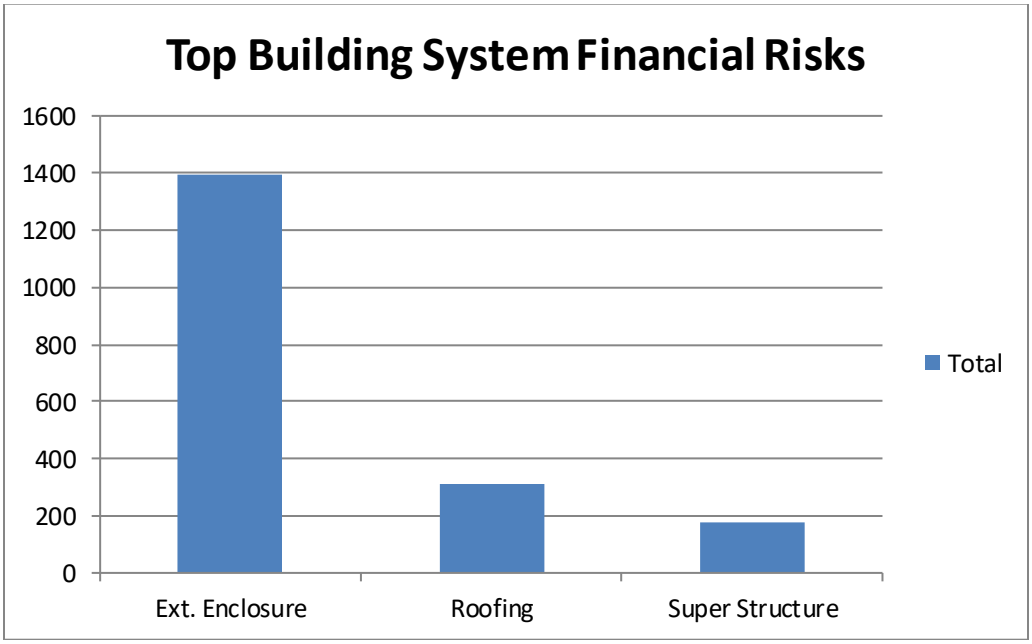
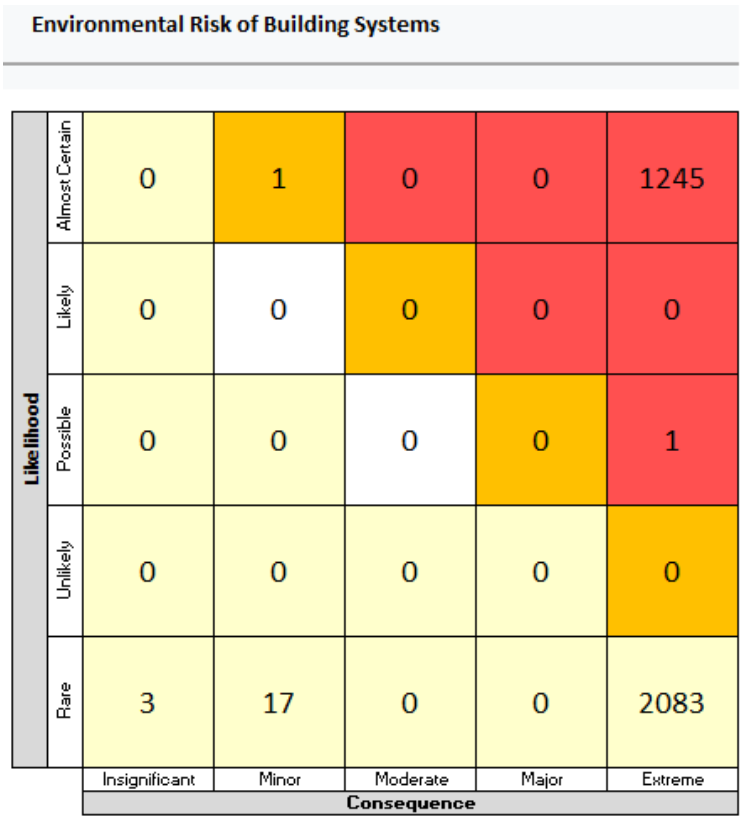


