

HQ 10-Year Capital Plan

FY19-28 estimates as of September 2018

Lakewood, CO

October 2, 2018

Introduction

- Welcome
- Approach to plan development
 - HQ/regional collaboration
 - Capital planning committee
 - Customer feedback
- Key drivers
 - Lifecycle management - IT, Aviation
 - Physical Security
 - Improved reliability & efficiency
- Today's focus



Lifecycle Management strategy

Effective lifecycle management will:

- Increase reliability
- Enable effective financial planning
- Meet compliance requirements
 - FISMA
 - NERC - CIP
 - FITARA
 - Financial



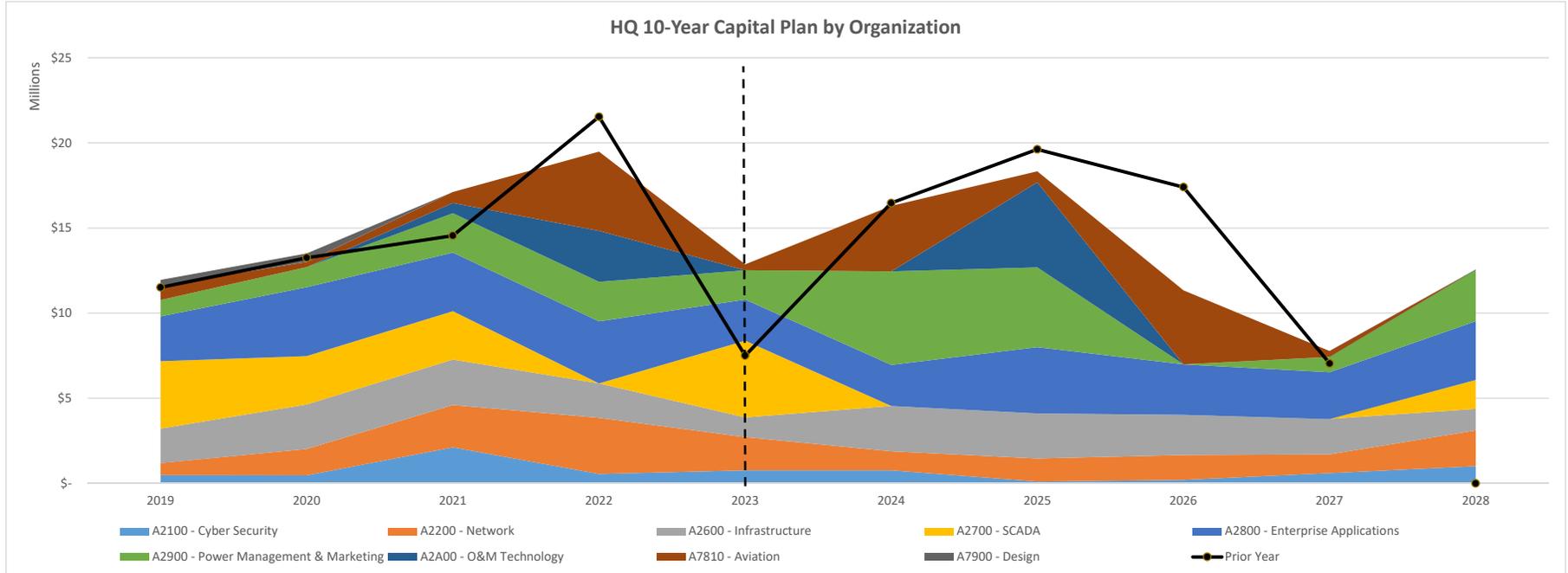
Lifecycle Management strategy (cont.)

- Planned obsolescence every 4-7 years
 - Maintain vendor support
 - Leverage supported hardware
- Continue to move technology toward these goals
- Improve cybersecurity posture
- Take advantage of newer hardware architecture and software features



