
BUILDER in the 'Real World'

Metropolitan Washington
Airports Authority (MWAA)
Enterprise Asset Management
(EAM) Program Review

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BUILDER in the “Real World” – MWAA Enterprise Asset Management (EAM) Program Review

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AGENDA

- Why Enterprise Asset Management?
- Why BUILDER?
- Assessment Overview & Findings
- Cost Considerations & Prioritization
- Project Packaging
- How FCA Informs EAM
- Next Steps
- Open Discussion



Why Enterprise Asset Management?

- MWAA adopted an Asset Management Policy in 2018 that implemented Enterprise Asset Management (EAM)

“[The] policy directs and coordinates EAM activities across the Airports Authority in order to optimally and sustainably manage infrastructure assets for the purpose of achieving organizational goals, while efficiently utilizing limited resources.”

- EAM Policy Goals:
 - Extend the useful life of assets
 - Efficiently utilize [limited] resources
 - Optimize maintenance and replacement decisions
 - Develop accurate long-term funding strategies
 - Sustain long-term performance at the lowest cost





Why Enterprise Asset Management?

- EAM provides strategic framework to guide future investments that support:
 - Revenue growth
 - Fiscal responsibility
 - Changing customer needs
 - Organizational objectives
- Protecting that investment requires smart management
 - Accurate asset inventory
 - Probability of asset failure (condition rating)
 - Strategic replacement strategy
 - Risk management
 - Capital planning

Supported by **BUILDER SMS**



Why BUILDER to Support EAM?

- BUILDER is MWAA's adopted Condition Management & Forecasting system
- Provides objective Condition Index (0–100) and repeatable inspection standards
- Enables degradation modeling and long-term forecasting
- Integrates cost data (RSMeans) for planning estimates
- Accommodates aviation-specific assets, including PBBs, conveyances, baggage systems, AeroTrain components





Implementation Challenges (and What We're Doing About Them)

- Integration of BUILDER, Maximo, and GIS requires data governance and shared identifiers
- Parallel implementations increased change-management load
- Early assessment standards evolved; 2023 MWAA Inventory & Assessment Guide now standardizes process
- Narrative FCA reporting increased effort and cycle time
- PM turnover slowed strategic progression and organizational buy-in



MWAA Assessed to Date Overview



29 buildings assessed
5.8M sq ft assessed

14,429 total components

Total Replacement Value (CRV) **\$2,061,313,597**

Near Failure (CI 85-56)

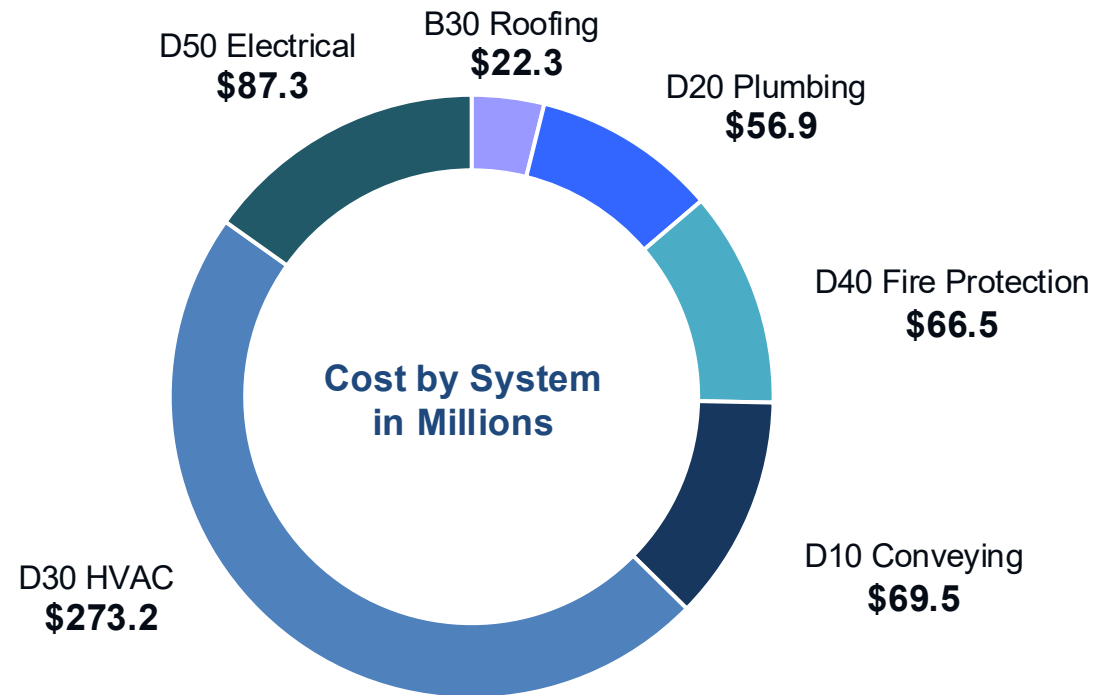
6,137 components
\$682.9M replacement value