Figure 9.0-3 Risk Assessment, Financial



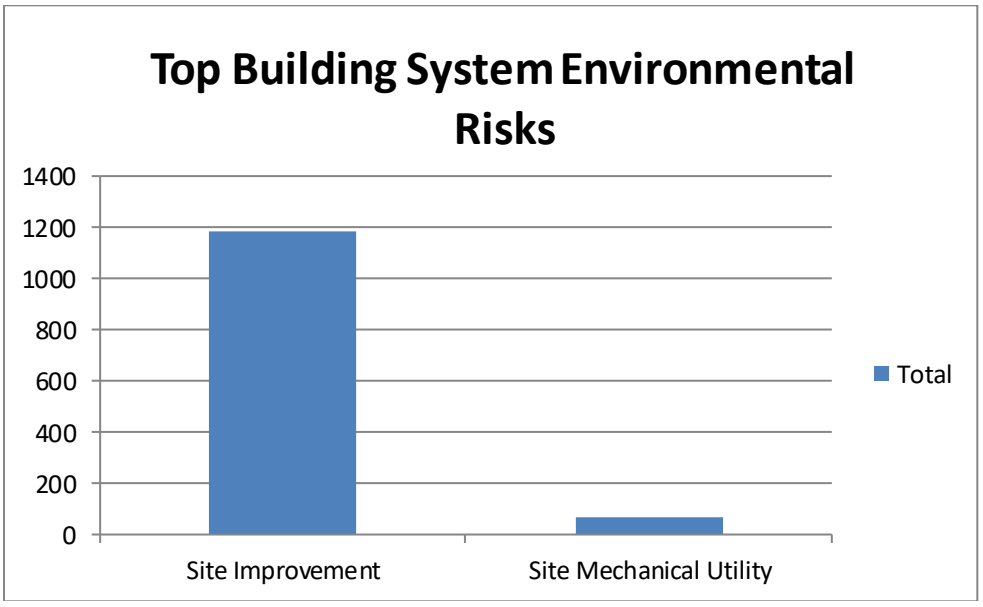
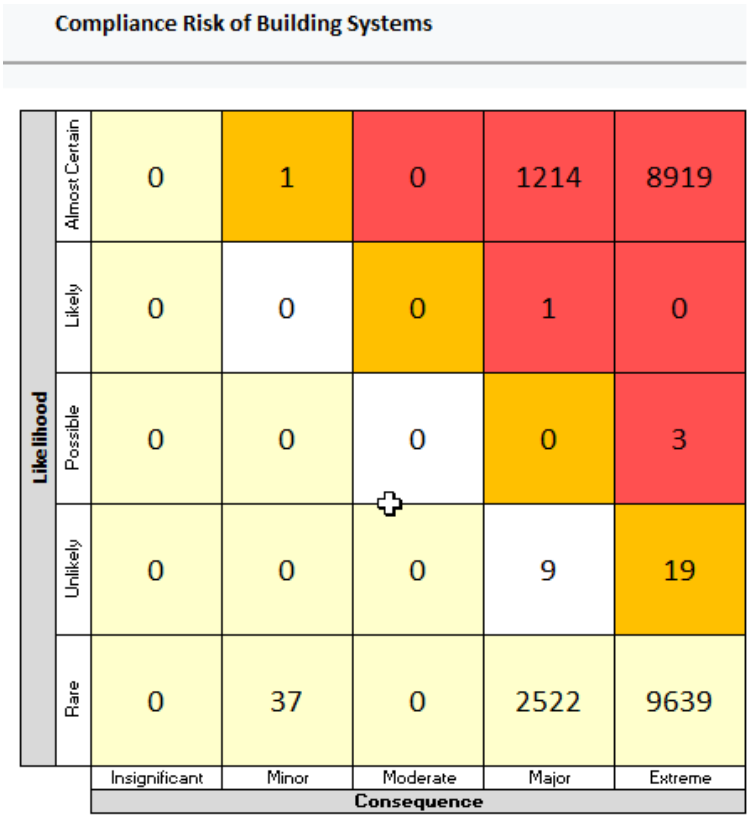