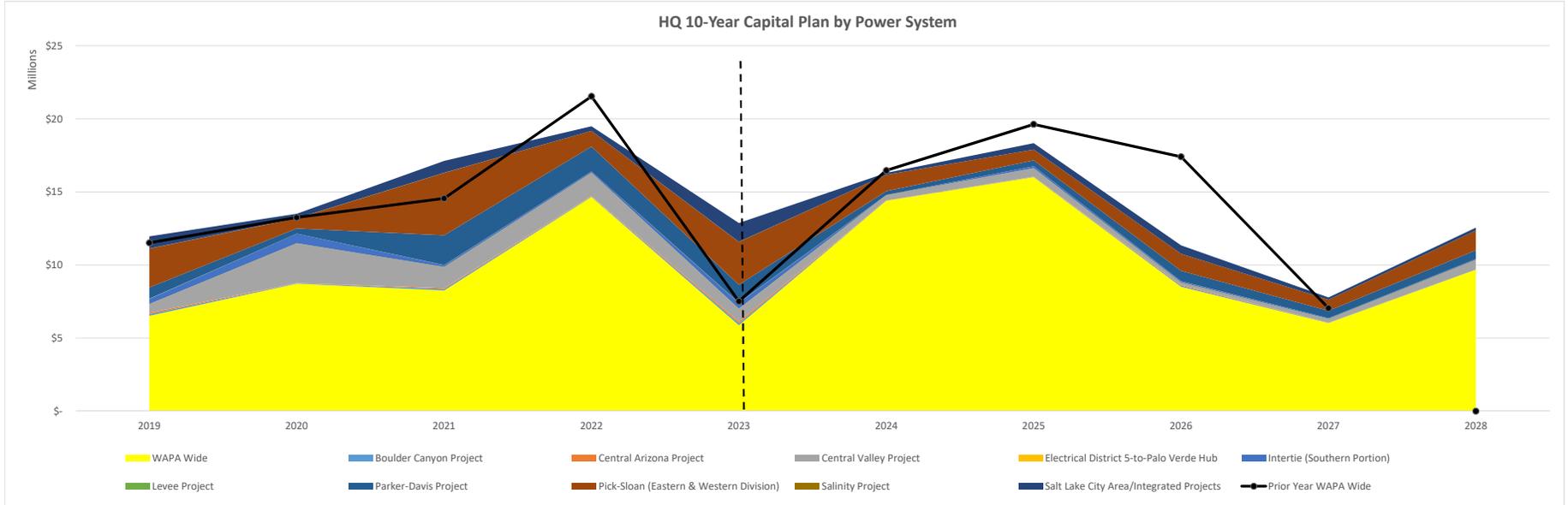
HQ 10-Year Capital Plan by Organization

Organization	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Grand Total	% of Total
A2100 - Cyber Security	483,000	479,000	2,116,400	556,000	773,000	771,000	110,000	210,000	611,000	1,014,000	7,123,400	5%
A2200 - Network	706,828	1,533,490	2,486,600	3,292,500	1,939,750	1,106,750	1,350,000	1,447,350	1,088,425	2,091,874	17,043,567	12%
A2600 - Infrastructure	2,029,000	2,619,000	2,672,200	2,021,400	1,161,500	2,669,050	2,644,500	2,370,120	2,079,000	1,264,550	21,530,320	15%
A2700 - SCADA	3,955,000	2,840,000	2,840,000		4,511,500					1,700,000	15,846,500	11%
A2800 - Enterprise Applications	2,635,000	4,050,000	3,440,000	3,650,000	2,410,000	2,410,000	3,900,000	2,960,000	2,750,000	3,450,000	31,655,000	22%
A2900 - Power Management & Marketing	963,180	1,184,000	2,318,000	2,318,000	1,724,000	5,500,000	4,684,000	0	900,000	3,035,000	22,626,180	16%
A2A00 - O&M Technology			600,000	3,000,000			5,000,000				8,600,000	6%
A7810 - Aviation	850,000	300,000	650,000	4,650,000	350,000	3,850,000	650,000	4,350,000	350,000		16,000,000	11%
A7900 - Design	335,000	500,000									835,000	1%
Grand Total	11,957,008	13,505,490	17,123,200	19,487,900	12,869,750	16,306,800	18,338,500	11,337,470	7,778,425	12,555,424	141,259,967	100%



