FY 2017 – FY 2030 WORKPLACE SERVICES FACILITIES STRATEGY

FACILITIES PLANNING AND PROJECTS (NWM)

*** DRAFT *** 6/1/2016

REVISION HISTORY				
NO.	DATE	SECTION	SUBMITTED	DESCRIPTION OF CHANGES
1.0	2/29/2016	ALL	B. WRIGHT	AMS submitted to Strategic Planning
1.1	05/06/2016	ALL	B. WRIGHT	AMS edits and ExecSUm submitted to Strategic Planning
2.0	6/01/2016	ALL	B. WRIGHT	Final AMS submitted to Finance

Note: *Multiple and significant changes should be characterized as a version change, e.g., 1.0 to 2.0, whereas minor changes should be characterized as a sub-version change, e.g., 1.1 to 1.2.*

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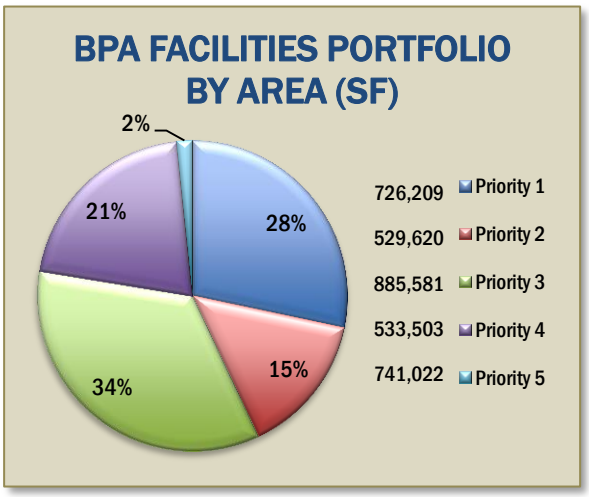
EXECUTIVE SUMMARY

Workplace Services (NW) is responsible for overall agency direction, strategic planning, management and governance of facilities, asset management, and facilities maintenance and operations, space management, printing services, mail services, and office services.

PROFILE OF ASSETS

BPA owns and operates an estimated 2.7 million square feet of building facility assets across Oregon, Washington, Idaho, Montana, and California. This includes over 1,000 buildings and structures at more than 400 sites that include critical infrastructure, such as our control centers, data centers and the Celilo DC Converter Station as well as control houses, maintenance shops, administrative offices and warehouses. These assets play a major role in the operation and maintenance of the Pacific Northwest transmission system.

The majority of the facilities portfolio (60%) is more than 30 years old and in need of elevated levels of repair and maintenance or, in many instances, replacement. The identified backlog of maintenance and repairs (BMAR) has grown to over $240M which represents a very poor Facility Condition Index (FCI) with an average value of .17* and will continue to decline given the current level of funding. The poor facility portfolio FCI represents an increased risk to grid reliability and personnel safety. Furthermore, facility degradation is a risk to the loss of expected operational and economic benefits due to premature failure and increased maintenance expenses.



*this represents the current portfolio average with the current Asset Data Refresh (ADR) only partially completed. When complete, this average will likely shift some.

ASSET CRITICALITY – GROUPED BY ASSET CATEGORY

ASSET CRITICALITY	CATEGORY		ASSET TYPE	
	1	UTILITY 1 *CRITICAL FACILITIES*	Dittmer Control Center Munro Control Center	DC Converter Station HQ & Ross Datacenters
	2	UTILITY 2	Control House Relay House Infrastructure/Utilities	Microwave/Radio Bldg. Engine Generator Bldg. Cable Tunnel
	3	OFFICE, MAINT. & SPECIAL	Office-Mission Essential Maintenance HQ Maintenance Shop	Storage- Special Storage- Vehicle Storage- Material & Equip.
	4	STORAGE	Office-Mission Support Training & Research Meter House	Storage- General Storage- Site Utilities Storage- HazMat
	5	OTHER	Untanking Tower Oil House Other	Lease Abandoned

STRATEGIC OBJECTIVES

NW will continue to bring value to the Agency, by developing and achieving these 3 long term Strategic Objectives that are driven by BPA's Key Strategic Priorities as follows:

	STRATEGIC OBJECTIVES		
	1. Prioritized Asset Optimization	**2. Operational Alignment**	**3. Asset Life Cycle Management**
	Manage facilities assets and prioritize work through disciplined and coordinated processes that optimize mission criticality, risk, resources, return on investment, and sustainability while also maintaining sufficient agility to meet emerging requirements.	Comprehensively integrate Facilities initiatives and projects with other asset categories to the extent practicable.	Manage facilities assets with a life cycle perspective and improve facilities and processes through a continuous Plan–Do–Check–Act cycle.
	Direct Influence	Direct Influence	*Indirect Influence*
	Direct Influence	*Indirect Influence*	Direct Influence
	Direct Influence	*Indirect Influence*	*Indirect Influence*
	Direct Influence	Direct Influence	Direct Influence
	Direct Influence	Direct Influence	*Indirect Influence*

STRATEGIC CHALLENGES

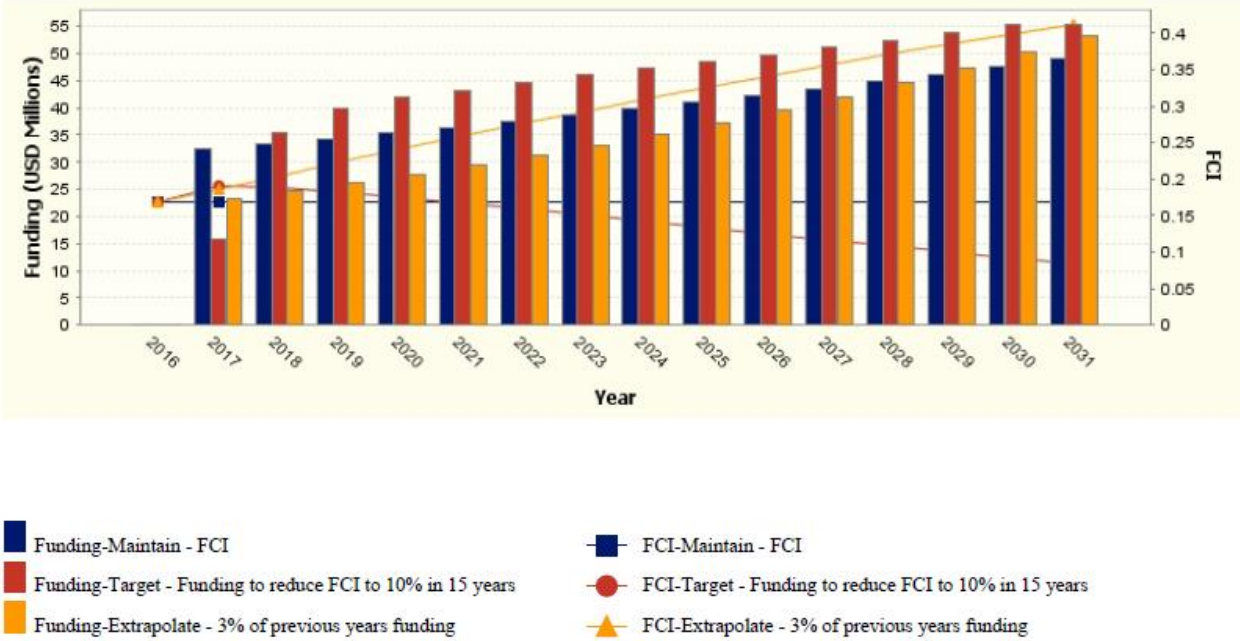
There are several external and internal issues which could/will impact NW's ability to achieve the Objectives lined out in this Facilities Asset Management Strategy. Some issues can be resolved and are subjects of the Strategic Initiatives that follow, while others are best viewed as drivers or constraints and simply must be managed or mitigated.

IMPORTANT: If these risks are not successfully managed, we will fail to achieve our Strategic Objectives and as such, the number life-safety issues will increase, systems will fail, we will not be fully compliant and we will not realize the full return on investments (ROI) assumed when these facilities were constructed, e.g., decreased expected useful life/uptime and increased O&M costs.

- (Internal) Backlogs of facilities maintenance and replacement

- (Internal) Immature facilities planning and maintenance management systems (CMMS)
- (Internal) Inconsistent access to project execution resources (procure, design, construct)
- (Internal) Lack of centralized Facilities O&M program (Corporate and Transmission)
- (External) Evolving regulatory requirements (OSHA, NFPA, building codes, NERC CIP)

FUNDING VS. FCI REPORT



The chart above shows the effects that various funding levels have on the portfolio average FCI. The current FCI of 0.17 is already considered extremely poor and at the current FY16 investment levels of $26.2M and an inflation rate of 3% annually, will fall to 0.40 by FY30 and represent a BMAR of over $434M.

Conversely, to target and achieve a rather low portfolio average FCI of just .10 will take an investment ranging from $35M in FY17 to $55M by FY30.

In lieu increases in capital investments (Major unit replacement), higher level investments in the reconciliation of the backlog of maintenance and repairs (expense budget repairs/replacements) and the creation, resourcing and implementation of an Agency wide O&M program, NW predicts:

- A continuation of more costly break-fix/emergency repairs and system failures that could affect the reliability of the grid or unacceptable life safety issues.
- Loss in anticipated benefit (Lifecycle/ROI) of facilities investments due to shortened lifecycles and premature failures.

STRATEGIC INITIATIVES

In order to achieve the **Strategic Objectives** and to manage the risks presented by the **Strategic Challenges** above, Workplace Services identified the following **Strategic Initiatives:**

1. PRIORITIZED ASSET OPTIMIZATION

1A. Establish Standards
1B. Improve Tracking of Infrastructure Investment
1C. Develop Asset Management Services

2. OPERATIONAL ALIGNMENT

2A. Enable Integrated Infrastructure Decision Making
2B. Establish Partnership Agreements
2C. Establish Asset Management Plans
2D. Zero Based Space Planning

3. ASSET LIFE CYCLE MANAGEMENT

3A. Establish Asset Management Processes
3B. Continually Improve the Asset Management System
3C. Organization Alignment and Furniture Life Cycle Refresh

RESULTS TO BE ACHIEVED

If the Strategic Challenges cited above can be successfully met, BPA and its stakeholders can expect that the longevity, health and reliability of critical and mission essential facilities assets will improve through informed and conscientious facilities asset management best practices in order to ensure:

- Performance and Service standards for all Facility assets are met. *See A-6 SERVICE LEVEL STANDARDS V1 in appendices.*
- Investments are prioritized based on risk and criticality in order, to meet mission requirements and strategic intent. *See A-2 RISK/BENEFIT SCORE METHODOLOGY in Appendices.*
- Facility projects can be delivered within scope, schedule and budget. *Several data points for each of these dimensions have recently been added to our Facilitate project management tool that will serve to inform metrics along these lines.*
- O&M costs are optimized and returns on investments are predictable and fully realized and
- Assets are managed to maintain compliance, reliability and safety. *The ability to achieve these results and to measure their efficacy can only be realized with the implementation of a robust, Agency wide O&M program and the tools (CMMS) to track and manage such a program. An ADF is currently under evaluation aimed at this target.*

This focused strategy will inform us of the state of our assets, as well as their level of performance, both in terms of meeting customers' needs and economic targets while identifying areas of the asset management systems that can be improved.

PROPOSED SPENDING LEVELS

The proposed level of investment represents a comprehensive forecast to maintain reliability and

operation of BPA facilities.

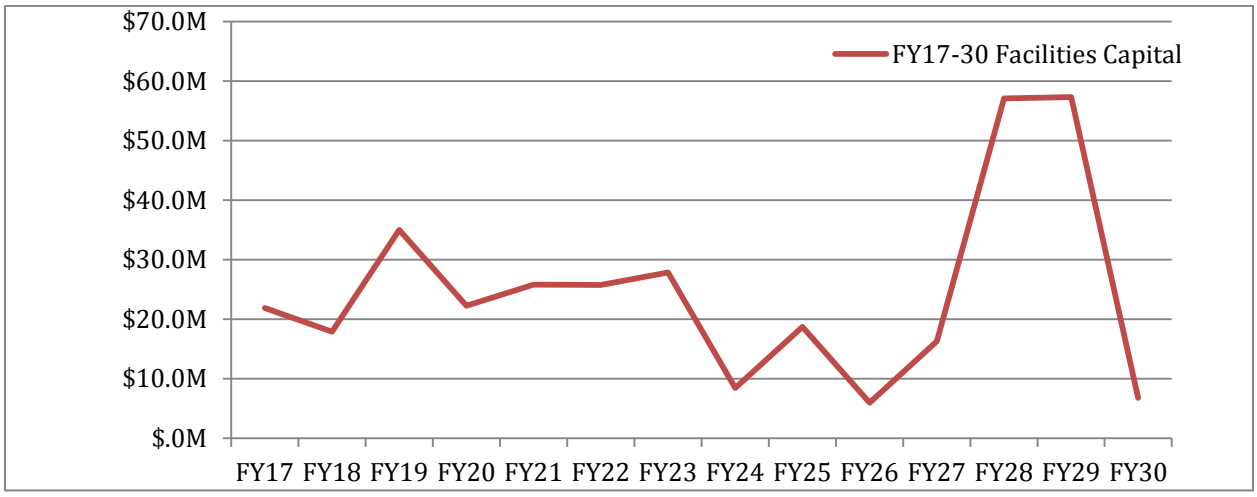
PROPOSED CAPITAL PLAN, FY 2017 – FY 2030

(All figures shown in millions of dollars)

Facilities anticipates capital spending of $74.8 million (FY 2017-19) and $370.3 million (FY 2017-30) for an average of $26.4 million per year. Out year spending levels may be updated based on specific projects that are approved but the CIR funding proposal in total will not change. Corresponding expense funding is anticipated to be an average of $25 million per year, which does not enable addressing the full backlog of deferred maintenance.

Total Capital Spending

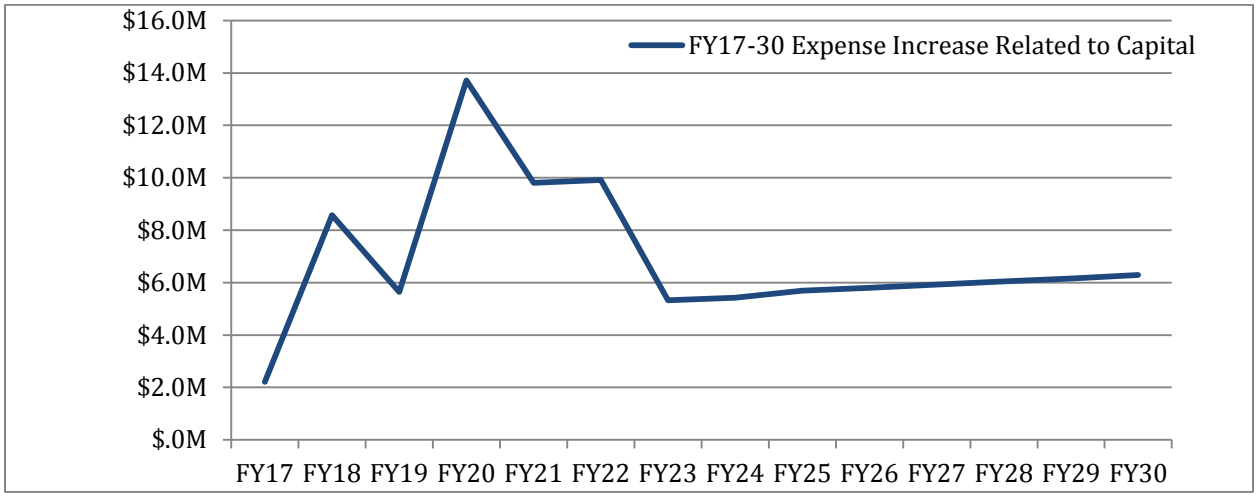
Projects	2016	2017	2018	2019	2020	2021	2022	2023	CIR Total	2024	2025	2026	2027	2028	2029	2030	14 Yr. Total
Trans- Misc. Facilities - Non Electric	5.8	3.6	7.3	11.7	19.9	23.5	19.1	24.0	109.1	8.1	8.2	4.7	4.9	5.0	5.2	5.4	150.5
Corpt- 905 Building	2.5	.0	1.2	1.2	1.2	1.2	1.2	1.2	7.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	16.1
Total- Sustain Investments	**8.3**	**3.6**	**8.5**	**12.9**	**21.1**	**24.7**	**20.3**	**25.2**	**116.3**	**9.3**	**9.4**	**6.0**	**6.2**	**6.3**	**6.5**	**6.7**	**166.6**
Trans- Misc. Facilities- Non Electric	5.6	18.3	9.4	22.1	1.1	1.2	5.5	2.7	60.3	2.8	13.0	9.8	50.7	52.5	7.3	7.3	203.7
Total- Expansion Projects	**5.6**	**18.3**	**9.4**	**22.1**	**1.1**	**1.2**	**5.5**	**2.7**	**60.3**	**2.8**	**13.0**	**9.8**	**50.7**	**52.5**	**7.3**	**7.3**	**203.7**
Total Facilities Investements	**13.91**	**21.89**	**17.90**	**35.01**	**22.25**	**25.91**	**25.76**	**27.88**	**176.6**	**12.0**	**22.3**	**15.8**	**56.9**	**58.9**	**13.8**	**14.0**	**370.3**