Figure 9.0-4, Risk Assessment, Environment/Trustworthy/Stewardship



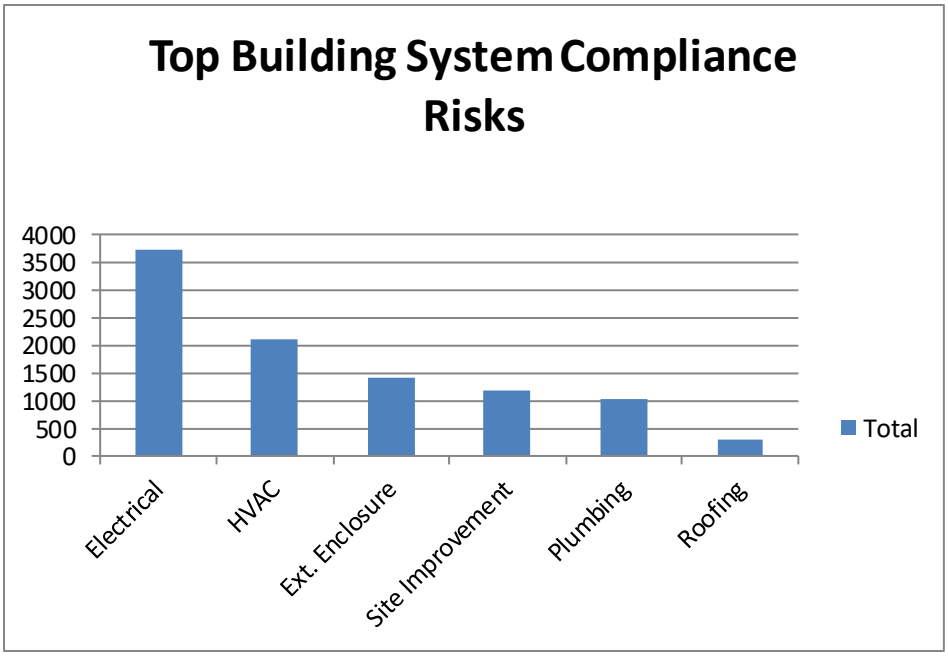


Figure 9.0-5, Risk Assessment, Compliance

10.0 STRATEGY AND FUTURE STATE

BPA Facilities assumes future expense funding will be in line with present levels while capital funding will increase in the short term to support the replacement of the Dittmer Control Center and then return to an inflation adjusted average. Facilities has embarked on a number of initiatives which will provide incremental improvement to our cost management and execution capabilities to account for reduced (when adjusted for inflation) expense funding. 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 allocated to address all asset degradation levels. The current environment dictates that Facilities prioritizes investments according to mission criticality and transmission site reliability scores and that the organization continue to identify opportunities for greater program efficiency, increased resources, 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.

Table 10.1-1 Future Asset Performance Objectives

Objective	This Year	Year +1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Reliability: Maintain critical facilities system uptime	< 1% downtime, CL 1 assets	< 9 asset failures, CL 2 assets	< 8 asset failures, CL 2 assets	< 7 asset failures, CL 2 assets	< 6 asset failures, CL 2 assets	< 5 asset failures, CL 2 assets	< 4 asset failures, CL 2 assets	< 3 asset failures, CL 2 assets	< 2 asset failures, CL 2 assets	< 1 asset failures, CL 2 assets	< 1 asset failures, CL 2 assets
Financial: Optimize O&M and lifecycle planning	< 30% reactive work (metro)	< 60% reactive work (field)	< 20% reactive work (metro)	< 50% reactive work (field)	< 10% reactive work (metro)	< 40% reactive work (field)	< 10% reactive work (metro)	< 30% reactive work (field)	< 30% reactive work (metro)	< 20% reactive work (field)	< 10% reactive work (metro)
Financial: Maximize asset utilization	Metro utilization at 75%	Reduce lease space by 10%	Metro utilization at 80%	Metro utilization at 85%	Reduce lease space by 30%	Metro utilization at 90%	Metro utilization at 90%	Reduce lease space by 50%	Metro utilization at 90%	Maintain amount of lease space	Metro utilization at 90%
Environmental: Reduce utility consumption	Meter two additional sites	Meter two additional sites	Meter two additional sites	Meter three additional sites	Meter three additional sites	Meter three additional sites	Meter four additional sites	Meter four additional sites	Meter four additional sites	Meter five additional sites	Meter five additional sites

10.2 Strategy

Strategy 1: Prioritized Asset Investment

The BPA Facilities organization facilitates 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 1, 2 and 3 assets) with the highest site reliability score. Criticality 1 and 2, e.g., control centers and substation control houses, are integral to the operation of the Bulk Electric System however they do not all have the same impacts on the reliability of the grid so the site reliability score will be added as a modifier to these asset categories to reflect that level of importance. Asset Critically 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 and minimal investment for asset Criticality 4 and 5, e.g., storage and training buildings, due to their low impact to ongoing mission operations. Improvements to asset Criticality 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 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 using industry standards, thereby enabling competitive pricing from vendor pools and (3) maximize utilization of BPAs office footprint.

- Reduce administrative burden and project life cycle duration: The implementation of the Integrated Facility Management (IFM) contract into the field and the upcoming Facilities Portfolio Delivery (FPD) Contracts 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 continues to utilize CM/GC for capital renewals and has expanded the use of progressive design-build delivery methods for capital replacements and expense funded projects that target O&M and the renew/renovate asset lifecycles
- 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 completed for the Ross Complex, Starr (Celilo), Covington and Bell Complexes. An SFG is scheduled for the Grand Coulee Complex in FY24.
- 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 the 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; and
- 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. Integration of the IFM and FPD delivery models for this investment category will be a key factor in a achieving a successful program.

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 Criticality 1, 2 and 3 assets, however under further review the removal of Criticality 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 asset. 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 strategy 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, Facilities 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 such is the case with the Dittmer Control Center replacement. Typical facility expansion projects are supported by financial, mission, and safety drivers, which include new office development in lieu of continued lease, new control center development to meet changing mission, security, capacity, safety, regulatory, and capability requirements and MHQ development to replace field lease facilities and assets beyond their useful lifespan. 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 Business 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, safety, 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.

Adaptability:
Facility investments must be able to accommodate mission changes over the cores of their lifecycle to retain value and support the activities of our workforce. Due to this facility designs need to have flexible floor plans and supporting infrastructure that can accommodate changes in use and occupancy in the future. Additionally, this site selection of new assets should be informed by long term planning studies and zoning use cases to ensure assets promote current and future work flow adjacencies.

Safety:
Safety by design is a core principle in everything we do at BPA. This holds true for facilities design where all decisions are framed in the context of how they support the safe and efficient operations through the lifespan of an asset. Specific area of focus include the separation of pedestrian and vehicle access, security risk assessments of all new facilities, adherence to current life safety requirements, and considerations for safety O&M activities such as fall protection and clearances around equipment.

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 Code 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.