At Failure (CI 55-0)

3,845 components
\$349.9M replacement value

*Cost amounts are estimated base costs and include limited soft cost markups

System CRV of Major Passenger Impact Near & At Failure





MWAA Program 10-Year Findings

- **Overall Assessments to Date at DCA & IAD**
 - DCA: Terminal 2, Various Hangars, Central Utility Plant (1.9M SF)
 - IAD: Main Terminal & Z gates, “Mobile Lounge” docks, Concourses A/B/C/D, Various FBO Hangars & Ops Support Facilities (3.9M SF)

Total “Final 8” Work Items


\$605M

Top 5 Work Item Cost by System

 HVAC
\$275M

 Fire Protection
\$80M

 Electrical
\$47M

 Conveying
\$45M

 Exterior
\$39M

*Replacement Costs are reflective of the costs at the time of reporting



IAD Assessed to Date Overview



22 buildings assessed
3.9M sq ft assessed

9,895 total components

Total Replacement Value (CRV) **\$1,235,526,333**

Near Failure (CI 85-56)

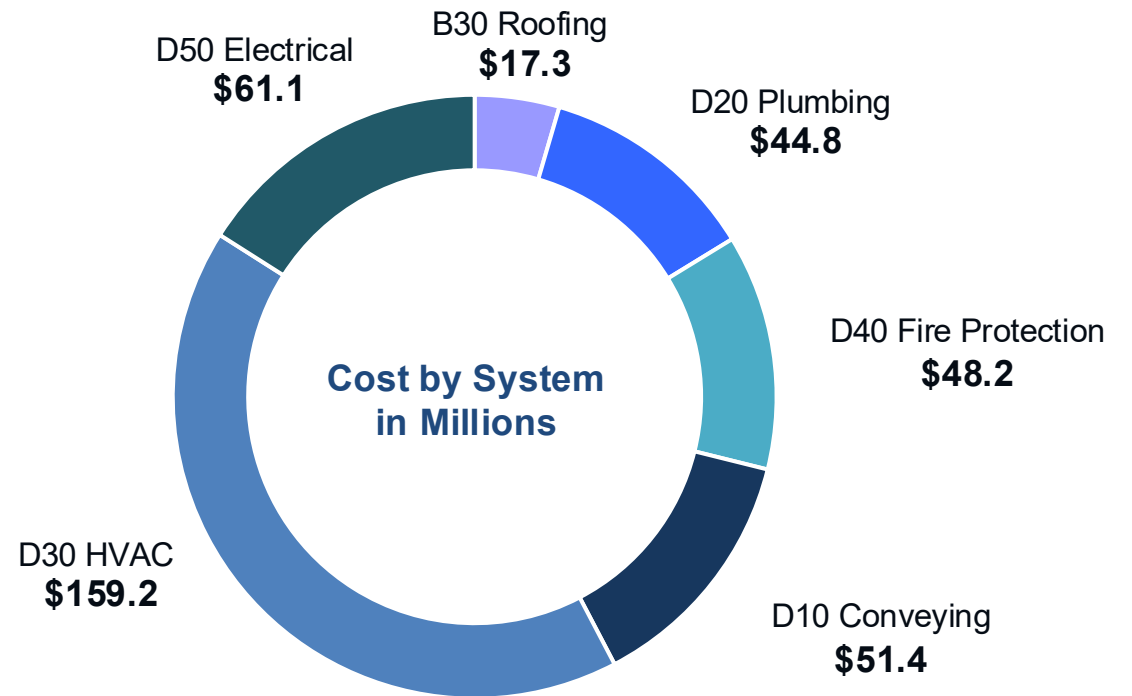
4,676 components
\$503.8M replacement value