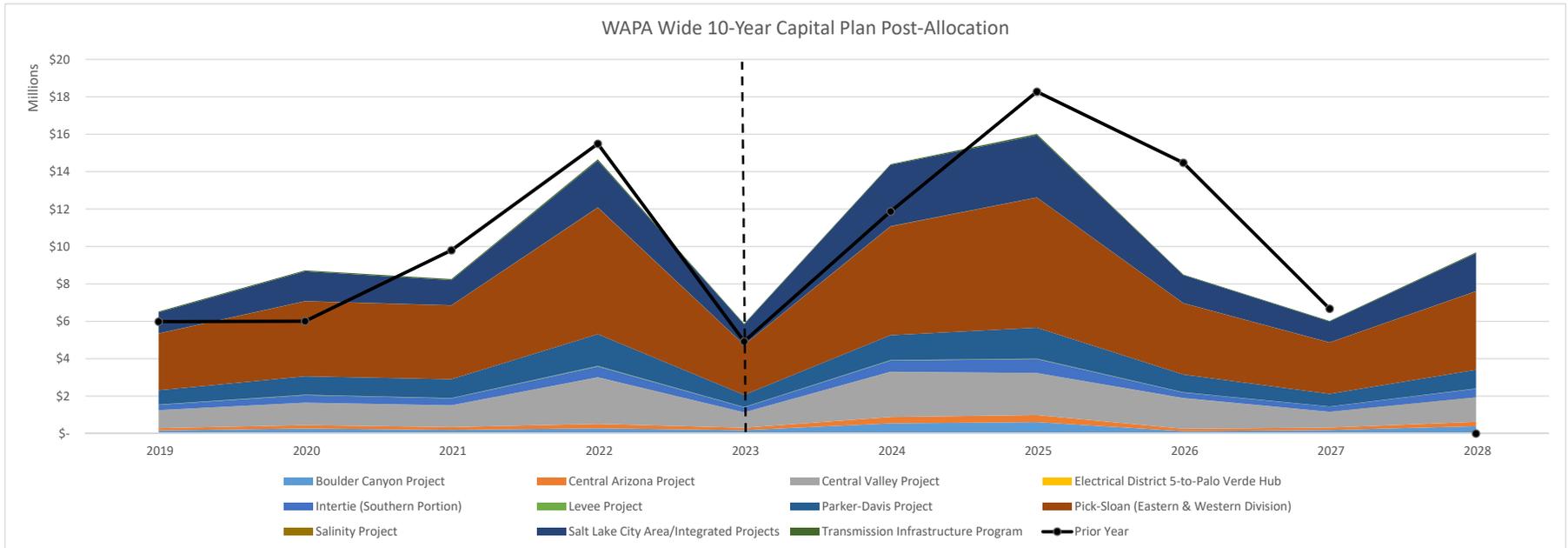
HQ 10-Year Capital Plan by Power System

Power System	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Grand Total	% of Total
Boulder Canyon Project	108,269	22,927	97,518	39,215	128,738	3,666	18,552	75,739	15,744		510,367	0%
Central Arizona Project	97,805	19,557	71,909	28,917	126,419	2,703	15,489	55,849	11,610		430,257	0%
Central Valley Project	601,160	2,722,500	1,440,880	1,596,000	881,128	374,250	573,700	162,500	257,000	671,100	9,280,218	7%
Electrical District 5-to-Palo Verde Hub	166	55	424	171	26	16	50	329	68		1,305	0%
Intertie (Southern Portion)	347,092	654,512	119,895	75,182	388,886	10,318	130,844	81,469	49,935	64,600	1,922,731	1%
Levee Project	13,541	2,596	8,395	3,376	18,479	316	2,022	6,520	1,355		56,601	0%
Parker-Davis Project	768,586	353,031	2,033,818	1,696,082	1,229,284	264,333	405,016	705,307	507,695	584,000	8,547,152	6%
Pick-Sloan (Eastern & Western Division)	2,655,735	694,250	4,275,970	1,073,900	2,923,889	1,113,393	732,200	1,165,875	747,400	1,352,800	16,735,411	12%
Salinity Project	7,094	1,385	4,749	1,910	9,461	179	1,087	3,688	767		30,318	0%
Salt Lake City Area/Integrated Projects	834,860	312,927	812,943	312,248	1,290,692	139,408	441,941	574,824	161,476	200,200	5,081,519	4%
WAPA Wide	6,522,700	8,721,750	8,256,700	14,660,900	5,872,750	14,398,220	16,017,600	8,505,370	6,025,375	9,682,724	98,664,089	70%
Grand Total	11,957,008	13,505,490	17,123,200	19,487,900	12,869,750	16,306,800	18,338,500	11,337,470	7,778,425	12,555,424	141,259,967	100%



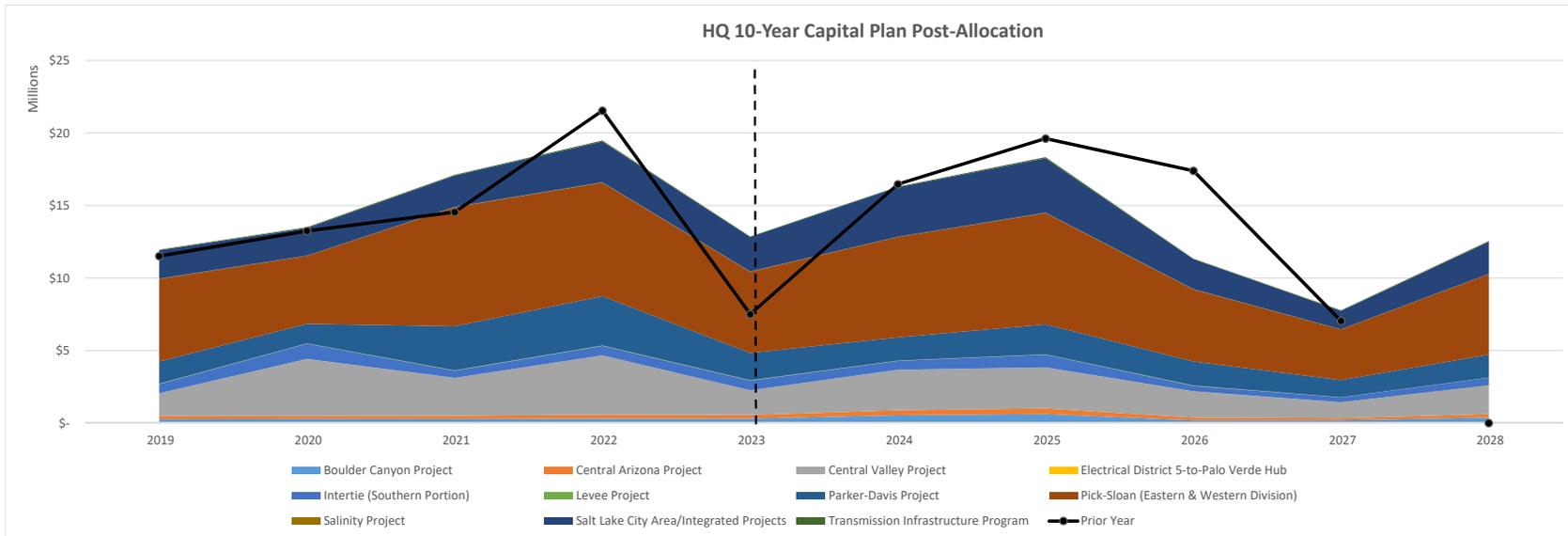
WAPA Wide 10-Year Capital Plan Post-Allocation