Technological Change:
The facilities portfolio has embarked on an ambitious program to replace the Dittmer Control Center with the Vancouver Control Center (VCC) facility, intended to be completed by end of fiscal year 2028. The new VCC represents major technological changes for the agency by enhancing Power and Transmission system operations, improving Continuity of Operations (COOP), consolidating data centers, fortifying fiber loops and also enabling future mission capabilities. The

VCC will also reduce risks by having a seismic risk category 4 design, be compliant with BPA code policy and promote safety by design components and conform to uptime institute tier standards for control centers.

10.3 Planned Future Investments/Spend Levels

The Facilities capital program requires average of $162.9M per year for the BP-26 IPR rate period (FY26 – FY28) and an average of $69.8M per year for FY26-FY35. Expenditures increase in FY26 – FY28 to address capital expand control center replacement and then return back to a historically more typical level of spend adjusted for inflation. FY28 and beyond returns focus to the MHQ replacement capital sustain program after the new control center investment.

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. BPA Facilities portfolio replacement value of $1.63B necessitates an annual capital renewal target of $33M to $65M for replacement and retirement of assets and annual expense renovation target of $33M to $65M for maintenance and repair activities. Currently, BPA Facilities are funded below the industry standard levels.

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 "critical" condition (FCI 0.40 to 0.39). Additionally, the industry standard funding levels defined above represent direct actual construction costs only, whereas forecasted expense levels are inclusive of administrative costs for labor, which renders expense program budgets effectively 25% less with the overhead burden.

Table 10.3-1 Optimal Future Expenditures (in thousands)

Facilities	Rate Case FY's			Future Fiscal Years						
Capital (CapEx)	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Expand	166,800	146,000	38,400	4,900	4,900	0	0	0	0	0
Sustain	43,400	59,400	34,700	32,700	32,700	34,400	34,500	35,900	38,400	39,900
Total Capital	**210,200**	**205,400**	**73,100**	**37,600**	**37,600**	**34,400**	**34,500**	**35,900**	**38,400**	**39,900**
Expense (OpEx)										
Facilities Expense (L4-1059/5023/5024)	42,134	48,637	50,156	47,263	48,863	50,172	53,937	54,562	55,284	56,984
Mature Asset Prioritization Program Support	306	315	324	334	344	354	365	376	387	399
Transmission Evolving Grid Program Support	292	300	309	319	328	338	348	359	369	380
Expand Capital-related Expense, Grand Coulee O&M	1,100	1,180	1,260	1,340	1,420	1,500	1,580	1,660	1,740	1,820
Total Expense	**43,832**	**50,432**	**52,049**	**49,256**	**50,955**	**52,364**	**56,230**	**56,957**	**57,780**	**59,583**

*Note: Light blue (aqua) cells reflect variations from Expected forecast.

The optimal future spend forecast for capital includes:

- Increase of 8% in total Sustain capital for FY29 and beyond to enable facility renewals; and
- Increase of 2% in total Sustain capital for FY29 and beyond to enable additional retirement/abatement.

The optimal future spend forecast for expense includes:

- Increased expense to support Environmental Management and Compliance programs;
- Increased expense for services to support increased Transmission staff for Evolving Grid; and
- Increased expense to support continued O&M for Expand capital acquisition of Grand Coulee.

Note: Reductions in optimal capital funding in FY29 and beyond will result in continued degradation of building systems due to lack of renewal. Reductions in optimal expense funding levels will result in direct reductions to support for Environmental Management and O&M for the Grand Coulee Expand capital acquisition.

Table 10.3-2a Expected Future Expenditures by Funding Type (in thousands of $)

Program	Rate Case FY			Future Fiscal Years						
Capital Expand (L4-1038)	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Acquisition-System Replace(NWM)	0	0	2,400	4,900	4,900	0	0	0	0	0
Acquisition-Bldg. Replace (NWM)	166,800	146,000	36,000	0	0	0	0	0	0	0
Total Capital Expand	**166,800**	**146,000**	**38,400**	**4,900**	**4,900**	**0**	**0**	**0**	**0**	**0**
Capital Sustain (L4-1036)										
Acquisition-General Replace (NWM)	16,800	200	3,500	0	0	0	0	0	0	0
Acquisition-MHQ Replace (NWM)	25,700	56,800	27,500	27,900	22,700	24,700	27,500	32,600	34,900	36,300
Demolition-Abate/Retire (NWM)	900	2,400	3,700	1,800	7,200	6,600	3,900	0	0	0
Total Capital Sustain	**43,400**	**59,400**	**34,700**	**29,700**	**27,900**	**31,300**	**31,400**	**32,600**	**34,900**	**36,300**
Total Facilities Capital	**210,200**	**205,400**	**73,100**	**34,600**	**34,800**	**31,300**	**31,400**	**32,600**	**34,900**	**36,300**