PROPOSED EXPENSE PLAN, FY 2017 – FY 2030

(All figures shown in millions of dollars)

Changes to Other Rates Inputs																	
Projects	2016	2017	2018	2019	2020	2021	2022	2023	CIR Total	2024	2025	2026	2027	2028	2029	2030	14 Yr Total
Expense - Transmission Facility O&M	**26.3**	**30.9**	**32.3**	**31.3**	**32.6**	**33.2**	**33.9**	**34.5**	**228.7**	**35.2**	**35.9**	**36.7**	**37.4**	**38.1**	**38.9**	**39.7**	**490.7**
Facility Renewal	.0	2.2	8.6	.0	8.7	4.7	4.7	.0	28.9	.0	.0	.0	.0	.0	.0	.0	28.9
Lease - Office #1 Deferral	.0	.0	.0	5.6	2.0	2.0	2.0	2.1	13.8	2.1	2.2	2.2	2.3	2.3	2.4	2.4	29.6
Lease - Office #2 Deferral	.0	.0	.0	.0	3.0	3.1	3.2	3.2	12.5	5.4	5.7	5.8	5.9	6.0	6.2	6.3	53.8
Expense - Capital Investment Relate	**.0**	**2.2**	**8.6**	**5.6**	**13.7**	**9.8**	**9.9**	**5.3**	**55.2**	**7.6**	**7.9**	**8.0**	**8.2**	**8.3**	**8.5**	**8.7**	**112.4**
Expense - Lease	**21.8**	**22.2**	**22.6**	**22.9**	**23.3**	**23.7**	**24.2**	**24.6**	**163.5**	**25.1**	**25.6**	**26.1**	**26.6**	**27.1**	**27.7**	**28.2**	**349.8**
Total Expense (Excluding Capital Inv	**48.1**	**53.1**	**54.8**	**54.3**	**55.9**	**57.0**	**58.0**	**59.1**	**392.2**	**60.3**	**61.5**	**62.7**	**64.0**	**65.3**	**66.6**	**67.9**	**840.5**



I. ASSET CATEGORY OVERVIEW

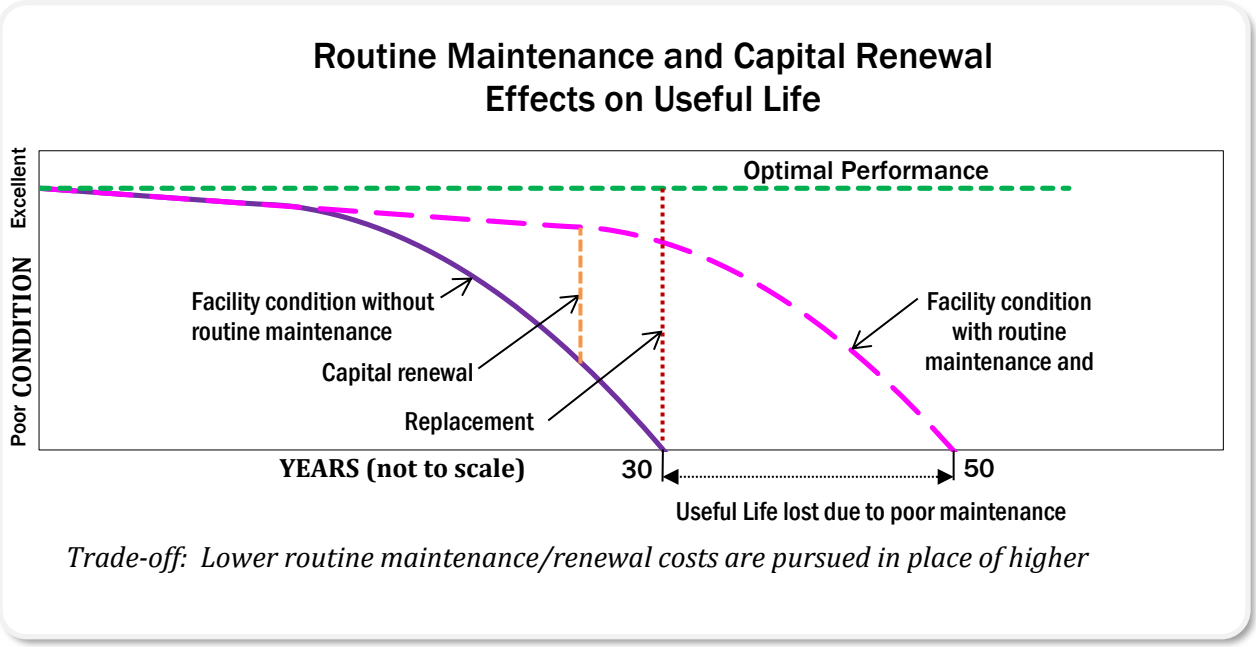
A primary role for facility management in both government and commercial industry is to balance short-term and long-term asset needs. By aligning expenditures with operational requirements an agency seeks to maximize the useful life of assets, assess asset functionality and provide for a planned program of repair, improvement and restoration to meet organizational needs.

Facilities investment activities can be categorized and accounted for in four major ways:

1. O&M (Expense) - Services that help maintain or restore assets or systems to design service levels
2. Renewals* (Capital/expense) - Is the planned replacement of aged or obsolete systems that have reached the end of their useful life. It also includes major renovations of existing facilities to extend their service life
3. Decommissioning (Capital) - Is the action of demolishing or disposing of obsolete or degraded assets
4. New Construction (Capital) - Building or re-building assets via Capital expenditure

*Federal Energy Reliability Corporation (FERC) accounting rules require a mixture of capital and expense funding for renewal activities.

Without recurring reinvestment in facilities and building systems, older facilities will fall into a state of ever-deteriorating condition and functionality which increases the cost of future maintenance and repair.



Trade-off: Lower routine maintenance/renewal costs are pursued in place of higher

KEY ACCOMPLISHMENTS (2014 – 2015)

Since the 2014 Integrated Program Review (IPR) and Capital Investment Review (CIR), NWM invested, through its strategic partners in Transmission Engineering and Transmission Field Services, over $30 million in upgrades, repairs and replacements in the BPA system. Most recently, NWM has:

- Completed the mechanical system upgrade at Dittmer Control Center;
- Completed the 1st, 4th and 6th floor restack at BPA Headquarters which will improve adjacencies and efficiencies;
- Obtained new office space in Vancouver which will reduce the space constraints on the Ross Complex;
- Completed the removal of the lead lined sinks at over 40 control houses across the BPA service area;
- Accomplished Green Globes Certification for four facilities;
- Implemented water efficient landscaping (xeriscaping) at three sites;
- Invested over $1.5 million to address deferred maintenance issues to the stormwater systems at eight sites

In the building replacement/additions area, NWM has invested over $19 million in capital construction projects that include:

- Completed the Tri Cities Regional Maintenance Headquarters and McNary Maintenance Headquarters
- Completed six of the eight remaining communication building replacements
- Completed the Munro Scheduling Center (Alternate Operations Center) to bolster business continuity

In the Program and Planning area, the NWM team is currently planning or has completed projects to input into future work plans:

- Ross Strategic Framework Plan, Life Safety and Capacity Review
- Covington Strategic Framework Guide
- Refresh of the MHQ Strategy by incorporating lessons learned and changing operational requirements
- Phase 1 of the Site Evaluation Reports completed
- North Bend MHQ Cost/Benefit Analysis
- HQ Seismic Feasibility Study
- BPA HQ 7th floor feasibility
- Ross Governance Structure
- A complete refresh of the facility asset data contained in our budget planning tool, VFA.

In addition to direct facilities work, Facilities Planning and Projects has made progress in improving the overall management of the program. NWM has:

- Implemented a robust Program Management function with subject matter experts;
- Adopted the International Code Council's model building codes, and GSA's P100 design standards which will result in a portfolio that is more consistent and more compliant;
- Created a site irrigation and xeriscaping policy to reduce water consumption and promote site maintenance in a consistent, sustainable, economical and efficient manner;

- Completed an in-depth assessment of current operations and maintenance practices;

McNary Maintenance Headquarters (Photo: BPA)

Lines Creek Radio Station (Photo: BPA)

FACILITIES ASSETS AND SERVICES PORTFOLIO

PROFILE OF FACILITY SERVICES

Workplace Services (NW) provides a comprehensive program of facilities and critical asset management and associated other facility services as follows:

FACILITIES OPERATIONS AND MAINTENANCE (NWF)

- NWF HQ is responsible for planning, operations and maintenance of the GSA delegated headquarters office facility in Portland, and all commercially leased office space throughout the BPA region and Washington DC to ensure a safe, reliable, and productive environment.
- NWFC responsibilities include the operations and maintenance of the critical facilities and critical systems at agency control centers and data centers that support the agency's mission and business critical assets.
- NWFR is responsible for the operations and maintenance of the ~240 acre Ross Complex, which accounts for ~30% of the total BPA owned facilities portfolio.
- NWFR-MEAD provides the day-to-day operations and maintenance for the Munro Scheduling Center.

The NWF/NWFC/NWFR/NWFR-MEAD organizations review and evaluate facilities within their area of responsibility and develop and implement options that meet strategic agency requirements including the federal initiatives and mandates for sustainability.

FACILITIES PLANNING AND PROJECTS (NWM) is responsible for the overall strategic planning, governance, and oversight of agency facilities in accordance with BPA asset management policy 240-1 This includes program planning, oversight, development of policy and guidance, establishment of condition assessment criteria, project prioritization, financial management, technical oversight and support, facility standard development and implementation, and performance analysis and reporting. The organization is comprised of engineers, architects, interior designers, technical specialists, technicians, contractors and facilities asset management and program

FACILITIES ASSETS
All site buildings associated mechanical, electrical, structural, and utility systems, surrounding grounds and other fixed improvements upon the land within the sites controlled by the agency.

BUILDINGS
Any permanent structure with a roof, walls and floor which shelters people or property from the elements. This includes control houses, relay houses, maintenance headquarters, shops, and vehicle storage. Control and Meter houses on remote sites also fall into this category.

NON-BUILDINGS
Any permanent infrastructure, such as fixed cranes, fences, pavements, water distribution, storm and sanitary sewer systems, and other site improvements and appurtenances fall into this category.

PERSONAL PROPERTY
Any modular, portable or otherwise movable "building" (with or without Z numbers) such as metal cabinets/ enclosures, Conex or similar storage boxes/shipping containers, sheds, and latrines are considered personal property for which, NW is not responsible.

management experts. NWM also develops BPA interior space standards, space allocation, furniture standards and related policies.

BUSINESS SERVICES (NWP) includes the transportation program and subsidies, parking, conference room scheduling, the office supply program, non-IT office equipment program, delivery and receiving, motor pool and valet parking.

SPACE MANAGEMENT SERVICES (NWPS) is supports office/employee moves, workstation adjustments, furniture repairs, management of furniture inventory, and furniture installers.

BUSINESS SERVICES (NWPP) includes printing, reproduction, and graphic production and mail services.

BUSINESS OPERATIONS (NWO) NWO functions as governance/oversight role for NW management: Provides financial review and report of NW; Ensure financial trends are regularly provided; Report building information to DOE and update maintenance program; Manage NW SharePoint; Manage NW policies and guidance; Provide recommendations and studies on financial and regulatory standards; Provide recommendation on Utility management and controls; Be the SME for financial and regulatory standards; Manage information for DOE FIMS.

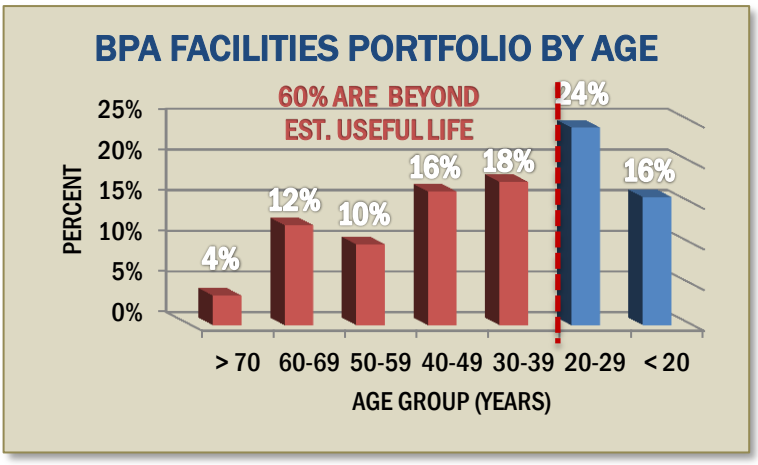
PROFILE OF FACILITY ASSETS

BUILDING ASSETS

NWM facility assets support the transmission system and consist of 1000+ facility assets such as: control centers, control houses, relay houses, microwave radio buildings, maintenance buildings, offices, meter houses, storage buildings and oil houses. Assets are prioritized by operational criticality, type and system.

To improve facilities coordination across programs all facilities work, supporting building systems and fixed infrastructure, e.g., network cable plant, etc., is included for prioritized execution in this AMS.

The majority of the portfolio (60%) is older than 30 years old and in need of elevated levels of repair and maintenance, or in many instances replacement. Backlog of maintenance and repair (BMAR) grew to over $140M over the years due to competing priorities/lack of resources and difficulties prioritizing and executing facilities work. The volume of BMAR drives facility reliability to unhealthy levels.



NWM is challenged to address a large number of premature assets/systems failures long before the expected useful life (EUL), which is compounded by a lack of renewal. Renewals or replacements are cost-effective solutions for degrading facilities conditions.

NON-BUILDING ASSETS

NWM began an inventory of non-building assets in 2013 and roughly 60% of site infrastructure, utilities, fencing, paving, landscape elements and site appurtenances are identified, with the balance scheduled to be inventoried in FY16.

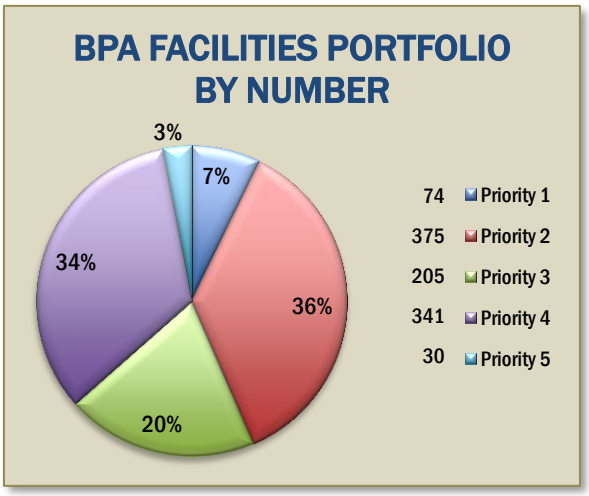
To improve oversight for facilities in accordance with the agency Graded Security Plan, physical security related projects are being integrated into the facilities portfolio. FY 14 Critical Asset Security Plan (CASP) projects and FY 15 NERC-CIP Compliance Enhancement projects and budgets are currently being managed by NWM.