At Failure (CI 55-0)

2,625 components
\$222.6M replacement value

*Cost amounts are estimated base costs and include limited soft cost markups

System CRV of Major Passenger Impact Near & At Failure





IAD Assessment 10-Year Findings

- **Overall Assessments to Date at IAD (3.9M SF)**
 - Main Terminal, Concourses A/B/C/D/Z, Old Air Traffic Control Tower, Various Hangars & Support Facilities


Total “Final 8” Work Items

\$422M


Top 5 Work Item Cost by System

 HVAC
\$178M

 Fire Protection
\$65M

 Electrical
\$30M

 Exterior
\$28M

 Plumbing
\$26M

*Replacement Costs are reflective of the costs at the time of reporting

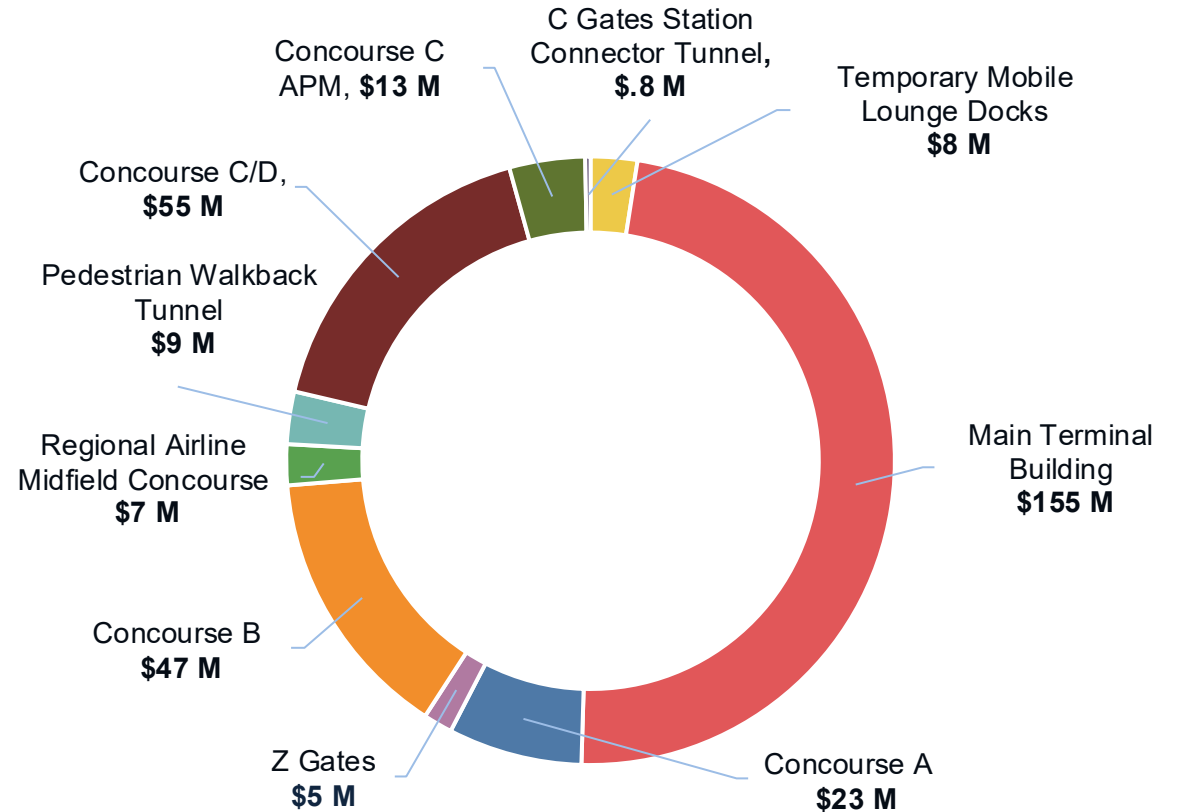


IAD Critical Findings – Passenger Facing

BCI Scores

Building Name	BCI
Concourse C/D	70
Temporary Mobile Lounge Docks	70
Main Terminal Building	75
Pedestrian Walkback Tunnel	77
Z Gates	78
Concourse A	79
Regional Airline Midfield Concourse	80
Concourse B	81
Concourse C APM Station	82
C Gates Station Connector Tunnel	90