Program	Rate Case FY			Future Fiscal Years						
Expense (L4-1059)	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Acquisition-Cap. Expense (NWM)	2,723	7,550	6,550	2,200	2,350	2,100	4,200	3,700	2,390	2,500
O&M-Projects (NWM)	17,203	17,978	18,787	19,600	20,500	21,400	22,400	23,400	24,400	25,500
O&M-Service & Repairs (NWF)	7,095	7,294	8,113	8,357	8,607	8,866	9,131	9,256	9,688	9,978
O&M-Repairs (TF)	7,503	7,915	8,406	8,406	8,406	8,406	8,406	8,406	8,406	8,406
Sub-Total Expense	**34,524**	**40,737**	**41,856**	**38,563**	**39,863**	**40,772**	**44,137**	**44,762**	**44,884**	**46,384**
Expense (L4-5023/5024)										
O&M-Service & Repairs (NWF)	7,610	7,900	8,300	8,700	9,000	9,400	9,800	9,800	10,400	10,600
Total Facilities Expense	**42,134**	**48,637**	**50,156**	**47,263**	**48,863**	**50,172**	**53,937**	**54,562**	**55,284**	**56,984**

Table 10.3-2b Expected Future Lease, Utilities & Service Contract Expenditures (in thousands of $)

Program	Rate Case FY			Future Fiscal Years						
Expense (Leases/Util/Service)	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
O&M-Lease (Corp-NWF) (L4-1550)	18,100	18,700	19,300	20,000	20,700	21,400	22,100	22,800	23,500	24,200
O&M-Util/Serv. (Corp-NWF) (L4-5025)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total Lease Expense	**19,100**	**19,700**	**20,300**	**21,000**	**21,700**	**22,400**	**23,100**	**23,800**	**24,500**	**25,200**

The expected future spend forecast for capital includes:

- Approved forecast for the Vancouver Control Center (FY24 – FY28);
- Expand capital to support Transmission acquisition of Grand Coulee Asset Acquisition (FY25 – FY27);
- Sustain capital to support Maintenance Headquarters replacements (FY25 and beyond);

The expected future spend forecast for expense includes:

- Inflation adjustment (35%), beginning in FY26, for realized construction inflation;
- Annual inflation adjustment of 4.5% per year beginning FY26 to align with construction industry forecast;
- Support for Expand capital investment for Vancouver Control Center in FY27 – FY28;
- System replacements in support of Expand capital acquisition of Grand Coulee;
-

- O&M support for Expand capital investment for the Vancouver Control Center beginning in FY29; and
- Support for forecasted resources.

Note: Reductions in expected capital funding will result in delay of the Vancouver Control Center and corresponding Transmission technology investments. Reductions in expected expense funding levels will result in direct reductions in the delivery of planned system replacements for field projects on Criticality 2/3 assets. Additionally, BPA Facilities will assume increased risk premature building system failures from historical underfunding in O&M and lifecycle replacement.

10.4 Implementation Risks

The risks identified in the following table contribute to the inability of the Facilities asset management program to fully reach the optimal level of program execution. These risks can be broadly described as inadequate resources (funding and staffing) and lack of coordination across asset categories. Stagnant expense funding since 2018 that supports the O&M program coupled with the lack of staff to efficiently procure design and construction services has been a contributing factor in accelerating asset degradation.

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 7 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.
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 Criticality 2 assets	Facilities has limited visibility into full asset lifecycle of the second most critical asset criticality level	Work closer with transmission program managers and tie project execution processes together between the groups.
Accurate Staffing Forecasting	Frequent changes to staffing forecasts 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 to 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 FY23.
Changing Environmental Conditions	Changing environmental conditions impacts are adding additional risks to aged facilities	Assess the long term impacts of changing environmental conditions on the highest site reliability areas and develop future strategies to address localized risks.
Missing resources for efficient execution	PgMs currently are COR's for the execution of projects and this distracts for the focus on strategy and program management	Add BFTE PM's that serve as the COR for each regional district to free up the time of the PgM staff to focus on matrix tracking and strategic response/management of the program.

10.5 Asset Conditions 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 decline for the next 5 – 10 years until the completion of the Vancouver Control Center

and Ross Complex lifecycle replacements. This can be attributed to the large amount of capital investment being made to upgrade the Ross Complex while deferring capital investments on other facilities assets in the field. Nominally flat expense funding levels since 2014 have also contributed to accelerated degradation of Facilities assets.

Replacement and renovation of BPA's oldest facilities on the Ross Complex will result in an improvement in the overall portfolio condition. Lessons learned and key achievements at the Ross Complex also establish new project delivery methods, consistent project requirements and quality assurance methods. These improvements will allow for efficient resourcing and consistent estimating towards the end of the strategy window (10 years). The asset registry refresh scheduled to take place in 2023 will provide additional valuable information on asset condition. 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 facility construction
	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