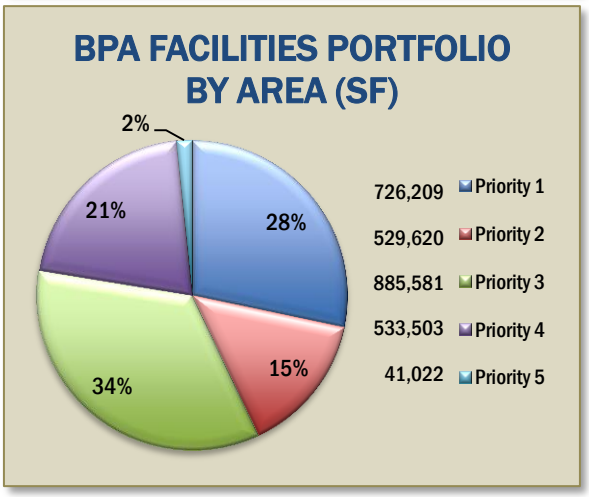
PERSONAL PROPERTY

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

LAND

While BPA undeveloped land assets are specifically excluded in this strategy, as they are within the purview of the Transmission Real Property Services (TER) organization. NWM actively collaborates with Transmission to inform facilities decisions and facilities asset registry information for the over 400 sites in the BPA service area.





ASSET CRITICALITY AND PRIORITIZATION

CONTINUITY OF OPERATIONS

In accordance with the *BPA Manual, Chapter 133: Continuity of Operations*, Facilities Planning and Projects supports and enables BPA Continuity of Operations by appropriately identifying and categorizing facilities and associated functions. In doing so NWM appropriately identifies critical assets and provides specialized project support to ensure their operability. Dedicated O&M support for agency business continuity and critical assets is provided by the NWFC Critical Facilities Team which provides 24-hour support and response. Furthermore, the focused efforts of the Critical Facilities Team bridge the continuity gap between immediate tenant needs and life cycle management through the creation of Asset Management Plans to support Primary Mission Essential Functions (PMEF).

In general, critical assets and systems are those whose failure will directly affect the reliability of grid operations or business critical applications. The critical systems are prioritized by the impact they have on safety, reliability, and performance.

ASSET GROUPING

Facilities are grouped according to mission criticality as follows: Primary Mission Essential Functions or Category 1 assets, Mission Essential Functions (MEF) or Category 2 and 3 assets, and Essential Support Activities (ESA) or Category 4 and 5 assets.

ASSET CRITICALITY – GROUPED BY ASSET CATEGORY

ASSET CRITICALITY	CATEGORY		ASSET TYPE	
	1	UTILITY 1 *CRITICAL FACILITIES*	Dittmer Control Center Munro Control Center	DC Converter Station HQ & Ross Datacenters
	2	UTILITY 2	Control House Relay House Infrastructure/Utilities	Microwave/Radio Bldg. Engine Generator Bldg. Cable Tunnel
	3	OFFICE, MAINT. & SPECIAL	Office- Mission Essential Maintenance HQ Maintenance Shop	Storage- Special Storage- Vehicle Storage- Material & Equip.
	4	STORAGE	Office- Mission Support Training & Research Meter House	Storage- General Storage- Site Utilities Storage- HazMat
	5	OTHER	Untanking Tower Oil House Other	Lease Abandoned

A site may have numerous assets in multiple asset categories. For example, a substation may have a control house, a maintenance shop, a warehouse, and a small storage shed, each with its own potential impact to BPA's operations. NWM has defined asset criticality by facility asset types rather than for individual sites. This provides prioritized and focused attention to assets with limited resources. Failure of these facilities could have immediate and serious impacts to the operation of the power system, in addition to impacts on employee productivity and safety.

SYSTEM GROUPING

Just as each Asset Grouping has varying levels of prioritization, each system within an asset poses a different level of importance as relates to the operation of the building. The criticality of building systems reflects the role that a system plays in keeping an asset functioning safely, efficiently, and reliably.

		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	

The American Society for Testing and Materials (ASTM) E1557 Uniformat II standard establishes a classification of building systems and related site work. Systems are major components common to most buildings and usually perform a given function, regardless of the design specification, construction method or materials used. Using this standard NWM has categorized systems into five categories based again on the impacts a system has on the operation of the transmission and power system and in supporting critical business functions. The figure below shows a summary of the five category levels and representative examples of the types of systems associated with each.

ROLES AND RESPONSIBILITIES

Facility Planning and Projects (NWM) is responsible for the overall facilities asset management program. This includes agency program planning and oversight, development of policy and guidance, establishment of condition assessment criteria, project prioritization, financial management, technical oversight and support, development and implementation of facility standards, performance analysis and reporting. In addition, NWM performs the following:

PROGRAM PLANNING

- Maximizes the long-term operational and economic value of the Facilities assets
- Prepares and maintains Facilities Asset Plans outlining requirements for specific program areas and assets
- Prepares and maintains a comprehensive inventory of Facilities Assets
- Establishes policies for Facilities assets
- Maximizes the long-term operational and economic value of the Space assets
- Prepares and maintains Facilities Asset Plans outlining requirements for specific program areas and assets
- Prepares and maintains a comprehensive inventory of space assets
- Establishes policies for space assets
- Facilitates initiatives to look at how buildings are being used, to study space requirements & business requirements, Facilities issues, general issues, and opportunities to improve buildings and overall space
- Studies the use of existing buildings to maximize office space use where appropriate
- Provides short and long term solutions to house people in office spaces
- Provides specifications for furniture and interior standards and processes

- Manages and administers all interior office space allocation, space design standards and furniture standards

WORK PLAN – DEVELOPMENT, COORDINATION, AND APPROVALS

- Projects the need for replacement, new or expanded facilities assets in coordination with stakeholders and strategic partners
- Identifies and ranks mandatory, essential, desirable and deferrable repair, replacement, and expansions of Facilities Assets based on need, risk, and ROI
- Develops rolling work plans including projects prioritized based on need, risk, execution capabilities, funding availability, end-user priorities and ROI
- Project Management interior space upgrade related projects
- Project Management for interior office space projects
- Coordinate schedule and installs with IT and other service providers

BPA FACILITIES ROLES AND RESPONSIBILITIES

			ROLES & RESPONSIBILITIES (FACILITIES)				
			Activity	Standards	Budget	Planning	Execution
ASSETS & SYSTEM TYPES	Facilities & Non-Bldg Assets	*Architectural* *Mechanical* *Electrical* *Civil* *Other*	New Facilities	NW/T	NW/T	NW/T	NW/T
			Upgrades & Replacements	NW/T	NW/T	NW/T	NW/T
			Maintenance	NW/T	NW/T	NW/T	NW/T
			Metrics & Targets	NW	NW	NW	NW

NW – WORKPLACE SERVICES *T – TRANSMISSION SERVICES*

FACILITIES PROGRAMS / ASSET MANAGEMENT PLANS

In keeping with *BPA Policy 240-1: Asset Management* and leading asset management practices, NWM is actively developing Asset Management Plans (AMP) for a number of asset types which would benefit from focused and life cycle planning. Asset Management Plans are to be developed, reviewed and renewed on a biannual basis in accordance with the agency IPR and CIR cycle for Asset Categories. The following program areas are identified for further or future AMP development:

FACILITIES MANAGEMENT PLAN

In the past, NWM's work plan had been prioritized by individual work requirements associated with specific building systems which were ranked and competed for funding. The resulting work plan was a mix of small projects spread across BPA's service territory. These smaller projects addressed multiple issues at different times at the same site. This resulted in a lack of communication and coordination, duplication of work efforts and frustration among field personnel. Also, due to the competition for resources in contracting, design, as well as in construction, many projects were left incomplete at the end of each fiscal year with significant funds remaining unused.

Recent success in executing facilities work is a direct result of creating larger projects at select sites by

coordinating work from multi-disciplinary teams from multiple programs, e.g., Transmission expansion, seismic upgrades, security enhancements, etc. To build upon that success the NWM Program Management team developed a program in which Architects and Engineers (A/E) evaluated prioritized sites and work packages that were delivered to the Transmission Engineering Projects (TEP) organization for execution. They will be implemented in a coordinated fashion with other projects across the agency for optimization of resources and scheduling efficiencies.

SUSTAINABILITY ACTION PLAN

NWM developed the Sustainability Action Plan (SAP) as a way to document BPA coordinated efforts and approach towards meeting the agency's Sustainability Cross Agency Targets (XAT) and to identify partnership and coordination opportunities within other BPA asset categories, functional programs and organizations. The SAP outlines a biannual plan in specific actions to address energy, water, materials and operational efficiencies. Each year the NWM SAP will be updated based on the program and Federal requirements.

MAINTENANCE HEADQUARTERS ASSET PLAN

Transmission field maintenance is central to ensuring reliability and continuity of BPA grid operations. Field maintenance is conducted out of regional and district headquarters facilities across BPA territories. Facility capabilities and support, however, vary from location to location and average facility condition is poor. To address this ongoing and increasing need to cost-effectively implement consolidated facilities requirements, NWM established a master strategy for maintenance headquarters (MHQ) facilities in 2011.

The master strategy is guided by the 10-Year Strategic Plan which establishes a road map to plan new facilities and major upgrades at MHQ installations. Projects have recently been completed at McNary, Tri-Cities and are currently underway at Ross, COVI and Celilo (Dalles/Big Eddy). This roadmap has identified a prioritized list of facilities in highest need of capital renewal or replacement and delineates a set of strategic objectives that standardize the minimum facility requirements necessary for supporting operational excellence within Transmission Field Services (TF).

Program Value:

1. Lower lifecycle maintenance: Replaces facilities with high O&M costs
2. Improved Transmission reliability by enabling shorter response times of BPA field crews
3. Improved continuity (e.g. code-compliant, seismically braced facilities)
4. Higher productivity: Co-locates staff, right-sized facilities and enhanced work conditions

Deferment Risks:

Program facility replacement (4 sites) construction completion extended from FY22 to FY26

1. Higher ongoing facility costs: Expensive break/fix O&M
2. Lower reliability: Slower crew coordination and response times
3. Continuity: Reduced seismic preparedness

ROSS STRATEGIC FRAMEWORK PLAN

NWM established a 20-year asset management strategy for BPA's Ross Complex in 2014. The Ross Complex is the largest BPA owned property with over 70 buildings and 30% of BPA portfolio area (GSF). Many of BPA's critical functions are located at Ross including the Dittmer Control Center (dispatch), Ross Warehouse operations (logistics), data center, test labs, fabrication shops, loan pool and garage. It is also the largest staffing center at BPA with over 900 employees.

The Ross Strategic Framework Plan (RSFP) seeks to move away from past organic growth and better align future development with Agency strategy, prioritize investment needs and coordinate high priority investments, many of which compete for the same land resources.

Program Value:

1. Workflow optimizations through improved facility solutions for BPA work groups.
2. Lower lifecycle cost through end-of-life facilities and infrastructure replacement
3. Improves site efficiency and land utilization
4. Enhanced safety (e.g. use-based districting of functions and circulation schemes)
5. Improved continuity and Reliability: Ensures critical functions are housed in appropriate facilities with supporting services in the event of an emergency or disaster (e.g. seismic event)

Deferment Risks:

Lifecycle replacement office building is removed and pursuing commercial lease as a long-term staffing strategy.

1. Higher cost of operations (e.g. productivity, higher reliance on vendor support)
2. Lower transmission reliability (e.g. seismic preparedness)
3. Increased lease burden due to EUL office facilities
4. Higher O&M costs (expensive break/fix O&M)
5. Ongoing safety risks (e.g. poor work adjacencies and circulation layouts)

STRATEGIC FRAMEWORK GUIDES

Building upon the success of the Ross Complex Strategic Framework Plan (SFP), NWM has implemented a program to develop similar framework guides at critical sites that are intended to guide facilities and space management projects in support of the BPA mission. Strategic Framework Guides will provide a mission driven facilities planning strategy with phased solutions over the next 20 years. The guide will create long term vision and guiding principles for entire complexes, define operational and other patterns, functional uses and create a phased implementation plan with actionable items and complete predesign activities consistent with planned new MHQ projects.

Program Value:

1. Workflow optimizations through improved facility solutions for BPA work groups.
2. Lower lifecycle cost through end-of-life facilities and infrastructure replacement
3. Improves site efficiency and land utilization
4. Enhanced safety (e.g. use-based districting of functions and circulation schemes)
5. Improved continuity and Reliability: Ensures critical functions are housed in appropriate facilities with supporting services in the event of an emergency or disaster (e.g. seismic event)

Deferment Risks:

1. Higher cost of operations (e.g. productivity, higher reliance on vendor support)
2. Lower transmission reliability (e.g. seismic preparedness)
3. Higher O&M costs (expensive break/fix O&M)
4. Ongoing safety risks (e.g. poor work adjacencies and circulation layouts)

SMALL CAPITAL RENEWAL PROJECTS AND SYSTEM REPLACEMENTS

Small Capital Projects program provides funding for smaller facility renewal projects and system replacements that are outside the scope of larger asset management plans. Lifecycle replacement of

small facility assets and system replacement of major facility assets are ongoing needs which can emerge without prior planning, requiring near term action.

The largest planned components include communications building replacements in partnership with Transmission Planning and station service upgrades in partnership with Substation Engineering. Operationally, BPA communications buildings collectively serve several purposes, most notably: (1) The continual monitoring and traffic control of the grid; (2) Protection from rolling outages due to line faults; and (3) BPA Security purview of the NERC-CIP network. Because of the importance of each one of these functions, the microwave buildings are classified as Tier 1 structures and cannot be allowed to fail.

Station Service upgrades replace aging infrastructure to provide greater reliability for BPA facilities at lower lifecycle cost, enhanced standardization of parts and equipment and reduced reliance on specialized labor, improved risk management from time based maintenance (system failure) procedures to reliability-centered maintenance (RCM) to strategically manage failure risk, and improve safety by way of older station equipment replacement to increase operator safety through mitigation of arc flash risk.

Other project types which are typical to small capital project investments include whole system replacements at facilities with EUL mechanical, electrical and plumbing systems.

Program Value:

1. Improves reliability, resiliency and life-safety through lifecycle replacement of infrastructure (e.g. Transmission communication buildings, station service distribution)
2. Improved life-safety conditions through safer working environments (e.g. road repairs and seismic readiness)

Deferment Risks:

Small facility replacements removed from FY17 and held at reduced levels in FY18-30

1. Increased reliability risk due to unforeseen failures, inability to adapt facilities for system modernization (e.g. egress, roofs, HVAC)
2. Unresolved life-safety hazards

PORTLAND-VANCOUVER OFFICE SPACE STRATEGY

NWM Strategic Space Planning is planning to develop solutions for workplace upgrades and space accommodations of BPA facilities and leased properties. To this end NWM is pursuing a long-term strategy for the staffing at Ross-Van Mall per recommendations from the NWM initiated Ross Complex Strategic Framework Plan. The goal of the Portland-Vancouver Office Space Strategy (PVOSS) is to identify cost effective optimization of staffing allocation which addresses immediate BPA space needs while providing flexibility for future fluctuations in staffing. Recent trends show an average 4.25% growth in staffing over the last five years reflecting BPA's system expansion. Current forecasts by NWS predict this growth rate to continue for the next 5-10 years which will exceed current office capacity in the Portland-Vancouver area. It is anticipated that cost effective staffing solutions will result in an optimized combination of leased space and BPA owned facilities, determined in large part by first cost, expected long term benefits and retained space flexibility capable of accommodating evolving economic climates.

Program Value:

1. Optimizes facilities asset ownership value
2. Improves flexibility to support operations

Deferment Risks:

1. Higher cost lease alternatives
2. Inability for work groups to effectively co-locate

DEMOLITION/DECOMMISSION ASSET PLAN

The Demolition/Decommission Asset Plan is a key component of "cradle to grave" asset optimization. The BPA facilities portfolio is heavily weighted towards facilities 30 years and older with a significant number exceeding 50 years of operation. Many of these facilities are approaching functional obsolescence, end-of-life (EUL) status due to seismic or internal safety concerns or EUL due to deferred maintenance exceeding replacement costs. Under the Demolition/Decommission Asset Plan poorly maintained, non-functional or permanently vacant structures that have been identified by NWM as having negative benefits to BPA are slated for demolition or decommissioned. This may occur when the Current Replacement Value (CRV) exceeds the cost of deferred maintenance or cost of required upgrades. Demolition or decommissioning is a cross-agency coordination effort typically performed in conjunction with building site occupants.