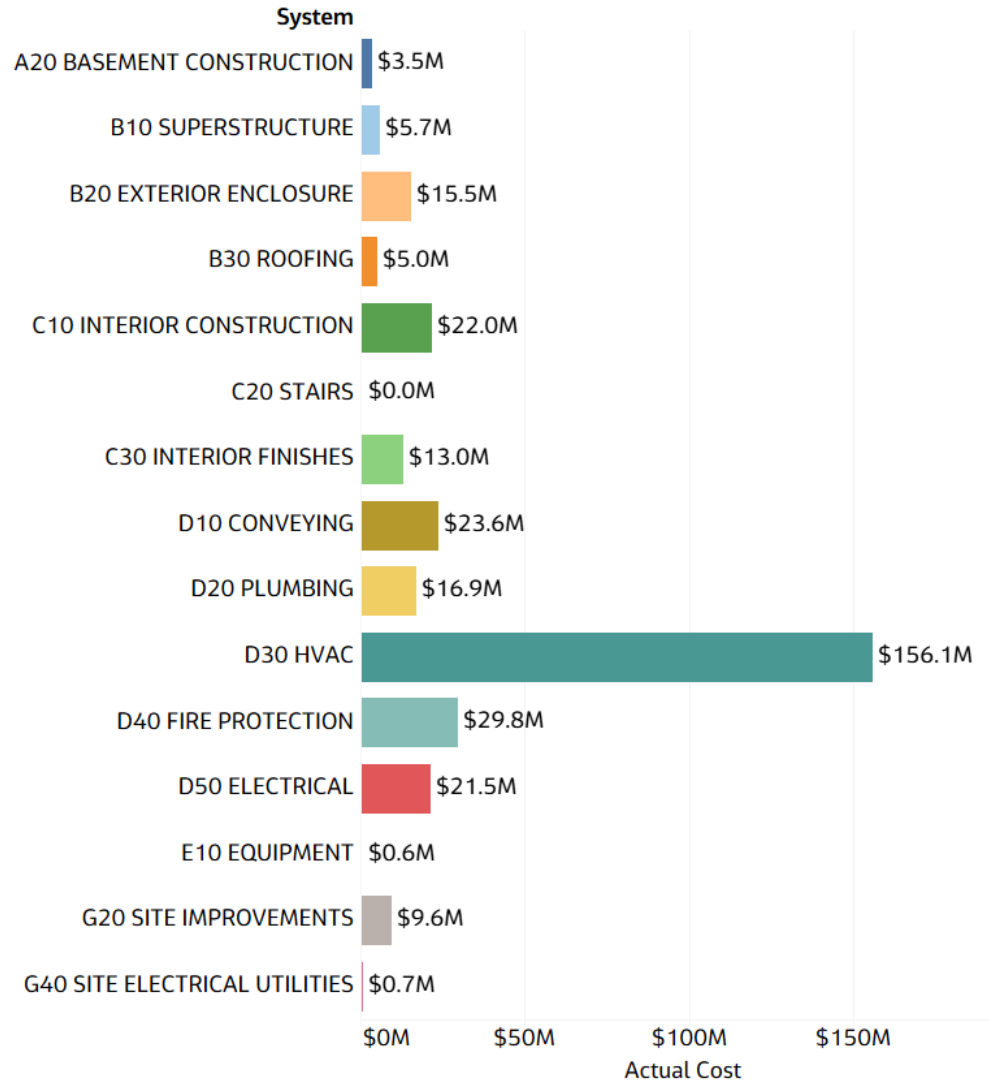
Total Work Item Cost Per Building



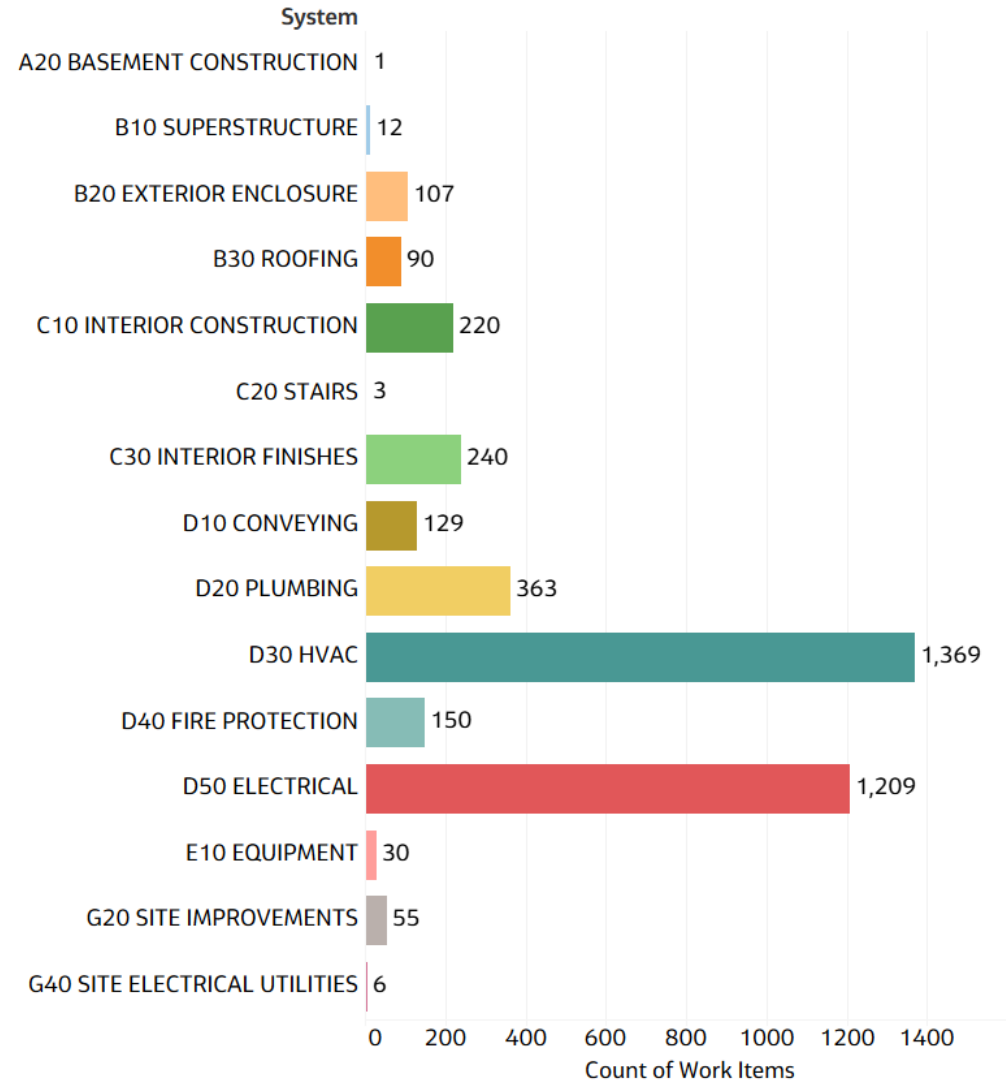


Status of IAD Passenger Facing Facilities

Total Work Item Cost by System in Passenger Facing Facilities



Number of Work Items by System in Passenger Facing Facilities





DCA Assessed to Date Overview



7 buildings assessed
1.9M sq ft assessed

4,534 total components

Total Replacement Value (CRV) **\$825,787,264**

Near Failure (CI 85-56)