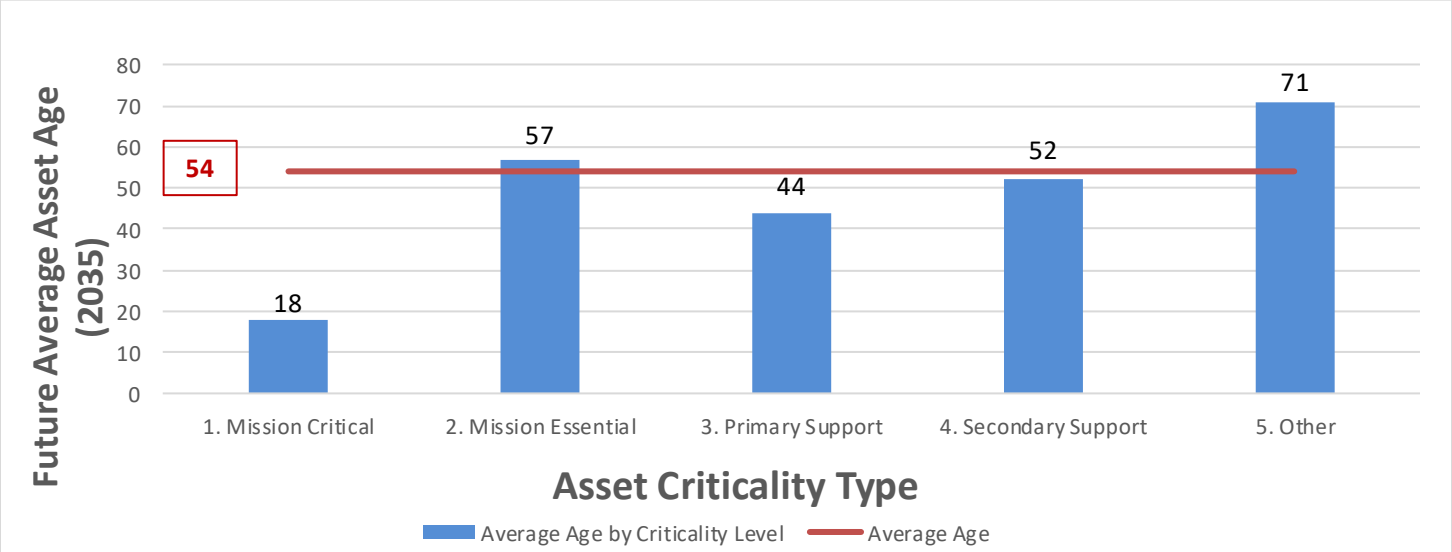


Figure 10.5-1 Future Asset Age by Asset Criticality Level

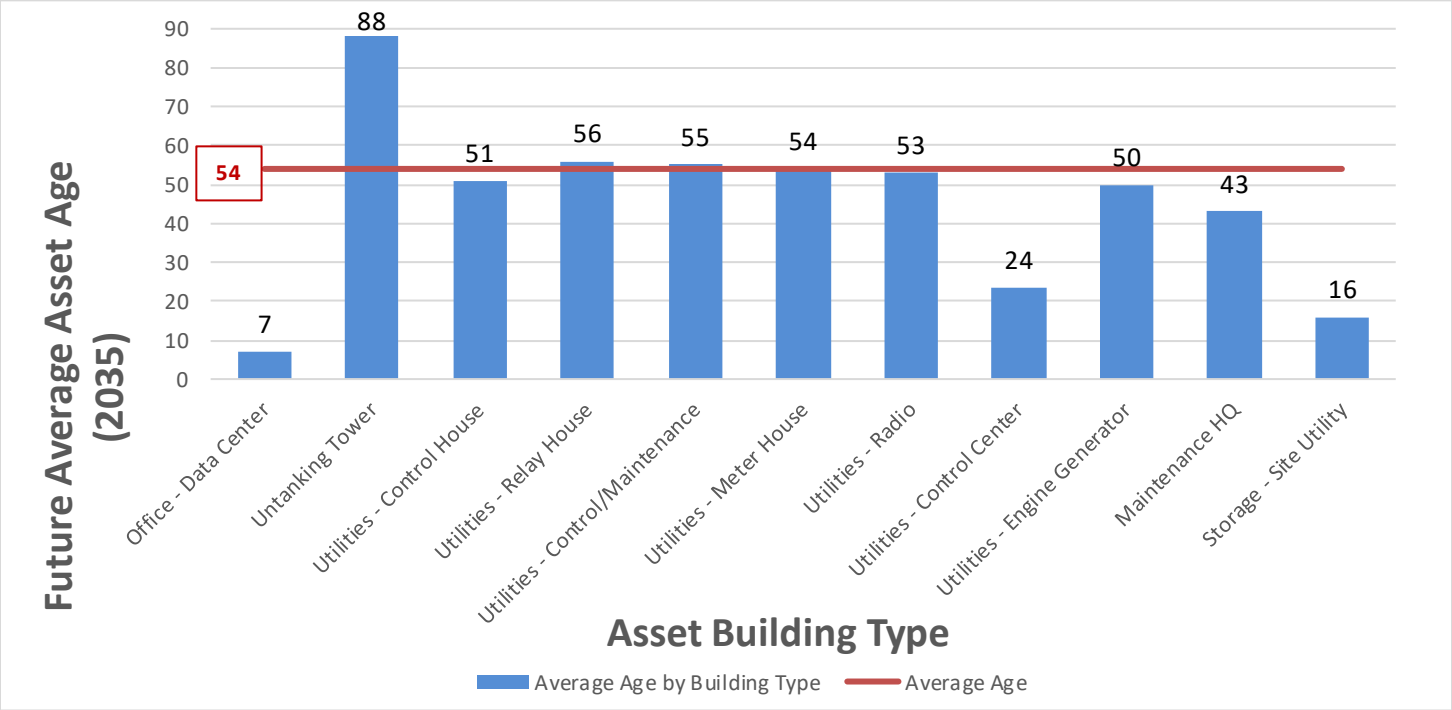


Figure 10.5-2 Future Asset Age by Asset Type

10.6 Performance and Risk Impact

As discussed in Section 7, the approach to risk management will mature as asset information access and tracking improves. Risk assessment, in accordance with the ISO 31000 methodology, forms the basis of the Facilities risk reduction strategy. The intent is to focus reductions primarily on risks to staff, operations and facility assets in all domains of risk compared to the status quo. An intentional risk mitigation strategy in asset Criticality 1, 2 and 3 can minimize negative safety impacts. Additionally, risk assessments provide a framework for risk mitigation prioritization for the proactive management of the Facilities portfolio. BPA Facilities portfolio risks and risk mitigation strategies are as follows:

10.6.1 Safety Risk

The safety and security of our BPA workforce is a core value at the BPA. Given the number of aged assets, the BPA Facilities strategy is to prioritize life-safety upgrades for assets that house the largest number of staff. These assets consist of office facilities and MHQ field sites. These larger sites and complexes are assessed for safety through Strategic Framework Guides (SFG) in order to establish site specific development strategies for capital replacement of aged assets with safety by design principles. Capital replacement 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 reduce the risk profile. Critical building systems in need of replacement are identified with site staff and inform the prioritized investment strategy in the short term. Additionally, the use of the site reliability score will allow resources to be directed to system replacements in the Criticality 1/2 assets.