Value Proposition:

1. Proactive management of safe work environments (abatement) in accordance with life-safety/occupational standards and national historic preservation requirements

Deferment Risks:
Demolition projects removed from FY17 and held flat in FY18-30:

1. Increased risk of occupational health or environmental incidents which would result in unplanned mitigation or disruption of BPA operations

HAZARDOUS MATERIAL ABATEMENT PLAN

Due to the age of BPA's facility portfolio a number of structures contain hazardous building materials including lead, asbestos, polychlorinated biphenyls (PCB's), and mercury. The uncertainties of where these materials are located, their risk to exposure, and the lack of consistent guidance and training to safely work around these materials presents an unacceptable risk to the Agency and personnel in the absence of an abatement plan.

This is an ongoing initiative which establishes internal safety and abatement parameters by which NWM funds, coordinates and disposes of hazardous building materials. Removal and disposition of HAZMAT materials is conducted by contracted field experts which mitigates the risk of non-compliance with OSHA and EPA regulations. A recent example of this was the successful removal, abatement and restoration of all lead lined sinks within the Agency.

Value Proposition:

1. Proactive management of safe work environments (abatement) in accordance with life-safety/occupational standards and national historic preservation requirements

Deferment Risks:

Abatement removed from FY17 and held flat in FY18-30

1. Increased risk of occupational health or environmental incidents which would result in unplanned mitigation or disruption of BPA operations

BPA HEADQUARTERS CAPITAL PROJECTS PLAN

The BPA Headquarters is a leased facility with capital appropriations which needs between $2.2-2.5 million per year. These expenditures support BPA workplace standards, facility-based business needs for NWM partners and ongoing improvement of Agency energy efficiency goals. Recent investments in support of the above include mechanical system upgrades, more efficient office space standards via the "Work Solutions Program" under Space Management Services, and workplace support functions including kitchen and restroom right sizing and efficiency upgrades. As a leased facility, the primary driver for capital allocation at this facility is asset optimization.

PRIORITIZATION

NWM strives to optimize asset management efforts by addressing the right project at the right time and to appropriately assess risks in accordance with the BPA Risk Management protocols. In order to ensure that the facilities requirements are addressed in the proper order NWM uses a Risk/Benefit Score Methodology during project intake and approval to assist with the appropriate project prioritization. This tool cross-references the asset and system criticalities with the facilities overall condition to generate a risk score to assist in ranking and identifying potential risks to the transmission system and employee safety of issues arising at BPA sites and facilities.

II. ASSET MANAGEMENT OBJECTIVES

The overall long-term objective of the Facilities program is to optimize or fully leverage the asset portfolio to provide reliable, sustainable assets that fully meet current and known future agency business needs, as well as results oriented performance objectives, that comply with all applicable regulations while minimizing the life cycle costs.

As such, the overarching Workplace Services organization has created three (3) long-term Strategic Objectives and Sixteen (16) Initiatives and is currently initiating a benchmarking effort by establishing key metrics to better enable the agency to track the performance of facilities assets and services over time.

STRATEGIC OBJECTIVES

1. PRIORITIZED ASSET OPTIMIZATION

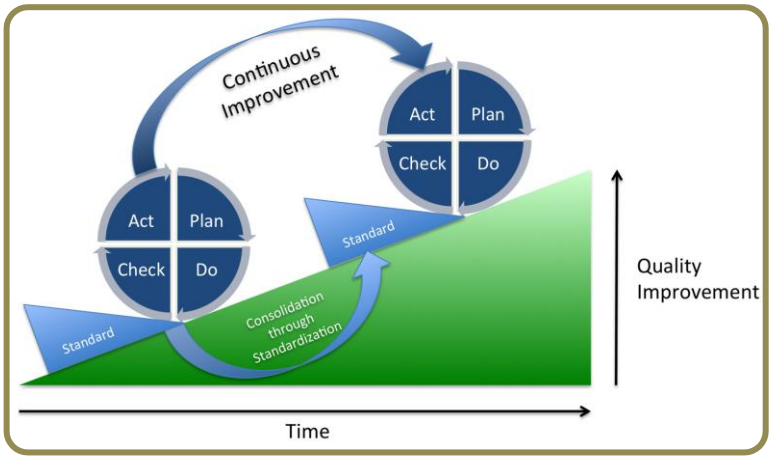
Manage facilities assets and prioritize work through disciplined and coordinated processes that optimize mission criticality, risk, resources, return on investment and sustainability while also maintaining sufficient agility to meet emerging requirements.

2. OPERATIONAL ALIGNMENT

Comprehensively integrate Facilities initiatives and projects with other asset categories to the maximum extent practicable.

3. ASSET LIFE CYCLE MANAGEMENT

Manage facilities assets with a life cycle perspective and improve facilities and processes through a continuous Plan–Do–Check–Act cycle.



STRATEGIC ALIGNMENT

The chart below shows the relationships between the various NW Strategic Objectives and Agency KSI's

	STRATEGIC OBJECTIVES		
	1. Prioritized Asset Optimization	2. Operational Alignment	3. Asset Life Cycle Management
OUR PEOPLE	Direct Influence	Direct Influence	Indirect Influence
SUSTAINABLE FINANCES & RATES	Direct Influence	Indirect Influence	Direct Influence
THE NATURAL ENVIRONMENT	Direct Influence	Indirect Influence	Indirect Influence
PHYSICAL ASSETS	Direct Influence	Direct Influence	Direct Influence
RELIABLE, EFFICIENT & FLEXIBLE OPERATIONS	Direct Influence	Direct Influence	Indirect Influence

STRATEGIC INITIATIVES AND EXECUTION RISKS

The Strategic Initiatives described in detail below were developed to assist in bridging the gaps between the targeted asset performance objectives and the current situational status. The successful implementation of the following also identifies pertinent execution risks for each.

1. PRIORITIZED ASSET OPTIMIZATION

1A. ESTABLISH STANDARDS

Building, operating and maintaining the "right things right" is critical. Standardizing the various elements in an asset's life cycle is a key towards enabling consistent and cost-effective analysis. This results in a more uniform portfolio where efficiencies of design, construction and O&M activities/costs are realized that facilitates the utilization of "apples to apples" lagging indicator data that will drive improvements to standards; i.e., constant process improvement.

SERVICE LEVEL STANDARDS

In 2013, a working group consisting of key business partners was consulted and core lines of facilities services were assessed in the development of V1 Service Standards (see Addendum A-6) with an initial deployment made within the CFT portfolio at BPA's Dittmer Control Center and Munro Control Center and within NWF.

Critical Facilities Team (CFT):
Consistent with the Service Level targets developed earlier, CFT has successfully established and documented an Emergency Notification system for all Critical Systems/Alarms in order to ensure an appropriate response to minimize unplanned outages or interruptions to service. This document resides with the AMS personnel and is maintained by CFT staff members. CFT has completed several O&M requirements documents, has implemented an interim CMMS and developed several PMPs in support of critical equipment systems for HQ, Dittmer, Munro and Z992. Monthly tests are being done and documented, PMP's have been developed for several pieces of critical equipment or systems and unplanned outages have all but been eliminated.

O&M:
The O&M Service Standards targets (Good-Fair) for HQ, Ross, Portland Hangar and Munro sites are being met or exceeded for several of the key measurements. (Emergency Response, Building Systems in "good to fair" range, 6 Strategic Facilities Objectives, etc.). Ross Facilities has developed and implemented 208 Maintenance Standards to provide for PM for numerous equipment systems or processes throughout the complex. All of the O&M personnel (Ross, HQ and Munro) successfully address all Emergency Calls well within the 24 hour expectation, communicate with building occupants and maintain buildings in the "good – fair" range of the Service Level Standards.

DESIGN STANDARDS

It has been noted in various professional literature that 80% of one's ability to positively affect O&M (costs, operability, maintainability, reliability, etc.) are determined by the decisions made during the design and construction of facility assets. The more standardized the portfolio is the more economies of scale can be leveraged in areas such as 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 standards that drive the design/construction phase. As such, Facilities has adopted the current International Code Council building codes (ICC) and GSA's P 100 Design Standards and intends to adapt them to the Agency's unique requirements as needed.

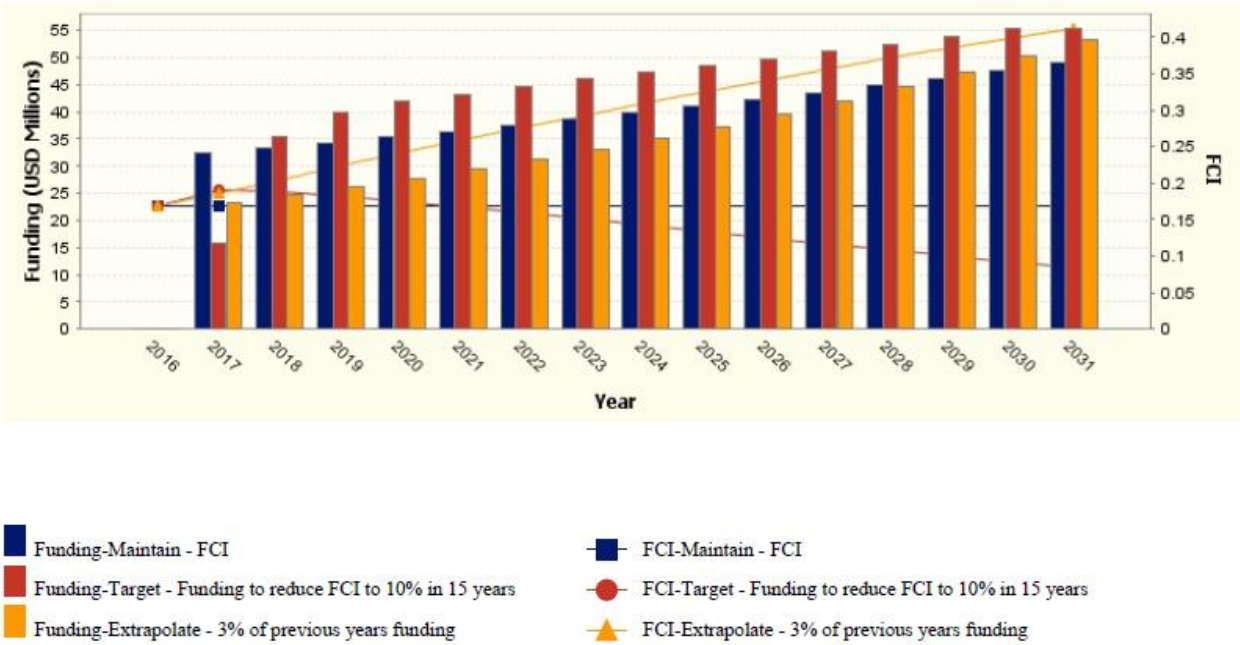
MAINTENANCE AND MAINTENANCE STANDARDS

In addition to design and construction standards, the Service Level Standards that were established were intended to drive the selection and implementation of industry best maintenance practices for the various assets/systems/components within the Facilities portfolio. As such, NWFR has evaluated the General Services Administration's (GSA) and the Internal Revenue Service (IRS) maintenance standards and modified and adopted them for use at Ross and within the CFT. These standards have also been made available to TF for use in the Field. However, the effective execution of these standards will take resources much greater than the current average O&M funding at Ross, (NWFR) Critical Facilities (NWFC) and Transmission Field (TF) of $11M annually and another $11M annually for deferred maintenance projects (NWM) totaling $22.6M annually in support of Non-energized Facilities..

The Facilities industry has developed a benchmark known as the Facility Condition Index, or FCI. The FCI is the ratio of deferred maintenance dollars to replacement dollars and provides straightforward comparison and condition monitoring of an organization's key assets. FCI Video The FCI can also be viewed as a proxy for relative risk. That is, the worse condition a facility is in, the greater the likelihood of failure or impacts to operations. Currently, our VFA database indicates a portfolio average Facility Condition Index (FCI) of .17 (anything greater than .10 is considered poor) with a BMAR of $122M and a Current Replacement Value (CRV) of just under $719M.

FCI is also used as a lagging indicator for the effects O&M has on condition and Return on Investment (ROI). Effective O&M will drive down or maintain the FCI at desired levels and facilitate the asset meeting or exceeding its anticipated lifecycle while inadequate O&M will see the FCI and risks rise to unacceptable levels and premature asset and system failures. Modern Capital planning and condition monitoring tools, (NWM uses VFA Facility) can also forecast the relationship between O&M and condition and should be used to drive optimal resourcing/budgets/replacements vs. trying to fit an O&M program into arbitrary funding levels.

FUNDING VS. FCI REPORT



The chart above shows the effects that various funding levels have on the portfolio average FCI. The current FCI of 0.17 is already considered extremely poor and at the current FY16 investment levels of $26.2M and an inflation rate of 3% annually, will fall to 0.40 by FY30 and represent a BMAR of over $434M.

Conversely, to target and achieve a rather low portfolio average FCI of just .10 will take an investment ranging from $35M in FY17 to $55M by FY30.

In lieu increases in capital investments (Major unit replacement), higher level investments in the reconciliation of the backlog of maintenance and repairs (expense budget repairs/replacements) and the creation, resourcing and implementation of an Agency wide O&M program, NW predicts:

- A continuation of more costly break-fix/emergency repairs and system failures that could affect the reliability of the grid or unacceptable life safety issues.
- Loss in anticipated benefit (Lifecycle/ROI) of facilities investments due to shortened lifecycles and premature failures.

INTERIOR AND SPACE STANDARDS

BPA has established:

1. Interior finishes standards (Carpet, Paint, Laminate, etc.) located in NWM share point site under design standards
2. Workstation space standards BPAM 1037 policy
3. Interior and Exterior signage standards located in NWM share point site under design standards

4. BPA interior code standards

Interior and space standards yet to be approved:

1. Conference and training room standards
2. Hard wall room construction standards
3. Executive suite furniture standards

MATERIAL STANDARDS

The existence of system components within the built environment that serve the same function(s) but are of differing sources/design/manufacturer, adds unnecessary overhead and cost in terms of spare parts, training, specialized tools, training, etc. Currently, the Critical Facilities Team (CFT) is beginning to standardize among asset systems and equipment. This includes using the same manufacturer for electrical panels, switchgear, and Uninterruptable Power Supplies (UPS). This also includes having the same HVAC System setup at Headquarters and DCC and, in the future, Z992 and Munro. This initiative will endeavor to leverage and expand upon this effort across the facilities portfolio. Additionally, NWM is working with folks from TE, IT and others to establish standards for Building Automation systems and Fire Protection systems.

INITIATIVE EXECUTION RISKS

Risk:	Maintenance standards are not adopted and/or adequately resourced				
Risk Group:	Transmission Asset Health				
Owner/Control	NW/TE/TF				
Consequence:	4	Likelihood:	3	Risk Score:	.20-High

Risk:	**Facility standards are not adopted and/or consistently implemented due to a lack of "buy in"**				
Risk Group:	**Transmission Asset Health**				
Owner/Control	**NW/TE/TF**				
Consequence:	4	**Likelihood:**	3	**Risk Score:**	.20-High

Risk:	**A lack of effective, comprehensive design and service standards undermines the credibility of program needs and negatively effects funding levels.**				
Risk Group:	**Capital Availability and Prioritization**				
Owner/Control	**NW/TE/TF**				
Consequence:	4	**Likelihood:**	3	**Risk Score:**	.20-High

1B. IMPROVE TRACKING OF INFRASTRUCTURE INVESTMENT

With the establishment of these enhanced Standards Workplace Services is adding several new service, maintenance, repair and performance metrics to track capital and expense expenditures required to maintain the agreed upon service levels for BPA facilities. This will enable Workplace Services to understand the true cost for providing consistent service levels to facility occupants and

identify investment opportunities for more efficient facility/systems replacement for ongoing cost avoidance.

INITIATIVE EXECUTION RISKS

Risk:	If the information that drives the various performance metrics is missing or inaccurate, it becomes very difficult to correctly prioritize and staff needed work and to forecast staffing levels.				
Risk Group:	Workload/Resource Balancing				
Owner/Control	NW/TE/TF				
Consequence:	4	Likelihood:	5	Risk Score:	.36-High

Risk:	Inefficient staffing and/or incorrect prioritization of resources, leads to a deterioration of our assets.				
Risk Group:	Transmission Asset Health				
Owner/Control	NW/J/NH				
Consequence:	4	Likelihood:	5	Risk Score:	.36-High

1C. DEVELOP ASSET MANAGEMENT SERVICES

PEOPLE

As reported in the BPA Asset Management Enterprise Process Improvement Plan (EPIP), Facilities Asset Management (NWM) was formed in 2006 and is responsible for the planning and oversight of BPA facilities. Much progress has been made across the BPA in developing asset management skills and capacity. However, the personnel performing building operations and maintenance, energy management, sustainability, water efficiency, safety (including electrical safety), building performance measures and design functions across the Agency come from many professions including engineers, architects, and facilities specialists. For these reasons, there remains an opportunity to develop a generalized standard of practices and competencies for said asset management practitioners.