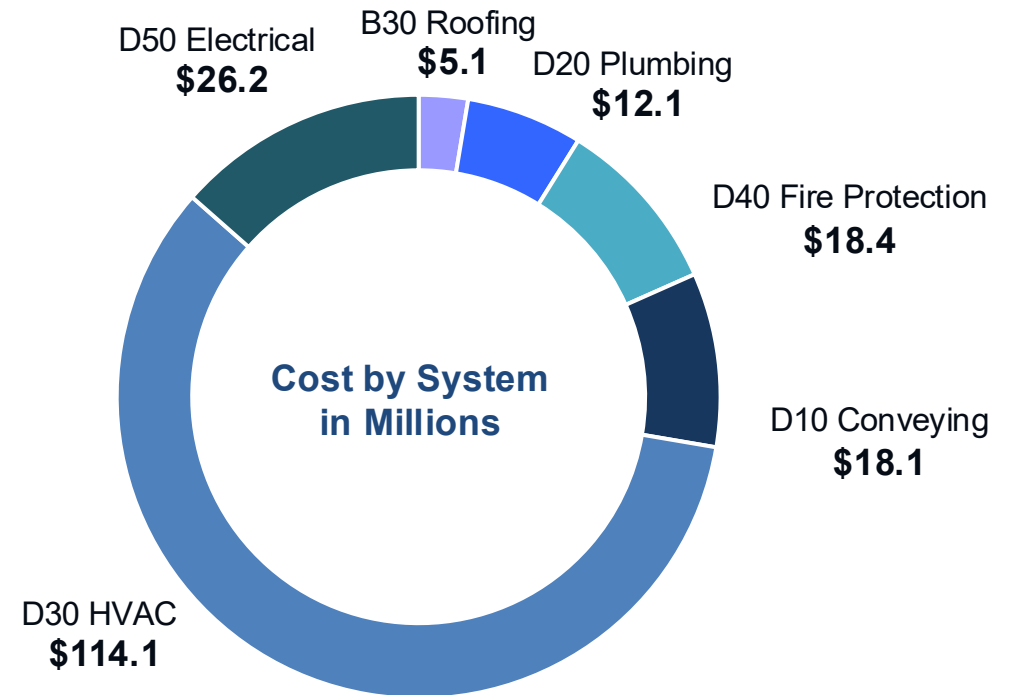
6,137 components
\$179.1M replacement value

At Failure (CI 55-0)

1,220 components
\$127.3M replacement value

*Cost amounts are estimated base costs and include limited soft cost markups

System CRV of Major Passenger Impact Near & At Failure





DCA Assessment 10-Year Findings

- **Overall Assessments to Date at DCA (1.9M SF)**
 - Terminal 2, Central Utility Plant & Various Hangars
 - Does not include Terminal 1 assessed by others