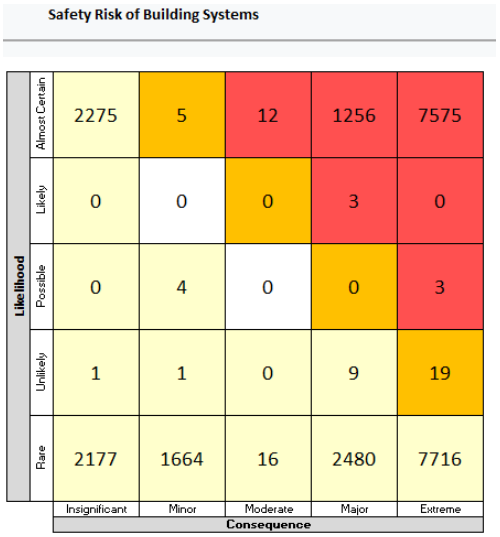
Risk Category	**Safety**	
Asset Risk	Noncompliance with OSHA requirements, life safety codes, and modern seismic design standards are a liability to BPA and present safety risks for staff and resiliency risks for operations and critical assets.	
Owner/Control	NW/TF	
Risk Mitigation	**Strategy:** • Completed – Refresh the asset registry to gain better trending information of system level improvements • 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 • 2-5 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)	

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 2 assets will experience a slow decline in reliability as systems 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 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 2023.

Risk Category	Reliability
Asset Risk	Severe SCI scores Aging portfolio Premature system failures
Owner/Control	NW/NWF/TF
Risk Mitigation	**Strategy:** • Immediate – Coordinate with the transmission group to track the replacement of Critically 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

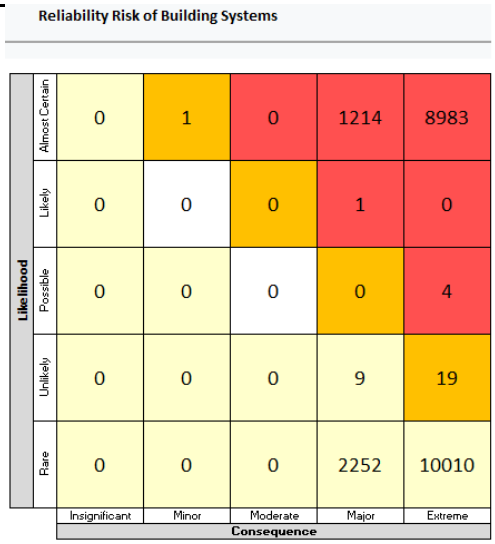


Figure 10.6-2, Strategy, Risk Assessment Reliability

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 and lifecycle refreshes. This would lead to the ability for the simultaneous execution of two major capital projects simultaneously if there is 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.

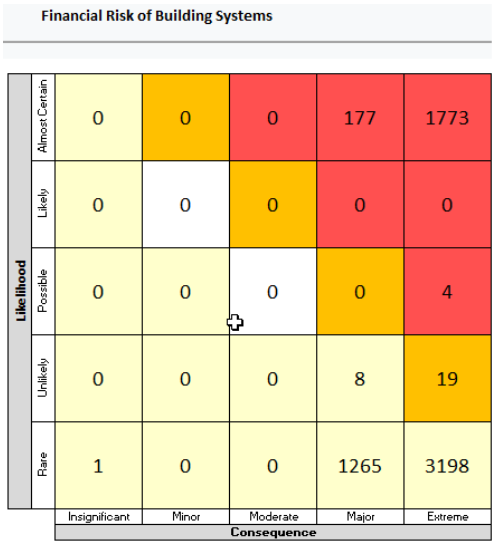
Risk Category	**Financial**	
Asset Risk	Inability to consistently track project expenditures over the project lifespan. Market conditions driving costs higher than planned. Expense funding held flat, not pacing construction inflation.	
Owner/Control	NWM/NWF/TF	
Risk Mitigation	**Strategy:** • Completed – 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.	