Continuing technological advances in Facilities Management and building systems such as Building Information Management (BIM), Building Automation, Energy management, variable speed drives (VSD), programmable logic controllers (PLC), Security and other systems, has served to point out the need for a Facilities Professionals training program. NWM will initiate work on developing staff in accordance with the competencies set forth in the Federal Buildings Personnel Training Act (FBPTA) of 2010. (link) As part of continuing to enable the practice of asset management, NWM will continue to monitor needs, provide tools and support in the areas of succession management, knowledge management and skills development, change management and communication.

TOOLS AND DATA

An important area for ongoing development is implementation of standardized tools supporting asset management processes. By integrating the various systems together we will be able to make more informed infrastructure decisions on behalf of BPA. To facilitate this, the following tools are being developed and/or implemented:

ENTERPRISE ASSET REGISTRY

- Develop risk assessments for asset failures, capacity or functional inadequacy, technological obsolescence, and other risks;
- Create and validate equipment failure curves;
- Prioritize replacements and maintenance actions so that maintenance and replacements can be timed and targeted to greatest benefit;
- Quantify maintenance and replacement backlogs, and optimize plans for alleviation;
- Create asset performance objectives, metrics and targets, and monitor and enable reporting;
- Justify proposed investment levels in budgets, asset strategies, and business cases;
- Monitor the completion of scheduled replacement, maintenance and other tasks;
- Enable information for the development of life cycle cost analyses;
- Supply the asset accounting process with needed asset information more efficiently;
- Provide data to inform the development of depreciation studies;
- Provide the data necessary to inform and drive the IPR such as the Asset Data Refresh (VFA) project.
- Provide the data necessary to document compliance with various regulatory requirements such as:
    - EO 13327 Federal Real Property Asset management
    - EO 13514 Federal Leadership in Environmental, Energy and Economic Performance
    - CFR 41 Part 102-84 Annual Real Property Inventories
    - OMB directive m-12-12 "Freeze the Footprint"

LIFE CYCLE COST AND CAPITAL PLANNING

Standardized tools for calculating the Total Cost of Ownership (TCO) for assets.

REPORT AUTOMATION

Work is underway to automate reporting of standardized facilities asset, maintenance and budget status reports for broad dissemination within BPA.

DATA STANDARDIZATION

BPA facilities data standards will be established with standardized values required for asset reporting and prioritization. Such values shall also include those necessary for resource management tracking (energy, water, materials, greenhouse gas emissions, etc.) which support asset operational and environmental sustainability.

STANDARDIZED COMPUTER MAINTENANCE MANAGEMENT SYSTEM (CMMS)

Facilities Asset Management has proposed a project for a CMMS since FY11 which, up until FY14, had yet to successfully compete for IT resources. As such, NWM, NWFC and NWFR created and implemented an interim Computerized Maintenance Management System (iCMMS) based on SharePoint and Microsoft Access, to bridge the gap until BPA decides on the implementation of an enterprise CMMS. The Facilities CMMS project was approved by the ACPRT in June 2014 but was subsequently placed on hold due to funding challenges the Agency is currently dealing with.

INITIATIVE EXECUTION RISKS

Risk:	If the data systems that track the health and efficacy of our assets are missing or inadequate, already constrained resources could be expended on the wrong things.				
Risk Group:	Workload/resource balancing				
Owner/Control	NW/J				
Consequence:	4	Likelihood:	5	Risk Score:	.36-High

Risk:	If resources are inaccurately targeted, higher priority work is not completed and the assets deteriorate. Or, if the highest priority work is accurately identified but technical skills are not optimal due to inadequate training programs, the assets could deteriorate.				
Risk Group:	Transmission Asset Health				
Owner/Control	NW/J/NH				
Consequence:	4	Likelihood:	5	Risk Score:	.36-High

Risk:	Incomplete, inaccurate or missing data about our facilities makes Continuity planning and disaster recovery, very difficult				
Risk Group:	Business Continuity				
Owner/Control	NW/J/TE/NN				
Consequence:	4	Likelihood:	5	Risk Score:	.36-High

2. OPERATIONAL ALIGNMENT

Comprehensively integrate Facilities initiatives and projects with other asset categories to the maximum extent practicable.

2A. ENABLE INTEGRATED INFRASTRUCTURE DECISION MAKING

Ongoing staff development along with the maturation of the facility data and systems will represent a huge advance in the development and execution of the facilities program. However, additional efficiencies can and should be realized via close coordination with other facilities strategic partners.

NWM has successfully established regular working sessions with Transmission Planning (TPO) to this end. Program Managers from both groups come together once a quarter to share proposed projects with the intents of coordinating activities in ways that leverage economies of scale and that minimize operational impacts. NWM is currently integrating Securities projects into the portfolio of projects considered at these meetings as well. NWM intends to establish similar forums with our strategic partners in other areas such as IT, Safety and Environmental.

INITIATIVE EXECUTION RISKS

Risk:	Inter-departmental communications and planning is not effective due to a lack of buy in, workload or other factors resulting in either missed opportunities for project synergies or unnecessary work.				
Risk Group:	Workload/Resource Balancing				
Owner/Control	NW/TF/TE				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

2B. ESTABLISH PARTNERSHIP AGREEMENTS

In 2013 Facilities Asset Management established Partnership Agreements with Transmission Engineering partner organizations in order to clarify roles and responsibilities and promote efficient workflow (see Appendix A-4). This represents a major milestone towards maturing the BPA structure for facilities planning and project execution. Additional Partnership Agreements have also been established with TF, IT, Security, Energy Efficiency, Environmental and Supply Chain.

INITIATIVE EXECUTION RISKS

Risk:	Continuing underperformance of the work plans undermines program credibility and has a negative effect of funding levels.				
Risk Group:	Capital Availability and Prioritization				
Owner/Control	NW/TE/TF				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

2C. ESTABLISH ASSET MANAGEMENT PLANS

Facilities Asset Management established an Asset Management Plan (AMP) for critical assets at the Dittmer Control Center. This model will serve as a basis for further implementation within the Critical Facilities portfolio. Additional AMP will be developed for the remainder of the facilities portfolio as appropriate. In some cases, asset specific AMP's are appropriate, in other cases, complex-wide or portfolio-wide AMP's will be developed.

INITIATIVE EXECUTION RISKS

Risk:	Management plans are not in place and/or not adequately aligned with other asset category plans leading to uncoordinated and unnecessary work.				
Risk Group:	Workload/Resource Balancing				
Owner/Control	NW/J/TE/T				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

Risk:	The execution of uncoordinated and/or unnecessary work undermines the program credibility and has a negative effect on funding levels.				
Risk Group:	Capital Availability and Prioritization				
Owner/Control	NW/J/TE/TF				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

3. ASSET LIFE CYCLE MANAGEMENT

BPA's Asset Management Policy (BPAM Chapter 660) states that leading industry practices such as the British Standards Institute, Publically Available Specification 55, will become the basis for asset management practices and use a Plan-Do-Check-Act cycle. The initiatives in this section are generally aimed at the "Check-Act" part of this constant process improvement cycle.

3A. ESTABLISH ASSET MANAGEMENT PROCESSES

The Workplace Services Facilities Asset Management Strategy is intended to act as the reference AMS for all BPA facilities infrastructure. Practice and performance expectations, as well as responsibilities, of the Facilities Asset Management program continue to evolve. As such, this strategy and its sub-components will require regular updates to align and respond to emerging operational needs.

INITIATIVE EXECUTION RISKS

Risk:	The forecasting and implementation of resources and staff may not be optimal if the strategy is not updated to reflect changes in the business environment.				
Risk Group:	Workload/Resource Balancing				
Owner/Control	NW				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

Risk:	If the strategy is not updated to reflect change in the business environment, funding levels could become inadequate.				
Risk Group:	Capital Availability and Prioritization				
Owner/Control	NW				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

3B. CONTINUALLY IMPROVE THE ASSET MANAGEMENT PROGRAM

RESOURCING – CONTRACTING STRATEGY

There is no denying that in order to deliver the comprehensive, cradle to grave, asset management program currently being developed; more resources will be required; especially in the areas of addressing the BMAR and day to day O&M. Given the current political and fiscal realities, there is also no doubt that the vast majority of these resources will be contractors and/or contracted service.

In the Spring of 2015, 13 General Contractor Master Agreements, known as MATOC, were put in place primarily due to NWM working with our partners in Supply Chain (NSSV). These are intended to bundle many smaller, non-routine O&M tasks into one release up to $2M at a time and are intended to move through contracting more quickly while lessening the burden on NWM and NSSV staff in processing hundreds of smaller contract actions.

In addition, other execution options are being considered including:

ALTERNATIVE 1 - Generate a limited number of MASTER Contract's related to specific

maintenance and/or services utilizing geographic vendors. These contracts could be easily replicated for use in the various transmission districts or regions using local service vendors. This approach would reduce administrative and travel costs.

ALTERNATIVE 2 - Pursue a Performance Based Contract (PBC) solution, something new at BPA. There are certain key characteristics that make performance-based contracts different from other contract forms used by the Agency. The concept of PBC is centered on a contract instrument that defines performance expectations in terms of outcomes or results as opposed to methods, processes, systems or broad categories of work activity. To the maximum extent possible it describes the work in terms of what is to be the required output rather than how the work is to be accomplished.

RESOURCING – SPARE PARTS STRATEGY

Whether one is dealing with a planned component replacement (preventive maintenance) or a break-fix repair (reactionary maintenance), having ready access to the parts and materials required is key to the execution of an effective maintenance/asset management program. This in turn leads to increased failure rates and equipment downtime, as well as reduced productivity and efficiency.

There are two basic approaches to a spare parts strategy: Order it when you need it or have stock on hand/on the shelf. However the cost vs. effectiveness of these two approaches needs to be considered. In general, the greater the operational criticality of a part is and the longer it takes to acquire, the more likely it should be held as inventory on hand. However, if failure of the part is predictable or has minimal negative effects and/or is readily available, the more likely it should be ordered when needed (Note: An effective planning and scheduling function starts to tip the scales even more towards acquisition when required).

While currently more of a pre-expensed bench stock than a true inventory spare parts function, the Critical Facilities Team (CFT) is beginning to stock a limited quantity of spares parts at the sites to provide a readily available source of replacement parts in which to repair equipment whose failure would render a critical facility inoperable over an extended period. Parts will be under the control of the Critical Facilities Team at each location. As spares are used to repair failed equipment, sites will immediately report their use to the CFT for replenishment or repair of the failed component/part. Absent of a true CMMS, development of an inventory database to document the current inventory and updating the inventory as new parts is underway.

ASSET MANAGEMENT PLANS

- Asset management practice performance measurement, internal review and checking.
- Benchmarking infrastructure investment, service provision and risk management to other industry organizations and federal agencies.

INITIATIVE EXECUTION RISKS

Risk:	The forecasting and implementation of resources and staff may not be optimal if the program is not updated to reflect changes in the business environment.				
Risk Group:	Workload/Resource Balancing				
Owner/Control	NW				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

Risk:	All long term, strategic objectives will be negatively impacted if the personnel that manage and implement the program do not possess the required core competencies.				
Risk Group:	Talent Adequacy				
Owner/Control	NW/NH/TE/TF				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

Risk:	If the program is not constantly reviewed and updated to reflect change in the business environment, funding levels could become inadequate.				
Risk Group:	Capital Availability and Prioritization				
Owner/Control	NW				
Consequence:	4	Likelihood:	4	Risk Score:	.28-High

STRATEGIC RISK ASSESSMENT

The risks of executing the various Strategic Initiatives contained in this Strategy, were assessed as to their impacts on the Top Agency Risks, in accordance with agency risk methodology as follows:

STRATEGIC INITIATIVE EXECUTION RISKS

		ENTERPRISE RISKS (BPA)										
		TOP TIER								OTHER		
		Changing Business Environment	Workload / Resource Balance	Talent Adequacy	Transmission Asset Health	Regulatory & Compliance	Capital Availability & Prioritization	HCM Compliance	EIM / Market Redesign	Business Continuity	Cascadia Subduction Zone (CSZ) Earthquake	Cyber Attack
STRATEGIC INITIATIVES (WORKPLACE SERVICES)	*1. Prioritized Asset Optimization*	n/a	●	● ○	●	●	●	○	n/a	●	●	n/a
	1A. Service Level Standards	-	.10	.10	.20	.02	.20	.03	-	.10	.08	-
	1B. Improve Tracking of Infrastructure Investment	-	.36	.10	.36	.14	.14	-	-	-	-	-
	1C. Develop Asset Management Services	-	.36	.28	.36	.14	.14	.03	-	.36	.24	-
	2. Operational Alignment	n/a	●	●	●	● ○	●	n/a	n/a	●	●	n/a
	2A. Enable Integrated Infrastructure Decision Making	-	.28	.03	.10	.05	.14	-	-	.10	.03	-
	2B. Establish Partnership Agreements	-	.28	.03	.10	.03	.28	-	-	.10	.03	-
	2C Establish Asset Management Plans	-	.28	.03	.10	.05	.28	-	-	.10	.03	-
	3. Asset Life Cycle Management	n/a	●	● ○	● ○	●	●	n/a	n/a	●	○	n/a
	3A. Update the Asset Management Strategy	-	.28	.10	.10	.03	.28	-	-	.10	.03	-
	3B. Continually Improve Asset Management System	-	.28	.28	.10	.03	.28	-	-	.10	.03	-

● *Direct Influence* ○ *Indirect Influence*

III. INVESTMENT RECOMMENDATIONS

Facilities Planning and Project's (NWM) immediate investment priorities are to cost-effectively address BPA's backlog of deferred maintenance, maintain the health of non-distressed assets and provide reasonable facility solutions for emerging business needs. Expenditures will be weighted towards sustainment projects reflecting the size and number of facilities in need of capital renewal. Determination of this weighting is based on two factors:

1. BPA follows the Department of Energy's use of the Facility Condition Index (FCI). This metric uses the cost of maintenance; repair and replacement deficiencies for a given facility to derive a score that can be benchmarked against industry baseline standards (see Metrics of this Asset Plan for targets). Based on known database maintenance requirements, the Agency facility portfolio has an average FCI score of 0.20. FCI scores above 0.10 are considered poor by accepted industry standards. Although this is a blended score giving equal weight to different facility types, the magnitude of deviation from any acceptable standard of facility health is indicative of the current state of BPA structures. FCI scoring can be aggregated to quantify the overall state of BPA's facilities as well as a prioritization tool through a facility-by-facility approach. As NWM continues to conduct facility condition assessments, the FCI metric will become a more prominent and valuable tool for the forecasting and modeling of resource allocation and support of the long-term health and value of BPA assets.

2. The total value of BPA's facility assets in the five state territories is estimated to be $1.3 billion. The established industry standard for facility renewal is between 2-3% of the replacement value which equates to a minimum of $26 million per year. This reflects the expenditures necessary to maintain a reasonable level of health for a facility portfolio in fair condition. However, because BPA's facility portfolio is in poor condition, the baseline maintenance costs have an added premium which includes the backlog of maintenance and repair. As mentioned in other parts of this strategy, the cost of addressing baseline O&M plus deferred maintenance actions over a 20 year time period is estimated to be over $50M in annual facility funding.

Long-term deferment of funding to baseline facility renewal and maintenance for a portfolio of this size include:

- Backlog deterioration: Assets of poor health will deteriorate faster than assets in fair condition. This makes prolonged deferment of maintenance actions a more costly lifecycle option.
- Future affordability: The RS Means construction index 30-year average inflation rate is 3.34% which is higher than materials escalation costs alone. The persistence of construction inflation despite periods of low construction activity highlights that future affordability can be significantly under forecasted if not properly escalated.
- Reduced efficiency and capability of BPA operations
- Reduced employee engagement

Given the capital resources available at the Agency level for the foreseeable future, the above points support the view that, while successful execution of high value expansion projects is an important component supporting BPA operations, sustainment of existing assets is the overriding priority that will drive the majority of investment decisions.