Power System	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Sum of Total	% of Total
Boulder Canyon Project	165,492	271,972	197,948	278,039	184,774	542,456	613,451	126,587	188,685	388,500	2,957,903	3%
Central Arizona Project	119,553	178,868	145,507	236,383	121,482	342,261	376,056	126,744	124,247	233,706	2,004,808	2%
Central Valley Project	968,580	1,203,902	1,171,818	2,490,826	828,997	2,415,252	2,246,843	1,638,868	849,248	1,314,099	15,128,433	15%
Electrical District 5-to-Palo Verde Hub	1,629	1,299	1,723	6,329	999	4,802	2,139	5,217	1,020	898	26,054	0%
Intertie (Southern Portion)	283,848	401,169	367,120	573,354	267,208	600,956	744,464	295,513	274,264	459,663	4,267,561	4%
Levee Project	13,131	15,879	17,461	31,744	10,508	19,484	23,917	18,765	10,828	13,948	175,664	0%
Parker-Davis Project	760,260	989,682	1,000,345	1,697,200	656,477	1,331,126	1,654,769	947,250	675,240	996,183	10,708,532	11%
Pick-Sloan (Eastern & Western Division)	3,037,992	4,006,863	3,945,728	6,762,171	2,671,349	5,817,313	6,953,072	3,807,670	2,745,124	4,198,268	43,945,550	45%
Salinity Project	7,428	9,040	9,916	17,752	5,970	10,817	13,601	10,367	6,153	7,962	99,007	0%
Salt Lake City Area/Integrated Projects	1,126,442	1,590,936	1,344,337	2,494,983	1,091,685	3,277,386	3,312,323	1,498,453	1,116,164	2,021,607	18,874,316	19%
Transmission Infrastructure Program	38,345	52,140	54,798	72,118	33,302	36,367	76,964	29,935	34,402	47,890	476,262	0%
Grand Total	6,522,700	8,721,750	8,256,700	14,660,900	5,872,750	14,398,220	16,017,600	8,505,370	6,025,375	9,682,724	98,664,089	100%



HQ 10-Year Capital Plan Post-Allocation

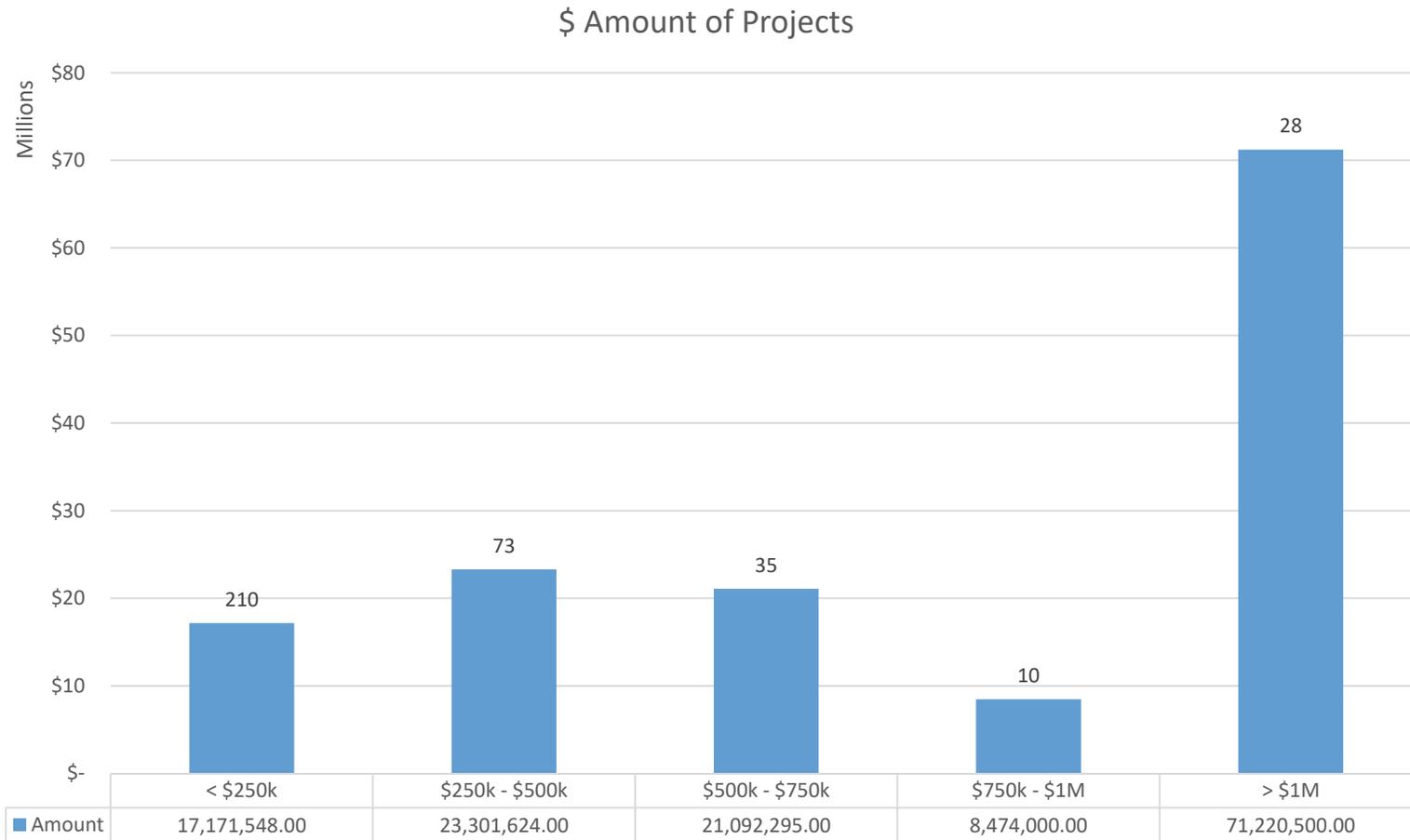
Power System	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Sum of Total	% of Total
Boulder Canyon Project	273,761	294,899	295,465	317,254	313,511	546,121	632,003	202,326	204,429	388,500	3,468,270	2%
Central Arizona Project	217,358	198,424	217,416	265,300	247,901	344,964	391,545	182,593	135,857	233,706	2,435,065	2%
Central Valley Project	1,569,740	3,926,402	2,612,698	4,086,826	1,710,125	2,789,502	2,820,543	1,801,368	1,106,248	1,985,199	24,408,651	17%
Electrical District 5-to-Palo Verde Hub	1,795	1,353	2,147	6,499	1,025	4,818	2,189	5,546	1,088	898	27,359	0%
Intertie (Southern Portion)	630,940	1,055,681	487,015	648,536	656,094	611,274	875,308	376,982	324,199	524,263	6,190,292	4%
Levee Project	26,672	18,475	25,856	35,120	28,987	19,799	25,939	25,285	12,183	13,948	232,265	0%
Parker-Davis Project	1,528,846	1,342,713	3,034,163	3,393,282	1,885,761	1,595,459	2,059,785	1,652,557	1,182,935	1,580,183	19,255,683	14%
Pick-Sloan (Eastern & Western Division)	5,693,727	4,701,113	8,221,698	7,836,071	5,595,237	6,930,706	7,685,272	4,973,545	3,492,524	5,551,068	60,680,961	43%
Salinity Project	14,522	10,425	14,664	19,662	15,431	10,996	14,688	14,056	6,920	7,962	129,324	0%
Salt Lake City Area/Integrated Projects	1,961,303	1,903,863	2,157,280	2,807,232	2,382,377	3,416,794	3,754,264	2,073,277	1,277,640	2,221,807	23,955,835	17%
Transmission Infrastructure Program	38,345	52,140	54,798	72,118	33,302	36,367	76,964	29,935	34,402	47,890	476,262	0%
Grand Total	11,957,008	13,505,490	17,123,200	19,487,900	12,869,750	16,306,800	18,338,500	11,337,470	7,778,425	12,555,424	141,259,967	100%