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.

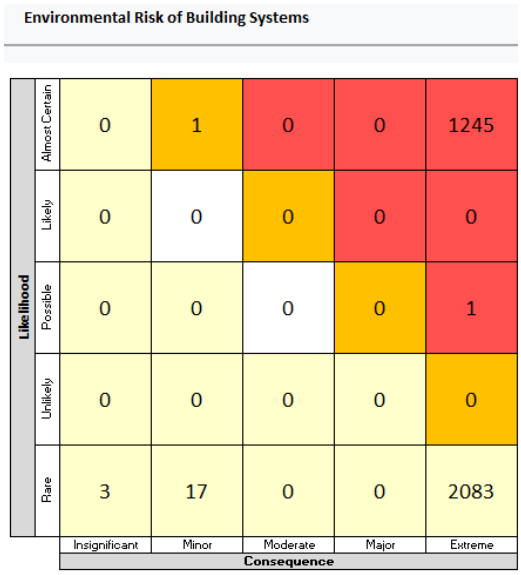
Risk Category	Environmental	
Asset Risk	Inability to meet Agency reduction targets for energy and water consumption. Effects of global warming on assets.	
Owner/Control	NWO	
Risk Mitigation	**Strategy:** • Immediate – Expand Capital acquisition program will create facilities that consume fewer resources, address changing environmental conditions, 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.	

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

10.6.5 Compliance Risk

The primary compliance risk for BPA Facilities relates to physical security, e.g., North American Reliability Corporation Critical Infrastructure Protection (NERC CIP). The risk of not complying with regulations and guidelines is both financial, through possible fines, and also operational, if sites are challenged with timely implementation of security standards. Potential impacts, risk mitigation and specific investments are assessed in conjunction with BPA Physical Security.

A secondary risk exists related to compliance with building and life safety codes. Building and life safety codes are applied at the point of construction and with the code of record at that time. Given the varied portfolio age, it is challenging to provide accurate counts of noncompliance through a modern building and life safety code lens. However, it is clear that many building systems have a potential to impact NERC CIP or code and life safety compliance.

As asset refresh projects are executed, all identified compliance concerns will be addresses as part of those efforts. 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 operational and program goals. Audits of existing sites to gain a better understanding of the current state of compliance and asset registry updates will quantify this risk.

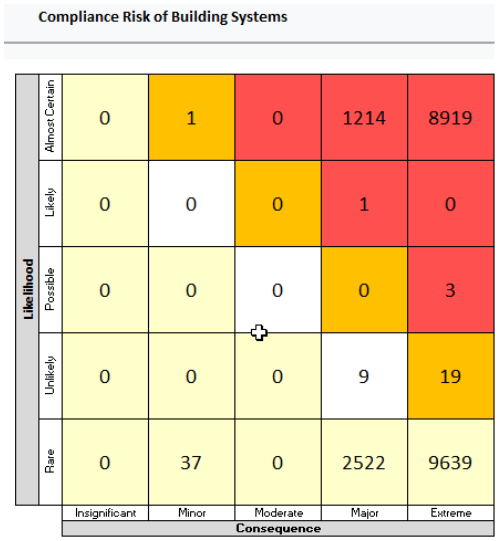
Risk Category	**Compliance**	
Asset Risk	Fines and or undue vulnerabilities due to noncompliance with regulations, guidelines, and standards.	
Owner/Control	NNT, NW	
Risk Mitigation	**Strategy:** • Complete – Apply BPA code compliance policy 440-75 to all future projects. • Complete – Utilize the internal AHJ council to review and approve variances to code compliance as needed to support operations. • Complete – 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.	

Figure 10.6-5, Strategy Risk Assessment Compliance

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	• Implementation of PgMIS V6 • Update Asset Registry	• Correlate investments to changes in asset performance
Shared ownership of Criticality 2 assets	NWM/ TP	• Coordinate with TP on planned investments	• Establish partnership agreement with TP
Staff distribution and forecasting	NWM/NWPS	• Develop a long term telework strategy • Collocate groups with similar functions	• Survey and track utilization rate at field sites • Cancel lease agreements and return staff to Ross Complex
Unified O&M program	NWM/NWF/ TF	• Implement IFM contract • Establish a CMMIS	• Shift all O&M portfolio from NWM to NWF
Limited Expense Funding	NWM/NWF	• Implement alternative project delivery methods • Shift focus to Capital Renewal and Replacement	• Extend IFM contract to field sites
Limited Resources	NW/TENF/ TETC/NSSV	• Leverage vendor services	• Integrate facilities planning, design, and execution into one group
Staff Training	NW/TENF/ TETC/NSSV	• Structure training program around strategic objectives	• 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 additional 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.