NWM estimates expensed asset upgrades, replacements, renovations and repairs to average $30 million per year for FY16-30. Expected capital investments are estimated to average $27 million per year over the next 15 years. This reduction from the FY13-24 asset strategy forecast reflects a reduction in available funding.

RECOMMENDED CAPITAL PROJECTS

MAINTENANCE HEADQUARTERS CAPITAL RENEWAL AND STANDARDIZATION PROGRAM

Project	Construct	Cost*	Status
Ross MHQ	FY17	$15.6M	In-Flight
Covington MHQ	FY20	$24.3M	Planned
The Dalles MHQ	FY22	$19.9M	Planned
Snohomish MHQ	FY24	$18.4M	Planned
Redmond MHQ	*FY22*	*$28.2M*	*Deferred due to funding. Awaiting expense alt analysis*
North Bend MHQ	*FY17*	*$19.9M*	*Deferred due to funding in favor of remodel and seismic retrofit.*
Lewiston MHQ	*Not Scheduled*	-	*Deferred to FY29 due to funding constraints*
Grand Coulee MHQ	*Not Scheduled*	-	*Deferred due to funding in favor of status quo*

* Real costs shown at mid-point of construction, direct capital

ROSS COMPLEX STRATEGIC FRAMEWORK PLAN CAPITAL REPLACEMENT PROJECTS

Project	Construct	Cost*	Status
Ross Circ. Improv.	FY16-22	$16.2M	Projects in-flight and in planning
Ross Garage	FY18-20	$26.0M	Seeking authorization in FY16
Cld. Creek Crossing	FY18	$2.8M	Planned
Office #1	*FY25-26*	*$65.3M*	*Deferred due to funding in favor of lease alternative*
Office #2	*Not Scheduled*	-	*Deferred due to funding in favor of lease alternative*
Warehouse Addn	*FY20-21*	*$6.8M*	*Deferred due to funding constraints*
N Amp Replace	*FY23*	*$17.5M*	*Deferred due to funding in favor expense alternative*
S Amp Replace	*FY21*	*$18.1M*	*Deferred due to funding in favor expense alternative*
DCC Replacement	*FY28-29*	*$111.6M*	*Deferred due to funding constraints*
IRC Relocate	*Not Scheduled*	-	*Deferred due to funding constraints*

* Real costs shown at mid-point of construction, direct capital

SMALL CAPITAL RENEWAL PROJECTS AND SYSTEM REPLACEMENTS

Project	Construct	Cost*	Status
Garrison Storage Blg.	FY17-18	$.89M	Project authorized
Lookout Mtn. RS	FY18-19	$1.0M	*Deferred due to funding constraints*
Bell Septic Replace.	FY16-17	$.48M	In progress
Bell SS Upgrade	FY16-17	$4.9M	Project authorized
Ross SS Upgrade	FY18-19	$7.0M	In planning

HAZMAT ABATEMENT & DEMOLITION

Project	Construct	Cost*	Status
Anaconda Abatement	FY16-22	$.2M	*Authorized but deferred to FY18 due to funding constraints*
Longview Maint. Demo	FY16	$.1M	*Authorized but deferred to FY18 due to funding constraints*
Sandpoint Maint. Demo	FY16	$.1M	*Authorized but deferred to FY18 due to funding constraints*
Keeler Admin Demo	FY16-17	$.16M	*Authorized but deferred to FY18 due to funding constraints*
Addy Sub. Demo	FY17	$.1M	In planning
Creston Stor. Demo	FY17	$.1M	In planning

* Real costs shown at mid-point of construction, direct capital

PROPOSED CAPITAL PLAN, FY 2017 – FY 2030

(All figures shown in millions of dollars)

CAPITAL PROGRAM	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	15-YR TOTAL
Core SUSTAIN	**2.4**	**2.9**	**5.8**	**3.6**	**7.3**	**11.7**	**20.0**	**23.5**	**19.0**	**24.0**	**8.0**	**8.2**	**4.7**	**4.9**	**5.0**	**5.2**	**5.4**	**150.5**
Small Capital Projects	0.3	0.3	3.1	0	6.5	4.2	3.1	3.3	3.3	3.4	7.1	7.1	3.6	3.8	3.9	4.0	4.1	57.4
HazMat//Demo	0.2	0.2	1.0	.0	.5	.5	.6	.6	.6	.6	.6	.6	.6	.7	.7	.7	.7	8.0
Maintenance HQs	0	0	.0	.0	.0	2.3	11.0	12.9	6.0	12.0	.0	.0	.0	.0	.0	.0	.0	44.2
Ross SFP - Bldg Replacements	0	0.7	1.4	3.6	.0	.0	2.8	6.4	8.8	7.7	.0	.0	.0	.0	.0	.0	.0	29.3
Critical Facilities	1.9	1.9	.3	.0	.0	.0	.3	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	4.5
Ross SS Upgrade	0	0	0	0	.4	4.6	2.1	0	0	0	0	0	0	0	0	0	0	7.0
Non-Core SUSTAIN	**2.4**	**2.4**	**2.5**	**.0**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**16.1**
HQ Capital Projects	2.4	2.4	2.5	.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	16.1
Non-Core SUST. (Compliance)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Security Upgrades	Program may shift from Security (NNT) to Facilities (NWM) in future FY. Funding included in Security Strategy																	
TOTAL SUSTAIN CAPITAL	**4.8**	**5.3**	**8.3**	**3.6**	**8.5**	**12.9**	**21.1**	**24.7**	**20.3**	**25.2**	**9.3**	**9.4**	**6.0**	**6.2**	**6.3**	**6.5**	**6.7**	**166.6**
In-Flight EXPAND	**33.4**	**11.0**	**3.2**	**2.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**.0**	**2.0**
Business Continuity	15.0	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Maintenance HQ's	18.4	7.7	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bell SS Upgrade	0	0.2	2.7	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0
EXPAND	**0**	**0**	**2.4**	**16.3**	**9.4**	**22.1**	**1.1**	**1.2**	**5.5**	**2.7**	**2.8**	**13.0**	**9.8**	**50.7**	**52.5**	**7.3**	**7.3**	**201.7**
Ross SFP - Bldg Replacements	0	0	.5	3.2	9.2	22.1	.0	.0	.0	.0	.0	.0	9.8	50.7	50.7	.0	.0	145.8
Maintenance HQs	0	0	1.9	13.1	.2	.0	1.1	1.2	5.5	2.7	2.8	13.0	.0	.0	1.8	7.3	7.3	55.9
TOTAL EXPAND CAPITAL	**33.4**	**11.0**	**5.6**	**18.3**	**9.4**	**22.1**	**1.1**	**1.2**	**5.5**	**2.7**	**2.8**	**13.0**	**9.8**	**50.7**	**52.5**	**7.3**	**7.3**	**203.7**
TOTAL CAPITAL	**38.2**	**17.2**	**13.9**	**21.9**	**17.9**	**35.0**	**22.2**	**25.9**	**25.8**	**27.9**	**12.0**	**22.3**	**15.8**	**56.9**	**58.9**	**13.8**	**14.0**	**370.3**

EXPENSE ALT.	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	10-YR TOTAL
Ross SFP Expense Alternatives			**0**	**0**	**6.4**	**0**	**8.7**	**4.7**	**4.7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24.5**
Ross WHSE Seismic			0	0	6.4	0	0	0	0	0	0	0	0	0	0	0	0	6.2
AMPS Renovation			0	0	0	0	8.7	0	0	0	0	0	0	0	0	0	0	8.7
AMPN Renovation			0	0	0	0	0	4.7	4.7	0	0	0	0	0	0	0	0	9.4
Office Bldg. #2			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
MHQ Expense Alternatives			**0**	**2.2**	**2.2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4.4**
North Bend MHQ			0	2.2	2.2	0	0	0	0	0	0	0	0	0	0	0	0	4.4
Lewiston MHQ			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Grand Coulee MHQ			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
TOTAL EXPENSE ALTERNATIVES	**0**	**0**	**0**	**2.2**	**8.6**	**0**	**8.7**	**4.7**	**4.7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**28.9**

RECOMMENDED EXPENSE PROJECTS

The expense investment plan includes funding for:

1. Evaluating existing conditions to address the backlog of maintenance and repair
2. Continue base level maintenance
3. Funding for facility-related business continuity initiatives, including the implementation of facilities seismic hardening program
4. One time and ongoing expense costs for new building projects

CURRENT EXPENSE PROJECT DESCRIPTIONS

FACILITY MANAGEMENT AND REPAIR

1. Emergency/Unplanned Building Repairs and Building renovations (BPA-wide) - This is a continuing project for the critical repair, renovation, remodeling and upgrading of various facilities throughout BPA. Requirements include abatement of health or safety hazards and emergency or unanticipated repairs of building systems or components.
2. Stormwater drainage system evaluation and repairs (Select BPA Sites) - Storm water back-ups into substation yards due to failure to inspect and clean storm drain system outfalls, swales and drainage vaults. These failures have also been caused by adding new impervious surfaces which drain into existing, under-sized systems which becomes overwhelmed during heavier runoffs. These projects assess the situation and recommend a plan for implementing a solution.
3. Xeriscaping (Select BPA sites) - Four sites were identified to implement xeriscaping in accordance with the Irrigation policy. In order to comply with this policy, changes will be made to the irrigation system and landscaping so less water and maintenance effort is required to support the landscape.
4. Metering (BPA Wide) - These projects aim to implement utilities metering (energy, water, gas) at all facilities wherever practicable by the end of calendar (CY) 2016. The Agency understands that metering and reviewing energy consumption is fundamental to successfully managing and ultimately reducing utility infrastructure loads.

PREVENTATIVE MAINTENANCE

Maintaining and operating systems requires proactive service and support options to help drive the highest system availability. The objective of any preventative maintenance program is to prevent unplanned, reactive maintenance. To accomplish this, maintenance personnel must have a working knowledge of the equipment, its required maintenance, and the spare parts to be stocked. There must be an effective system to inform the staff of the priorities and frequency of maintenance which need to be done. A record of the repairs made to each piece of equipment should be kept. This allows the program managers to make appropriate judgments about the maintenance program, the quality and condition of equipment, and when replacement should be planned.

LOW COST/NO COST OPPORTUNITIES

Below is a list of opportunities with little to no cost for implementation, resulting in energy savings.

LIGHTING – Replace ineffective and inefficient lighting with new energy saving fixtures and/or lamps. Energy incentives reduce the payback to .5 years for station serviced sites and 2-5 years for those sites served by Public Utilities. Projects are underway at several BPA sites.

WATER USE REDUCTION/IRRIGATION POLICY – Test the integrity of our site water systems to identify and repair water leaks from broken pipes and toilets. Also the Irrigation Policy, which was adopted in June 2013, minimizes, and in some cases eliminates, the use of potable water for irrigation. Both items see less than a year payback 95% of the time.

REPLACEMENT AND RENEWAL

Office/MHQ Facilities Renewal (BPA-wide) - The Site Evaluation Reports (SER) Program evaluates the major systems of a facility consisting of non-building assets, structural, architectural, mechanical, electrical, plumbing, conveying systems (elevators), fire and life safety, and sustainability including evaluations of specific elements within each system. Each area will be evaluated to determine if there is sufficient physical evidence, including life cycle cost analysis, to warrant replacement of the building system or if repair is recommended. This evaluation will be used as a basis for evaluating and addressing deferred maintenance and future renewal costs. The recommendations will be developed into work packages for execution by our strategic partners.

REPLACEMENT UPON FAILURE

Projects for repairs and replacements at BPA facilities in the event of a major systems failure, such as a large HVAC system or other unforeseen event, are ongoing. If a system failure should occur, there is the potential that a BPA facility may shut down, suspending services to residents and disrupting BPA business. Although BPA's emphasis on capital renewal and preventative maintenance is intended to ensure these kinds of interruptions are avoided, funding will enable potential disruptions to be corrected in a timely manner.

PROPOSED EXPENSE PLAN, FY 2017 – FY 2030

(All figures shown in millions of dollars)

EXPENSE PROGRAM	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	15-YR TOTAL
Facility O&M (T & NW)	**21.3**	**32.2**	**26.3**	**34.0**	**34.7**	**34.9**	**35.6**	**36.3**	**37.0**	**37.7**	**38.5**	**39.3**	**40.1**	**40.9**	**41.7**	**42.5**	**43.4**	**536.4**
(TE) Eng. Services	.8	.6	.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	15.2
(TF) Field Facility O&M	6.0	5.3	5.0	5.7	5.8	6.0	6.1	6.2	6.3	6.5	6.6	6.7	6.9	7.0	7.1	7.3	7.4	91.6
(TO) Control Center O&M	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3
(NW) O&M	14.2	24.6	20.3	27.3	27.8	27.9	28.5	29.0	29.6	30.2	30.8	31.4	32.0	32.7	33.3	34.0	34.7	429.3
Steady State Corp. Leases	**15.2**	**15.1**	**21.8**	**22.2**	**22.6**	**22.9**	**23.3**	**23.7**	**24.2**	**24.6**	**25.1**	**25.6**	**26.1**	**26.6**	**27.1**	**27.7**	**28.2**	**349.8**
TOTAL EXPENSE	**36.5**	**47.3**	**48.1**	**55.7**	**56.7**	**57.8**	**58.9**	**60.0**	**61.2**	**62.3**	**63.6**	**64.8**	**66.1**	**67.5**	**68.8**	**70.2**	**71.6**	**886.2**
Facility Renewal Expense	.0	.0	.0	2.2	8.6	.0	8.7	4.7	4.7	.0	.0	.0	.0	.0	.0	.0	.0	28.9
Leases In Lieu of Capital Investment	.0	.0	.0	.0	.0	5.6	5.0	5.1	5.2	5.3	7.6	7.9	8.0	8.2	8.3	8.5	8.7	83.5
Exp. Alts to Capital Projects	**.0**	**.0**	**.0**	**2.2**	**8.6**	**5.6**	**13.7**	**9.8**	**9.9**	**5.3**	**7.6**	**7.9**	**8.0**	**8.2**	**8.3**	**8.5**	**8.7**	**112.4**

SUMMARY OF RECOMMENDED INVESTMENTS

As set forth in the Executive Summary, the Strategic Facilities Objectives define NWM's overriding responsibility to support BPA mission requirements. The recommended projects and programs represent the highest need investments supporting these goals.

FORWARD VISION

As an enabling facilities partner to all BPA asset categories and steward of prudent asset management, the ability to sustain and appropriate BPA's existing asset base is NWM's highest priority. This position puts NWM and the BPA in best standing to successfully execute the Strategic Facilities Objectives for proposed investments. All recommended investments presented herein are driven in part or whole by the need to sustain BPA operations. They reflect a continued need to execute the objectives of asset optimization, operational alignment and efficient life cycle management vis-à-vis reactive development, maintenance and repair. To this end, expected benefits realized from successful execution of these investments include:

- Retained continuity of BPA mission critical operations
- Highest and best use of BPA facility assets
- Long-term reduction of base O&M costs
- Support for continued high level function of BPA internal operations
- Labor productivity gains via work environment optimization
- Improved management of non-facility assets/reduced need for future expansion
- Agency level risk mitigation (e.g. safety, code compliance, transmission reliability)

STRATEGIC CHALLENGES

The quality and capability of BPA facilities have a substantial impact on the benefits listed above and it is therefore imperative that NWM address the growing backlog of deferred maintenance. The primary challenge moving forward will be that of prioritization: balancing the need to retain and maximize the life of ageing assets while providing the best available options for cost-effective expansion projects serving our partners. These challenges are often simultaneously present in any given project. In addition to BPA capital constraints, NWM is challenged with appropriating its capital requirements in coordination with:

- Migration to improved data collection/management systems
- Execution of newly developed partnership agreements
- Staffing growth to manage current shortfalls, attrition and anticipated workload expansion.

To this end, NWM is adopting a measured approach which realizes both internal constraints and the realities of our current economic environment. As the Facilities Asset Management group continues to mature and expected capital availability increases in out years, expenditures addressing capital renewal and O&M will expand under planned programs currently in early stage execution or pre-implementation (*e.g. Maintenance Headquarters Program, Ross Strategic Framework Plan and Field Facilities O&M Program*).

The parallel challenge balancing investment with capital availability will be successful coordination and project execution with our allied partners, Facilities Engineering (TESF) and Transmission Project Management (TEP) under a newly formed partnership agreement. Substantial deferment of facility capital investment will impact not only NWM's ability to execute, but our allied partner's ability to forecast and manage workflow, retain skilled labor and operate as trusted partners.