Changes highlighted

- Overall plan total consistent with PY plan
- Rolling 5-year rate window increase of 3%
- Network expansion in support of cloud, wifi, and remote access
- Infrastructure expansion in support of data storage growth
- Enterprise Applications mandates and initiatives
- Power Management and Marketing decreases

≥\$1M – Project-level information



**HQ 10-Year Capital Plan
Projects >\$1M**

Org Name	Project #	Name Of Project	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Grand Total	
A2800 - Enterprise Applications	#1	Enterprise Application Enhancements - 2028										2,350,000	2,350,000	
	#2	Enterprise Applications Upgrades and Enhancements - 2024						2,160,000					2,160,000	
	#3	Enterprise Applications - Hardware Lifecycle Replacement - 2027									1,600,000		1,600,000	
	#4	Enterprise Applications - Hardware Lifecycle Replacement - 2028										1,100,000	1,100,000	
	#5	Enterprise Applications - Hardware Lifecycle Replacement - 2022				1,500,000							1,500,000	
	#6	Enterprise Applications - Hardware Lifecycle Replacement - 2023					1,210,000						1,210,000	
	#7	Enterprise Applications Upgrades - 2025							2,750,000				2,750,000	
	#8	Enterprise Applications Upgrades - 2026									2,000,000		2,000,000	
	#9	FIMS 12.2 Upgrade - 2020		1,650,000										1,650,000
	#10	FIMS 12.2 Upgrade and Enhancements - 2021			1,700,000									1,700,000
A2800 - Enterprise Applications Total				1,650,000	1,700,000	1,500,000	1,210,000	2,160,000	2,750,000	2,000,000	1,600,000	3,450,000	18,020,000	
	#11	Metering Strategy - MV90 Infrastructure Enhancement						2,500,000					2,500,000	
	#12	Power Billing Software System - Phase I						3,000,000					3,000,000	
	#13	Power Billing Software System - Phase II							3,000,000				3,000,000	
	#14	Standardize EMMO and Settlements tools across WAPA Phase I			2,318,000								2,318,000	
	#15	Standardize EMMO and Settlements tools across WAPA Phase II				2,318,000							2,318,000	
	#16	Upgrade/Replace In-house developed tools - update frameworks		1,184,000										1,184,000
	#17	Upgrade/Replace In-house developed tools - update frameworks - 2025								1,184,000				1,184,000
A2900 - Power Management & Marketing Total				1,184,000	2,318,000	2,318,000		5,500,000	4,184,000			2,350,000	17,854,000	
A2700 - SCADA	#18	Common SCADA/EMS Vendor	3,955,000										3,955,000	
	#19	Implementation of the Common SCADA vendor - RMR/DSW (PD)					2,840,000						2,840,000	
	#20	Implementation of the Common SCADA vendor - SNR (PD)		2,840,000									2,840,000	
	#21	Implementation of the Common SCADA vendor - UGP (PD)			2,840,000								2,840,000	
	#22	PI enterprise license renewal - FY23					1,671,500						1,671,500	
	#23	PI enterprise license renewal - FY28										1,700,000	1,700,000	
A2700 - SCADA Total			3,955,000	2,840,000	2,840,000		4,511,500					1,700,000	15,846,500	
A7810 - Aviation	#24	2022 Aviation Helicopter replacement				4,000,000							4,000,000	
	#25	2024 Aviation Helicopter Replacement						3,500,000					3,500,000	
	#26	2026 Aviation Helicopter Replacement								4,000,000			4,000,000	
A7810 - Aviation Total						4,000,000		3,500,000		4,000,000			11,500,000	
A2A00 - O&M Technology	#27	Key Management System Concept				3,000,000							3,000,000	
	#28	Security Operations Center Concept							5,000,000				5,000,000	
A2A00 - O&M Technology Total						3,000,000			5,000,000				8,000,000	
Grand Total			3,955,000	5,674,000	6,858,000	10,818,000	5,721,500	11,160,000	11,934,000	6,000,000	1,600,000	7,500,000	71,220,500	