Total “Final 8” Work Items

\$183M

Top 5 Work Item Cost by System

 HVAC
\$97M

 Conveying
\$20M

 Electrical
\$17M

 Fire Protection
\$15M

 Exterior
\$11M

*Replacement Costs are reflective of the costs at the time of reporting

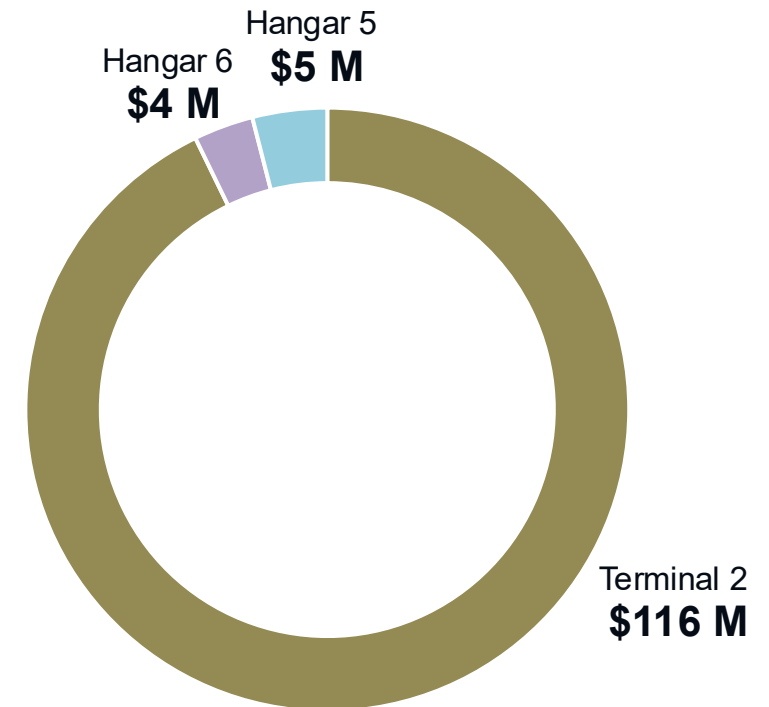


DCA Critical Findings – Passenger Facing

BCI Scores

Building Name	BCI