As an agency tasked with the safe and reliable management of power generation and energy transmission, it cannot be overstated the extent to which BPA's $1.1+ billion in facility assets enable mission critical BPA goals. The Agency faces a number of long-term economic challenges; however, the Facility Recommended Investments represent minimum levels by which the BPA can continue to sustain our facility asset base and base O&M requirements moving forward. Repeated funding shortfalls pose an increased likelihood of failure to manage key agency risks associated with business continuity, life-safety and regulatory compliance. Given the size of our asset base, protracted funding cuts of both expense and capital needs may dictate that BPA will never reach a point of sustainment, directly impacting the Agency's cost of operations.

NWM's recommended capital and expense investment portfolio follows a measured, risk-based approach which realizes our current stage of maturation while addressing BPA's long-term need to direct facilities resources towards sustainment of its existing building stock. With limited capital, prioritization of asset optimization is anticipated to continue for the foreseeable future until BPA facility asset life cycle management overcomes the existing backlog of high priority structures and redirects investments towards preventative maintenance. The recommended 10-year facilities plan of Recommended Investments delineates the early phase path towards achieving this goal.

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APPENDICES

A-0 APPENDICES TRACKING

REVISION HISTORY				
NO.	DATE	SECTION	SUBMITTED	DESCRIPTION OF CHANGES
1.0	02/29/2016	ALL	B.WRIGHT	AMS submitted to Strategic Planning
2.0	06/01/2016	ALL	B. Wright	Final AMS submitted to Finance

Note: Multiple and significant changes should be characterized as a version change, e.g., 1.0 to 2.0, whereas minor changes should be characterized as a sub-version change, e.g., 1.1 to 1.2.

A-1 FACILITIES ASSET MANAGEMENT PLANS

Asset Management Plan creation is in various stages of development for Facilities Program Areas. Available information may be provided via the BPA intranet for internal audiences and by request for external audiences. Subsequent Asset Management Strategies will include further iterations of the following targeted Asset Management Plan areas:

FACILITIES MANAGEMENT PLAN

CRITICAL FACILITIES PROGRAM

SUSTAINABILITY ACTION PLAN

CONTROL HOUSES/RELAY HOUSE ASSET MANAGEMENT PLAN

MAINTENANCE HEADQUARTERS ASSET PLAN

COMMUNICATION BUILDING ASSET MANAGEMENT PLAN

STRATEGIC FRAMEWORK GUIDES

PORTLAND-VANCOUVER OFFICE SPACE STRATEGY

DEMOLITION/DECOMMISSION ASSET MANAGEMENT PLAN

HAZARDOUS MATERIAL ABATEMENT ASSET MANAGEMENT PLAN

BPA HEADQUARTERS ASSET MANAGEMENT PLAN

A-2 RISK/BENEFIT SCORE METHODOLOGY

RISK/BENEFIT SCORE METHODOLOGY

STEP 1A. ASSET CRITICALITY VALUE (2-10):
Weighted criticality value based upon the category of asset, e.g., Control Center, Control House, MHQ, Vehicle Storage, etc.

STEP 1B. SYSTEM CRITICALITY VALUE (2-10):
Weighted criticality value based upon the category of system, e.g., HVAC (D3020 Heat Generating Systems), Electrical/Lighting (D5020 Lighting and Branch Wiring), Interior finishes (C3010 Wall Finishes), etc.

STEP 1C. COMPOUND CRITICALITY VALUE (1-100):
Calculated value comprised of asset and system criticality; *(ASSET CRITICALITY VALUE X SYSTEM CRITICALITY VALUE)*

STEP 2. FACITILITY CONDITION INDEX (FCI) VALUE (0.00-1.00):
Calculated value of asset health from NWM Facilities Asset Registry; *{BACKLOG OF MAINTENANCE AND REPAIR (BMAR) / CURRENT REPLACEMENT VALUE (CRV)}*

STEP 3. RAW RISK/BENEFIT SCORE (4-100):
Calculated value comprised of consequences (criticality) and likelihood (facility condition index); *{(COMPOUND CRITICALITY VALUE X FACILITY CONDITION INDEX VALUE) = RAW RISK SCORE)}*

STEP 4. RISK/BENEFIT FACTOR VALUE (+/- 50):
Calculated adjustment value *(CONSEQUENCES X LIKELIHOOD = +/- 50)* for BPA Business Risks; (Strategic, Operational, Financial, Regulatory/Compliance, Hazard)

Value	*Consequences*	/	*Likelihood*	*Category*
(+/- 10-50)	*Extreme*	/	*Almost Certain*	*1*
(+/- 10-40)	*Major*	/	*Likely*	*2*
(+/- 0-30)	*Moderate*	/	*Possible*	*3*
(+/- 0-20)	*Minor*	/	*Unlikely*	*4*
(+/- 0-10)	*Insignificant*	/	*Rare*	*5*

STEP 5. RISK/BENEFIT SCORE (1-100):
Calculated value based upon the consequences (Criticality), likelihood (Facility Condition Index) and associated considerations (Risk Factor); *(COMPOUND CRITICALITY VALUE X FACILITY CONDITION INDEX VALUE) = RAW RISK SCORE +/- (RISK FACTOR VALUE) = **RISK/BENEFIT SCORE***

RISK/BENEFIT SCORE RANGES:	LOW	BALANCED	HIGH
	</= 8.99	>= 9 and <= 29.99	>/= 30

Figure STEP 1A

CATEGORY		ASSET TYPE	
1	UTILITY 1	Control Center Data Center	DC Converter Station Strategic Plans
2	UTILITY 2	Control House- Priority 1 Control House- Priority 2 Relay House Cable Tunnel	Radio Bldg Engine Generator Bldg Infrastructure / Utilities
3	OFFICE, MAINT. & SPECIAL	Office- Mission Essential Maintenance HQ Maintenance Shop	Storage- Special Storage- Vehicle Storage- Material & Equip.
4	STORAGE	Office- Mission Support Training & Research Meter House	Storage- General Storage- Site Utilities Storage- HazMat
5	OTHER	Untanking Tower Oil House Other	Lease Abandoned

Figure STEP 1B

CATEGORY		SYSTEM TYPE							
		A. SUBSTRUCTURE	B. SHELL	C. INTERIORS	D. SERVICES	E. EQUIPMENT & FURNISHINGS	F. SPECIAL CONSTR & DEMO	G. BUILDING SITEWORK	Z. GENERAL
SYSTEM CRITICALITY	1		B20: Ext. Enclosure B30: Roofing		D30: HVAC D40: Fire Protection D50: Electrical			G20: Site Improve G30: Site Mech Utility G40: Site Elec Utility	
	2		B10: Super Structure	C20: Stairs	D10: Conveying D20: Plumbing				
	3					E10: Equipment			Z10: Genera (Feasibility Stu
	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	

Figure STEP 1C

		COMPOUND CRITICALITY VALUE				
		LOW	MEDIUM	HIGH		
SYSTEM CRITICALITY	1 10	20	40	60	80	100
	2 8	16	32	48	64	80
	3 6	12	24	36	48	60
	4 4	8	16	24	32	40
	5 2	4	8	12	16	20
	VALUE	2	4	6	8	10
	CAT.	5	4	3	2	1
		ASSET CRITICALITY				

Figure STEP 4

		RISK/BENEFIT FACTOR VALUE				
		LOW	MEDIUM	HIGH		
LIKELIHOOD	1 ALMOST CERTAIN	10	20	30	40	50
	2 LIKELY	10	20	20	30	40
	3 POSSIBLE	10	10	20	20	30
	4 UNLIKELY	0	10	10	20	20
	5 RARE	0	0	10	10	10
	VALUE	INSIGNIF.	MINOR	MODERATE	MAJOR	EXTREME
	CATEGORY	5	4	3	2	1
		CONSEQUENCES				

Figure STEP 3

		RAW RISK/BENEFIT SCORE														
		LOW (< 8)	BALANCED (8-29)				HIGH (>/= 30)									
COMPOUND CRITICALITY VALUE (4-100)	HIGH 100	5	10	15	20	25	30	35	40	50	60	70	80	90	100	
	HIGH 80	4	8	12	16	20	24	28	32	40	48	56	64	72	80	
	HIGH 64	3.2	6.4	9.6	12.8	16	19.2	22.4	25.6	32	38.4	44.8	51.2	57.6	64	
	HIGH 60	3	6	9	12	15	18	21	24	30	36	42	48	54	60	
	MEDIUM 48	2.4	4.8	7.2	9.6	12	14.4	16.8	19.2	24	28.8	33.6	38.4	43.2	48	
	MEDIUM 40	2	4	6	8	10	12	14	16	20	24	28	32	36	40	
	MEDIUM 36	1.8	3.6	5.4	7.2	9	10.8	12.6	14.4	18	21.6	25.2	28.8	32.4	36	
	MEDIUM 32	1.6	3.2	4.8	6.4	8	9.6	11.2	12.8	16	19.2	22.4	25.6	28.8	32	
	MEDIUM 24	1.2	2.4	3.6	4.8	6	7.2	8.4	9.6	12	14.4	16.8	19.2	21.6	24	
	LOW 20	1	2	3	4	5	6	7	8	10	12	14	16	18	20	
	LOW 16	0.8	1.6	2.4	3.2	4	4.8	5.6	6.4	8	9.6	11.2	12.8	14.4	16	
	LOW 12	0.6	1.2	1.8	2.4	3	3.6	4.2	4.8	6	7.2	8.4	9.6	10.8	12	
	LOW 8	0.4	0.8	1.2	1.6	2	2.4	2.8	3.2	4	4.8	5.6	6.4	7.2	8	
	LOW 4	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	2	2.4	2.8	3.2	3.6	4	
	VALUE	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.5	0.6	0.7	0.8	0.9	1	
		GOOD			FAIR				POOR							
		FACILITY CONDITION INDEX (FCI) VALUE (0.00-1.00)														

A-3 CAPITAL PROJECT PRIORITIZATION

Investments projected to compete in Agency prioritization represent Facilities Planning and Project's best understanding of the cost based on the scope defined at this time. Upon project authorization, a formal investigation of each project is undertaken and the cost brackets are re-evaluated. The level of cost uncertainty at this time is reflected in the difference between the base and high cases noted below. These are notional figures and are regularly updated as more information becomes available.

SNOHOMISH MAINTENANCE HEADQUARTERS:

a. Base: $15.8M
b. High: $18.6M

Scope includes co-location facility and option for either new high bay in-line with the Strategic Plan or smaller vehicle high bay and remodel existing maintenance + storage structures. No new HMEM required for this project.

REDMOND MAINTENANCE HEADQUARTERS:

a. Base: $6.0M
b. High: $13M

This includes an administrative addition, an extensive remodel of the existing building, remodel of defunct heliport for regional auditorium/conference area (Redmond enjoys a central location so has frequent large meetings), upgrade mechanical and electrical building systems and construction of a standalone HMEM facility. Note: This project is being planned as a significant expense investment due to limited capital funding. The cost range is wide due to the number of development scenarios presently being studied.

LEWISTON MAINTENANCE HEADQUARTERS:

a. Base:$14.4M
b. High:$18.1M

This is a smaller scale MHQ but will require property acquisition. No HMEM support needed. The project will follow the MHQ Strategic Plan guidelines in most respects with the understanding that $2-$3.5M may be required for property acquisition, permits, and possibly extensive site development. The high cost scenario may be conservative but until property is identified, we will need a liberal cost bracket. Note: Project implementation is deferred until FY29 due to funding constraints.

DITTMER CONTROL CENTER REPLACEMENT:

a. Base:$80M
b. High:$120M

The Dittmer Control Center was originally commissioned in 1974 and is one of the original operating control centers in the United States. Control Center operations at Dittmer experience severe space constraints in the original footprint and the building has several known life-safety issues. This investment proposes a new dedicated facility which separates out non-essential functions and supports grid operations with modernized building systems and improved reliability.

A-4 REGULATIONS AND GUIDANCE

Workplaces Services is guided by the following list of regulations and guidance pertaining to the planning, design, construction, operations and maintenance of federal facilities.

FEDERAL REGULATIONS AND GUIDANCE

- National Historic Preservation Act of 1966
- Architectural Barriers Act (ABA) of 1968
- National Environmental Policy Act of 1970
- Federal Water Pollution Control Act of 1972
- National Energy Conservation Policy Act of 1978
- Americans with Disabilities Act of 1990
- Energy Policy Act of 1992
- Energy Policy Act of 2005
  Energy Independence and Security Act of 2007
- Executive Order 12072, *Federal Space Management*
- Executive Order 12196, *Occupational Safety and Health Programs for Federal Employees*
- Executive Order 13321, *Requirements for Energy Efficiency and Standby Power*
- Executive Order 13327, *Federal Real Property Asset Management*
- Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*
- Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*

BPA GUIDANCE

- BPA MHQ 10-Year Master Plan (June 2011)
- BPA Storm Water Management Design, STD-DS-000043
- BPA Code Manual: Code Compliance Evaluation for Existing Buildings (January 2011)
- BPA Physical Security Policy, STD-DS-000023-00-01
- BPA Seismic Requirements, STD-DS-000001
- BPA Manual, Chapter 1037: Office, Workstation and Furniture Standards
- BPA Interior Finish Standards, Ross Complex and Field Locations (April 2012)

FEDERAL PARTNER GUIDANCE

- U.S. General Services Administration, Site Selection Guide
- U.S. General Services Administration, Site Security Design Guide

INDUSTRY GUIDANCE AND STANDARDS

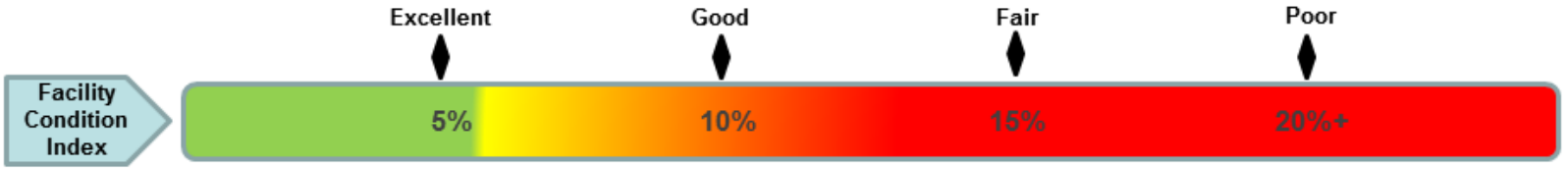
- ICC 2015 Family of codes (with IECC & IGCC Overlay to meet or exceed AIA 2030 Challenge)
- Fall Protection IAW ANSI Z359 (for Travel Restraint) and OSHA 1910.269
- Arc Flash IAW NFPA 70E and OSHA 1910.269 and 1926, Subpart V

Service Level Standards

(To be reviewed every 24 months)

Facility Strategic Objective	Performance Metric	Target	
1. Safeguard power system reliability 2. Safeguard health and safety of facility users 3. Productive work environment 4. Cost effective & Sustainable buildings 5. Maximize long term value 6. Optimize utilization	Safeguard of power system equipment	0 outages resulting from facility asset failure	
	Health and condition of facilities measured by Facility Condition Index (FCI) score FCI = Maintenance, Repair, and Replacement Deficiencies of the Facility / Current Replacement Value of the Facility	Critical systems	FCI of 0 to 5%
		Priority 1 assets	FCI of 5 to 10%
		Priority 2 & 3 assets	FCI of 10% to15%
		Priority 4 assets	FCI of 12.5 to17.5%
		Priority 5 assets	FCI of 15 to 20%+
	Reliability of critical facility systems and standby power systems	100% compliance (where standards apply) with "Data Center Facility & Infrastructure Standards" & "NFPA® 110 Standard for Emergency and Standby Power Systems"	
	Proactive and risk based maintenance	Critical System Preventative Maintenance Program's (PMP's)	Completed on schedule 95% of the time
		Non-critical PMP's	Completed on schedule 90% of the time
	Response time to building/system failure (See service request definitions in appendix)	Emergency service requests	Immediate response
		Urgent service requests	24 hour response
		Routine service requests	Scheduled
	Compliance with "Facilities Code and Energy Efficiency Policy" and BPA safety policies and manual where applicable to facilities	Compliance audits with corrective action complete within audit prescribed timeframes	
	Facilities are "Fit for intended purpose" and long term value maximized	Asset Plans consistent with PAS 55 specifications and Facility Quality Index (FQI) score (FQI is a future numeric target)	
	Miscellaneous Facility Standards (See appendix)	Compliance audits with corrective action complete within audit prescribed timeframes	