Enterprise Records Management

<p>What</p> <ul style="list-style-type: none"> • Install Records Management System and manage permanent records in an electronic format by December 2019 (FY18, FY19 - \$1.2M) • Manage records electronically and digitize all physical records by December 2022 (FY20- \$650k, FY21 - \$790k, FY22 - \$440k) • FY18 - FY22 - \$3M total 	<p>Why</p> <ul style="list-style-type: none"> • Meet Office of Management and Budget (OMB)/National Archives and Records Administration(NARA) directives in M-12-18 to manage permanent records electronically by 12/31/2019 • NARA will no longer accept physical records after 12/31/2022
<p>Value</p> <ul style="list-style-type: none"> • Eliminate redundant, obsolete, and trivial records • Ability to access records from a common point will result in operational efficiencies • Potential offset costs by eliminating overlapping systems 	<p>Alternatives</p> <ul style="list-style-type: none"> • Alternative 1 – Status Quo • Alternative 2 – Leverage existing solutions • Alternative 3 – Purchase Commercial-Off-The-Shelf (COTS) product <p>Planned alternative – Purchase COTS</p>

Enterprise Applications Upgrades and Enhancements (#1, #2)

<p>What</p> <ul style="list-style-type: none">• Upgrades and enhancements for mission supporting financial, budget, maintenance, asset management, travel, procurement, reporting and collaboration systems.• FY24 - \$2.2M, FY28 - \$2.4M	<p>Why</p> <ul style="list-style-type: none">• Aligns with lifecycle management strategy• Upgrades to other Enterprise Applications• Comply with legislative, regulatory and compliance requirements• Support WAPA strategic initiatives
<p>Value</p> <ul style="list-style-type: none">• Leverage agile approach to deliver value sooner• Leverage a staff augmentation approach to reduce cost of delivery	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 – Status quo• Alternative 2 – Leverage existing solutions• Alternative 3 – Buy new applications/tools• Planned alternative – Leverage existing tools

Enterprise Applications

Hardware Lifecycle Replacements (#3, #4, #5, #6)

<p>What</p> <ul style="list-style-type: none">• Replace hardware hosting ~200 databases and applications used by WAPA Operations, Marketing, Maintenance and Finance business partners• FY22 - \$1.5M, FY23 - \$1.2M• FY27 - \$1.6M, FY28 - \$1.1M	<p>Why</p> <ul style="list-style-type: none">• Maintain business continuity, availability and reliability• Maintain a good cyber security posture
<p>Value</p> <ul style="list-style-type: none">• Stay within warranty period and vendor support• Maintain performance of hosted systems• Maintain availability of hosted systems	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 - Status quo• Alternative 2 - Replace• Alternative 3 - Cloud• Planned alternative – Replace

Enterprise Applications

FIMS Upgrades(#7, #8, #9, #10)

<p>What</p> <ul style="list-style-type: none"> • Financial Information Management System (FIMS) Upgrades • FY20 - \$1.7M; FY21 - \$1.7M • FY25 - \$2.8M; FY26 - \$2M 	<p>Why</p> <ul style="list-style-type: none"> • Current version de-supported 12/2021 • 2025/2026 planning for future upgrades • Maintain vendor support for updates, maintenance and patches • Aligns with lifecycle management strategy
<p>Value</p> <ul style="list-style-type: none"> • Leverage new features to comply with legislative, regulatory and compliance requirements • Vendor provides application and system security patches 	<p>Alternatives</p> <ul style="list-style-type: none"> • Alternative 1 – Status quo • Alternative 2 – Upgrade: staff augmentation • Alternative 3 – Upgrade: system integrator • Alternative 4 – Implement new system • Planned alternative – Upgrade: staff augmentation

Metering Strategy

MV90 Infrastructure Enhancement (#11)

<p>What</p> <ul style="list-style-type: none">• Critical revenue metering system(s)• FY24 - \$2.5M	<p>Why</p> <ul style="list-style-type: none">• Each WAPA region currently has standalone implementations• Status quo is resource intensive• Single metering strategy is sustainable and supportable into the future
<p>Value</p> <ul style="list-style-type: none">• Improved efficiency in metering, energy accounting and billing• Revenue reporting and data integration is maintainable and simplified• Enhanced revenue tracking	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 – Status quo• Alternative 2 – Write in-house metering system• Alternative 3 – Assemble a team to develop the strategy • Planned alternative – Assemble team

Power Billing Software System Phase I&II (#12, #13)

<p>What</p> <ul style="list-style-type: none">• Upgrade/replace in-house developed power billing system• FY24 - \$3M, FY25 - \$3M	<p>Why</p> <ul style="list-style-type: none">• In-house power billing system will be 15 years old• Frameworks will need to be upgraded to align with effective life-cycle management• Adheres to WAPA cyber security policies
<p>Value</p> <ul style="list-style-type: none">• Facilitates common practices across WAPA• Provides opportunity for efficient resource deployment• Creates common, sustainable, access to data	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 – Status quo• Alternative 2 – Re-write in-house system• Alternative 3 - Look for existing COTS system (updated cost estimate) • Planned alternative – COTS