FCI Target – Critical Systems

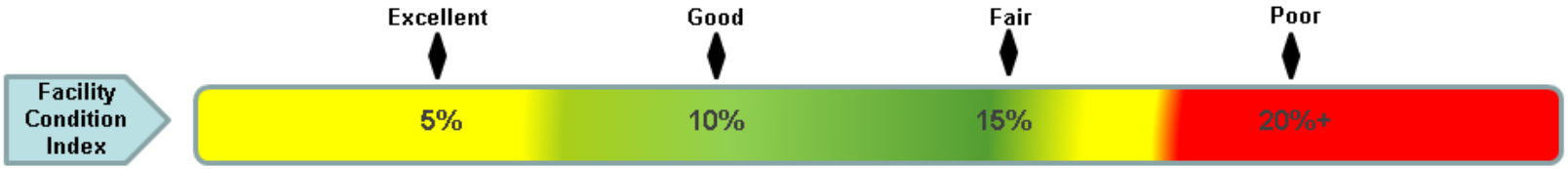


	Excellent	Excellent to Good	Good to Fair	Fair to Poor	Poor
Critical Building Systems	**Equipment operates within or near original design parameters. Has been carefully maintained to the highest standards. Minimal or no visible deterioration, wear, tear or discoloration.**	Equipment is in safe and operable condition, wear and tear consistent with age of equipment and good maintenance. Visible aesthetic deterioration. a number of deficiencies that will need to be addressed in next 5 years.	Equipment is in safe and operable condition but may not be fully efficient. Deficiencies present but not critical to operation, need to be addressed in the next 3 years.	Equipment is in safe and operable condition but not efficiently or fully effectively. Deficiencies present that are potentially critical to operation and need to be addressed in the next 1 to 2 years to maintain safe and operable conditions.	Equipment may not be fully compliant with code and needs immediate attention to maintain or restore operability

FCI Targets – Priority 1 Assets

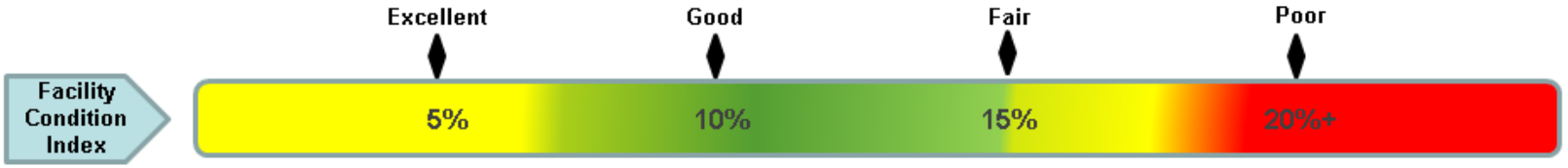
	Excellent	Excellent to Good	Good to Fair	Fair to Poor	Poor
Major Building Systems	Equipment operates within or near original design parameters. Has been carefully maintained to the highest standards. Minimal or no visible deterioration, wear, tear or discoloration.	Equipment is in safe and operable condition, wear and tear consistent with age of equipment and industry standard maintenance practices evident. Some visible deterioration but aesthetic in nature. A number of deficiencies present that will need to be addressed in next 5 years.	Equipment is in safe and operable condition but may not be fully efficient. Deficiencies present but not critical to operation but need to be addressed in the next 3 years to maintain safe and acceptable operable conditions.	Equipment is in safe but marginal operable condition may not be operating efficiently fully effectively. Deficiencies present that are potentially critical to operation and need to be addressed in the next 1 to 2 years to maintain safe and restore acceptable operable conditions.	Equipment may not be fully compliant with code and needs immediate attention to maintain or restore operability
Exterior Structure	Walls, fascia's, overhangs, doors, windows and casings in as new state of repair and free of noticeable pitting and corrosion. Roof free of corrosion or deterioration. Concrete surfaces free of cracked or damaged area's. Storm water systems functioning as intended, in excellent repair and free any obstructions or debris	Walls, fascia's, overhangs, etc in good state of repair with minor pitting, surface deterioration and corrosion, but aesthetic in nature. storm water systems functioning, in good repair and free of obstructions, A number of deficiencies present that will need to be addressed in next 5 years to maintain structure integrity and/or restore as new appearance	Walls, fascia's, overhangs, doors, windows and casings in reasonable state of repair. Noticeable pitting, surface deterioration and corrosion but primarily aesthetic in nature. Storm water systems functioning, in reasonable repair and generally free of obstructions, deficiencies present that need to be addressed in next 3 years to maintain system integrity	Walls, fascia's, overhangs, doors, etc. in a deteriorated state of repair. Substantial pitting, surface deterioration and corrosion. Storm water systems functioning but with some small restrictions, A number of deficiencies present that will need to be addressed in next 1 or 2 years to maintain structure integrity and prevent premature failure	Exterior surfaces prematurely failing, structure in need of immediate repair to prevent structure integrity failures and/or safety and/or health risks. Storm water systems not or only partially functioning, Potential candidate for demolition or replacement
Interior Structure	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling free of damage, deterioration, cracks, or defective materials and noticeable discoloration defects that would render an unsightly appearance.	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling with some noticeable deterioration, cracks, or defective materials and discoloration defects but not unsightly. A number of deficiencies may be present that need to be addressed in next 5 years to maintain structure integrity	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling with noticeable deterioration, cracks, or defective materials and discoloration defects and bordering on unsightly. A number of deficiencies present that need to be addressed in next 3 years to maintain structure integrity	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling in deteriorated state with substantial cracks, or defective materials and discoloration. Interior somewhat unsightly . A number of deficiencies present that will need to be addressed in next 1 or 2 years to maintain structure integrity.	Interior surfaces failing, structure in need of immediate repair to prevent structure integrity failures and/or safety and/or health risks.

FCI Targets – Priority 2 Assets



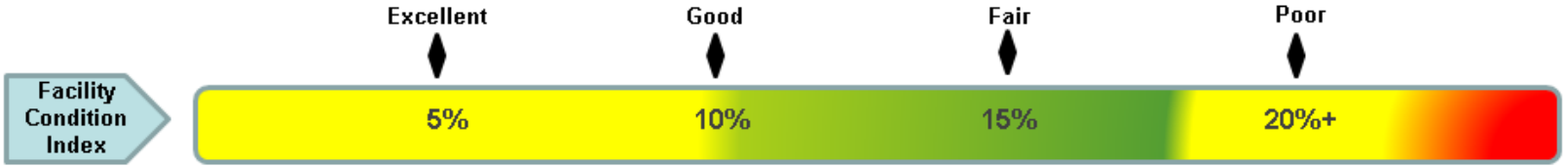
	Excellent	Excellent to Good	Good to Fair	Fair to Poor	Poor
Major Building Systems	Equipment operates within or near original design parameters. Has been carefully maintained to the highest standards. Minimal or no visible deterioration, wear, tear or discoloration.	Equipment is in safe and operable condition, wear and tear consistent with age of equipment and industry standard maintenance practices evident. Some visible deterioration but aesthetic in nature. A number of deficiencies present that will need to be addressed in next 5 years.	Equipment is in safe and operable condition but may not be fully efficient. Deficiencies present but not critical to operation but need to be addressed in the next 3 years to maintain safe and acceptable operable conditions.	Equipment is in safe but marginal operable condition may not be operating efficiently fully effectively. Deficiencies present that are potentially critical to operation and need to be addressed in the next 1 to 2 years to maintain safe and restore acceptable operable conditions.	Equipment may not be fully compliant with code and needs immediate attention to maintain or restore operability
Exterior Structure	Walls, fascia's, overhangs, doors, windows and casings in as new state of repair and free of noticeable pitting and corrosion. Roof free of corrosion or deterioration. Concrete surfaces free of cracked or damaged area's. Storm water systems functioning as intended, in excellent repair and free any obstructions or debris	Walls, fascia's, overhangs, etc in good state of repair with minor pitting, surface deterioration and corrosion, but aesthetic in nature. storm water systems functioning, in good repair and free of obstructions, A number of deficiencies present that will need to be addressed in next 5 years to maintain structure integrity and/or restore as new appearance	Walls, fascia's, overhangs, doors, windows and casings in reasonable state of repair. Noticeable pitting, surface deterioration and corrosion but primarily aesthetic in nature. Storm water systems functioning, in reasonable repair and generally free of obstructions, deficiencies present that need to be addressed in next 3 years to maintain system integrity	Walls, fascia's, overhangs, doors, etc. in a deteriorated state of repair. Substantial pitting, surface deterioration and corrosion. Storm water systems functioning but with some small restrictions, Anumber of deficiencies present that will need to be addressed in next 1 or 2 years to maintain structure integrity and prevent premature failure	Exterior surfaces prematurely failing, structure in need of immediate repair to prevent structure integrity failures and/or safety and/or health risks. Storm water systems not or only partially functioning, Potential candidate for demolition or replacement
Interior Structure	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling free of damage, deterioration, cracks, or defective materials and noticeable discoloration defects that would render an unsightly appearance.	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling with some noticeable deterioration, cracks, or defective materials and discoloration defects but not unsightly. Anumber of deficiencies may be present that need to be addressed in next 5 years to maintain structure integrity	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling with noticeable deterioration, cracks, or defective materials and discoloration defects and bordering on unsightly. A number of deficiencies present that need to be addressed in next 3 years to maintain structure integrity	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling in deteriorated state with substantial cracks, or defective materials and discoloration. Interior somewhat unsightly . A number of deficiencies present that will need to be addressed in next 1 or 2 years to maintain structure integrity.	Interior surfaces failing, structure in need of immediate repair to prevent structure integrity failures and/or safety and/or health risks.

FCI Targets – Priority 3 Assets



	Excellent	Excellent to Good	Good to Fair	Fair to Poor	Poor
Major Building Systems	Equipment operates within or near original design parameters. Has been carefully maintained to the highest standards. Minimal or no visible deterioration, wear, tear or discoloration.	Equipment is in safe and operable condition, wear and tear consistent with age of equipment and industry standard maintenance practices evident. Some visible deterioration but aesthetic in nature. A number of deficiencies present that will need to be addressed in next 5 years.	Equipment is in safe and operable condition but may not be fully efficient. Deficiencies present but not critical to operation but need to be addressed in the next 3 years to maintain safe and acceptable operable conditions.	Equipment is in safe but marginal operable condition may not be operating efficiently fully effectively. Deficiencies present that are potentially critical to operation and need to be addressed in the next 1 to 2 years to maintain safe and restore acceptable operable conditions.	Equipment may not be fully compliant with code and needs immediate attention to maintain or restore operability
Exterior Structure	Walls, fascia's, overhangs, doors, windows and casings in as new state of repair and free of noticeable pitting and corrosion. Roof free of corrosion or deterioration. Concrete surfaces free of cracked or damaged area's. Storm water systems functioning as intended, in excellent repair and free any obstructions or debris	Walls, fascia's, overhangs, etc in good state of repair with minor pitting, surface deterioration and corrosion, but aesthetic in nature. storm water systems functioning, in good repair and free of obstructions, A number of deficiencies present that will need to be addressed in next 5 years to maintain structure integrity and/or restore as new appearance	Walls, fascia's, overhangs, doors, windows and casings in reasonable state of repair. Noticeable pitting, surface deterioration and corrosion but primarily aesthetic in nature. Storm water systems functioning, in reasonable repair and generally free of obstructions, deficiencies present that need to be addressed in next 3 years to maintain system integrity	Walls, fascia's, overhangs, doors, etc. in a deteriorated state of repair. Substantial pitting, surface deterioration and corrosion. Storm water systems functioning but with some small restrictions, Anumber of deficiencies present that will need to be addressed in next 1 or 2 years to maintain structure integrity and prevent premature failure	Exterior surfaces prematurely failing, structure in need of immediate repair to prevent structure integrity failures and/or safety and/or health risks. Storm water systems not or only partially functioning, Potential candidate for demolition or replacement
Interior Structure	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling free of damage, deterioration, cracks, or defective materials and noticeable discoloration defects that would render an unsightly appearance.	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling with some noticeable deterioration, cracks, or defective materials and discoloration defects but not unsightly. Anumber of deficiencies may be present that need to be addressed in next 5 years to maintain structure integrity	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling with noticeable deterioration, cracks, or defective materials and discoloration defects and bordering on unsightly. A number of deficiencies present that need to be addressed in next 3 years to maintain structure integrity	Interior walls, doors, flooring, stairways, trim, cabinets counters and ceiling in deteriorated state with substantial cracks, or defective materials and discoloration. Interior somewhat unsightly . A number of deficiencies present that will need to be addressed in next 1 or 2 years to maintain structure integrity.	Interior surfaces failing, structure in need of immediate repair to prevent structure integrity failures and/or safety and/or health risks.

FCI Targets – Priority 4 Assets



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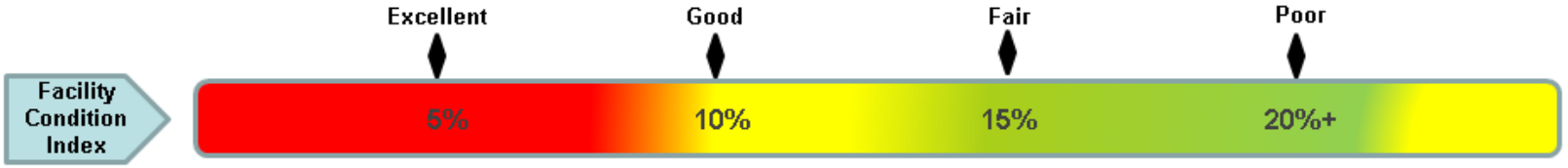
FCI Targets – Priority 5 Assets



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SPACE MANAGEMENT SERVICE STANDARDS

Facility Strategic Objective	Space Management Strategic Objective	Performance Metric	Target
1. Safeguard power system reliability 2. Safeguard health and safety of facility users 3. Productive work environment 4. Cost effective & Sustainable buildings 5. Maximize long term value 6. Optimize utilization	• Safeguard health and safety of physical environment • Positive, Productive work environment • Sustainability • Maximize long term value • Optimize space utilization	Compliance with DOE established office space average square foot allocation standard	Average 200 usable square foot per person - Portland and Vancouver
		Office space policy for workspace size and layout	Percent of workstations set to BPAM standard as part of moves
			Percent of total workstations that meet BPAM policy/standards
		Interior Gross Area per person in office space	Maintain or exceed baseline of 316 IGA per person
		Churn rate for moves	Moves as a percent of workspace occupants.
			Discretionary moves per capita
		Percent of Swing Space	Swing Space between 10% - 15% based on industry benchmark
		Level of service - Cycle time to complete day to day moves	Average of 10 days from time move date is set by space management
		Compliance with applicable office interiors codes	Safety Walk thru/reviews with corrective action complete within the prescribed timeframes
		Level of service - Customer Satisfaction with overall move process	Overall Satisfaction rate of 3.4 or higher
		Cost of Service	Average cost per move
			Average cost per workstation adjustment

SWITCHYARD DRAINAGE ISSUES

Poor pavement and drainage structures maintenance…

…can cause outfalls and ditches to fail which allows storm water to back up.

SWITCHYARD DRAINAGE ISSUES (CONT.)

Silt infiltrates switchyard rock, altering its electrical grounding properties.

Saturated soils weaken, putting structures at risk. Standing water increases hazards to electrical workers.

SWITCHYARD DRAINAGE ISSUES (CONT.)

Effects of frost heave and saturated soils

GROUNDWATER INFILTRATION ISSUES

Critical sump pumps failing, putting control house basements at risk of flooding. A majority are not alarmed.

Infiltrated water reaches high levels, creating collateral damage and safety concerns.

ROOF MAINTENANCE

Presence of leaves, moss and saturated roof areas damages roof structure.

Roof drainage structures blocked. Saturated roofing materials.

AGED FACILITIES

CODE VIOLATIONS

EROSION DAMAGE

Severe erosion damage puts BPA oil tanks, fence, wood & steel structures at risk.

Repairs almost complete

FINANCIAL DISCLOSURE

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