Settlements\EMMO Tools Phase I/II (#14, #15)

<p>What</p> <ul style="list-style-type: none">• Standardize multiple systems used by WAPA Power Marketing and scheduling staff• FY21 - \$2.3M, FY22 - \$2.3M	<p>Why</p> <ul style="list-style-type: none">• Aligns with the Organizational Approach to Markets• Approximately 45 separate tools currently used within WAPA• Changing industry environment – existing tools likely won't meet needs into the future
<p>Value</p> <ul style="list-style-type: none">• Positions WAPA to better take advantage of any market participation benefits• Provides opportunity for efficient resource deployment	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 – Status quo• Alternative 2 – Build new systems in-house• Alternative 3 – Standardize existing COTS systems across WAPA <p>Planned alternative – Standardize COTS</p>

Upgrade/replace In-house developed tools (#16, #17)

<p>What</p> <ul style="list-style-type: none">• In-house developed tools for WAPA specific processes• Software lifecycle replacement of in-house power marketing related applications• FY20 - \$1.2M, FY25 - \$1.2M	<p>Why</p> <ul style="list-style-type: none">• Address WAPA specific business process needs• No vendor options at the time in-house systems were built• Unsupported by vendor
<p>Value</p> <ul style="list-style-type: none">• Facilitates exchange of information with business partners and customers• Fill the WAPA process gaps• Streamline solution to common issues	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 – Status quo• Alternative 2 – Upgrade/replace• Alternative 3 – Look for existing COTS system <p>• Planned alternative – Upgrade/replace</p>

Common SCADA/EMS Vendor (#18, #19, #20, #21)

<p>What</p> <ul style="list-style-type: none"> • Procure and install a common SCADA/EMS system across WAPA's six control centers. • FY19 – Evaluate/Analyze/Decide/Purchase (\$3.9M) • FY20 – Implement in SNR (\$2.84M) • FY21 – Implement in UGP (\$2.84M) • FY23 – Implement in DSW/RMR (\$2.84M) 	<p>Why</p> <ul style="list-style-type: none"> • System upgrades and lifecycle replacements are coming. This is an opportunity to take a fresh look at a WAPA-wide approach. • The common vendor approach has the potential to reduce costs associated with procurement, annual licensing, vendor support, internal support and training.
<p>Value</p> <ul style="list-style-type: none"> • Achieve best prices for purchase and maintenance of SCADA/EMS systems. • Improved ability to share expertise across all regions resulting in increased reliability. • Set the stage for consistency in market implementation and future operational reliability standard changes. 	<p>Alternatives</p> <ul style="list-style-type: none"> • Alternative 1 – Maintain the status quo • Alternative 2 – Keep RMR/DSW system • Alternative 3 – Keep SNR system • Alternative 4 – Keep UGP system • Alternative 5 – Replace all six systems • Planned alternative – TBD in FY19

Historian Software License Renewal (#22, #23)

What <ul style="list-style-type: none">• Historian software provides a repository for the collection of bulk electric system data.• The historian is bundled with analytical tools and display tools.• The license renewal takes place every five years.• FY23 - \$1.6M, FY28 - \$1.7M	Why <ul style="list-style-type: none">• This enterprise agreement provides WAPA with unlimited use of the historian for data collected from DSW, RMR and SNR substations. It is used by:<ul style="list-style-type: none">• Operations• Maintenance• Power Marketing
Value <ul style="list-style-type: none">• Data produced by intelligent electronic devices is growing by leaps and bounds. It takes a product like a data historian to collect, analyze and display the data.• It is used by Operations to monitor the electric system, by Maintenance for asset management, by Transmission Planning to design the grid, and by Power Marketing to observe power plants.	Alternatives <ul style="list-style-type: none">• Alternative 1 – Historian• Alternative 2 – No Historian• Planned alternative – Historian

Aviation

Helicopter Lifecycle Replacements (#24, #25, #26)

<p>What</p> <ul style="list-style-type: none">• Helicopter lifecycle replacements:• FY22 – \$4M (N619DE)• FY24 – \$3.5M (N617DE)• FY26 – \$4M (N618DE)• \$3.5M – \$4M for new, similarly-equipped to current helicopters	<p>Why</p> <ul style="list-style-type: none">• Lifecycle replacements due to either age/number of hours on airframe.• Increased operational costs of maintaining older aircraft• Existing helicopters made in '00/'07/'08• In accordance with FAA and DOE-OAM recommendations
<p>Value</p> <ul style="list-style-type: none">• Difficult to find used helicopters in quality condition• Will continue to look for opportunities similar to FY18 scenario for replacements• New helicopters come with a 2-year warranty – reduced operational costs	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 – Replace w/new helicopters• Alternative 2 – Replace w/quality used helicopters (if available)• Alternative 3 – Utilize contract helicopters• Alternative 4 – Do all line work and patrols from the ground <p>Planned alternative – Replace with new helicopters (used if available)</p>

Access Management System (concept)

(#27)

<p>What</p> <ul style="list-style-type: none">• Improves control of substation keys and access management• System will assist with compliance of CIP 003.-6 and address IG finding.• Extends our physical access control systems where feasible• FY22 - \$3M/Requirements based solution	<p>Why</p> <ul style="list-style-type: none">• Inspector General identified shortcomings in CIP –003-6• Supports CIP 003-6 requirements• Enhanced tracking, control and accountability would increase key management system effectiveness
<p>Value</p> <ul style="list-style-type: none">• Improves security• Ensures compliance• Potential decrease in effort to administer key management system process	<p>Alternatives</p> <ul style="list-style-type: none">• Alternative 1 - Extend our Physical Access Control Systems• Alternative 2 - Re-core existing locks and track the key through a combination of manual process and technology solutions to include PACs <p>Planned alternative – Alternative 2</p>

Security Operations Center (concept)

(#28)

What <ul style="list-style-type: none">• Centralize and standardize security, emergency management, cyber operations• Includes monitoring of access controls, cameras and alarms; centralized dispatch• Standardize security incident response and reporting• FY25 - \$5M/Requirements based	Why <ul style="list-style-type: none">• We are limited to regional visibility• Efficiency gained through consolidated and standardized operations• Enterprise view of WAPA emergency processes; we can convey useful information and decision support quicker...GIS
Value <ul style="list-style-type: none">• Improved security and compliance• Increases C3I across WAPA (better speed, integration, response)• Increases ability to share information with neighboring utilities and outside agencies	Alternatives <ul style="list-style-type: none">• Alternative 1 - Rely on current regional security monitoring and response capability• Alternative 2 - Provision an integrated SOC /EOC to collect information and respond to natural and physical threats• Alternative 3 - Explore integration options with other federal agencies such as DHS Planned alternative – Alternative 2

Questions and next steps

Provide feedback to Colin Marquez at
cmarquez@wapa.gov or 720.962.7434

By Oct. 19

Round table discussions

- To promote further discussion and understanding of programs, we encourage you to ask questions and have meaningful discussion.
- Power management and marketing – Led by Brett Fisher, VP of IT Power Management and Marketing and Jack Murray, VP of Power Marketing
- SCADA – Led by James Phillips, VP of IT SCADA and Jonathan Aust, Operations Manager
- Lifecycle management – Led by Joe Fast, Acting VP of IT Enterprise Applications



Glossary

Term	Description
BES	the Bulk Electric System is defined as all transmission elements operated at 100 kV or higher and real power and reactive power resources connected at 100 kV or higher. This does not include facilities used in the local distribution of electric energy.
CIP	the North American Electric Reliability Corporation (NERC) developed the Critical Infrastructure Protection (CIP) reliability standards to protect against utility cyberattacks. The standards provide a framework for protecting the reliability of the North American utility industry's bulk electric system by identifying and protecting critical cyber assets that could affect utility operations. The NERC CIP standards were approved by the Federal Energy Regulatory Commission in early 2008, making compliance with the standards mandatory and enforceable by law.
COTS	Commercial off the Shelf is an adjective that describes software or hardware products that are ready-made and available for sale to the general public. For example, Microsoft Office is a COTS product that is a packaged software solution for businesses.
EMS	an Energy Management System is a system of computer-aided tools used by operators of electric utility grids to monitor, control and optimize the performance of the generation and/or transmission system. An EMS also provides situational awareness of the bulk electric system through the use of advanced applications, such as power system state estimator and real-time contingency analysis.
Enterprise Applications	enterprise application software performs business functions such as order processing, procurement, production scheduling, customer information management, energy management, and accounting. It is typically hosted on servers and provides simultaneous services to a large number of users, typically over a computer network. This is in contrast to a single-user application that is executed on a user's personal computer and serves only one user at a time.
EMMO	Energy Management and Marketing Office- We sell power on a project-specific basis in 10 rate-setting systems. We develop marketing plans for each power system to ensure power is allocated appropriately. These plans identify customers, the amount of power available under contract, how to apply for an allocation and what WAPA will do, or not do, if there is not enough power to meet our contractual obligations.
FITARA	the Federal Information Technology Acquisition Reform Act made changes to the ways the U.S. federal government buys and manages computer technology. It became law as a part of the National Defense Authorization Act for Fiscal Year 2015. FITARA outlines specific requirements related to <ul style="list-style-type: none"> • Agency Chief Information Officer (CIO) authority enhancements • Enhanced transparency and improved risk management in IT investments • Portfolio review • Federal data center consolidation initiative • Expansion of training and use of IT cadres • Maximizing the benefit of the federal strategic sourcing initiative • Government wide software purchasing program
Lifecycle Management	lifecycle management is a process for administering system software, hardware, and support over the life of a system.
NERC	the North American Electric Reliability Corporation (NERC) is a not-for-profit international regulatory authority whose mission is to ensure the reliability of the bulk power system (BPS) in North America. NERC develops and enforces reliability standards; annually assesses seasonal and long-term reliability; monitors the BPS through system awareness; and educates, trains and certifies industry personnel.
Network	a system of computers that are joined together so that they can communicate by exchanging information and sharing resources.
OCIO	the Office of the Chief Information Officer partners effectively with every area of WAPA to develop high quality, cost-effective services that enable WAPA to execute its strategy and create business value for its customers. The information technology team provides WAPA with the technical expertise to innovate securely to meet the changing landscape in the electric industry.
Operations & Maintenance	operations and maintenance technologies are software tools used to reliably operate and maintain power systems. The tools include physical security and end user as well as operational technology such as sensors and communications devices in substations.
SCADA	Supervisory Control and Data Acquisition is a system of software and hardware elements used primarily by operations staff to control and monitor the bulk electric system and record system events for historical analysis.
WAPA	Western Area Power Administration
PD	Program Direction provides compensation and all related expenses for its workforce.
Non-PD	Non-Program Direction provides for costs not included in Program Direction.
FY	Fiscal Year