Hangar 6	55
Hangar 5	58
Terminal 2	83

Total Work Item Cost Per Building

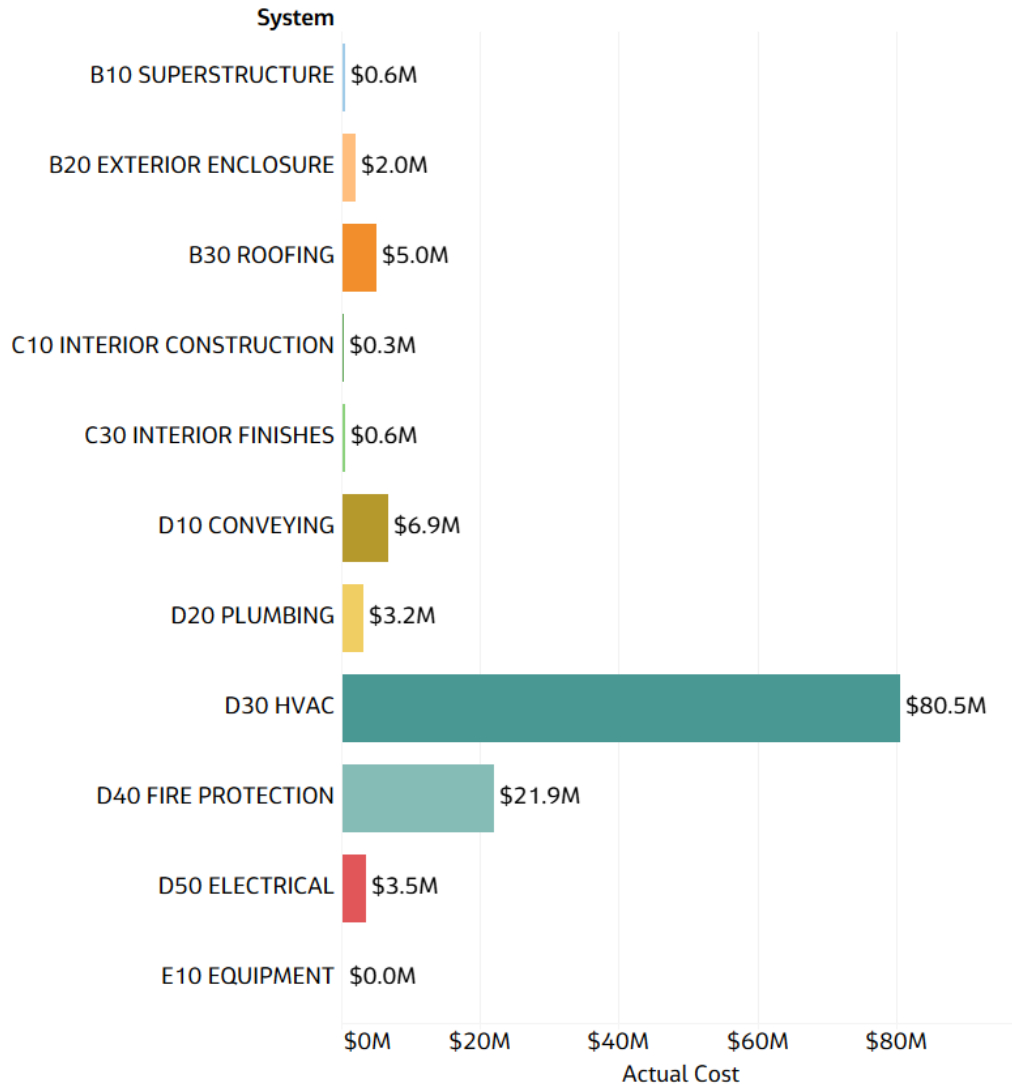


*Cost amounts are estimated base costs only and do not include soft cost markups

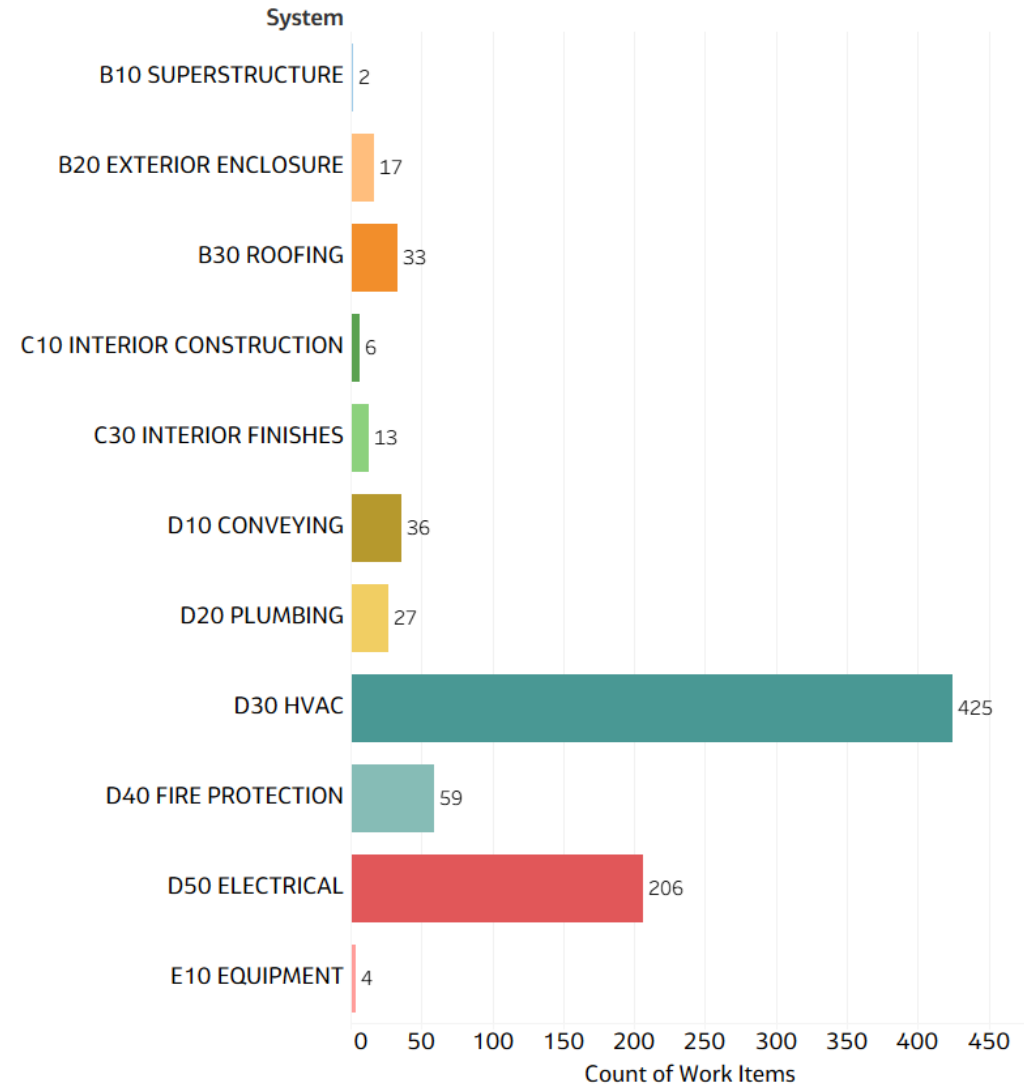


Status of DCA Passenger Facing Facilities

Total Work Item Cost by System in Passenger Facing Facilities

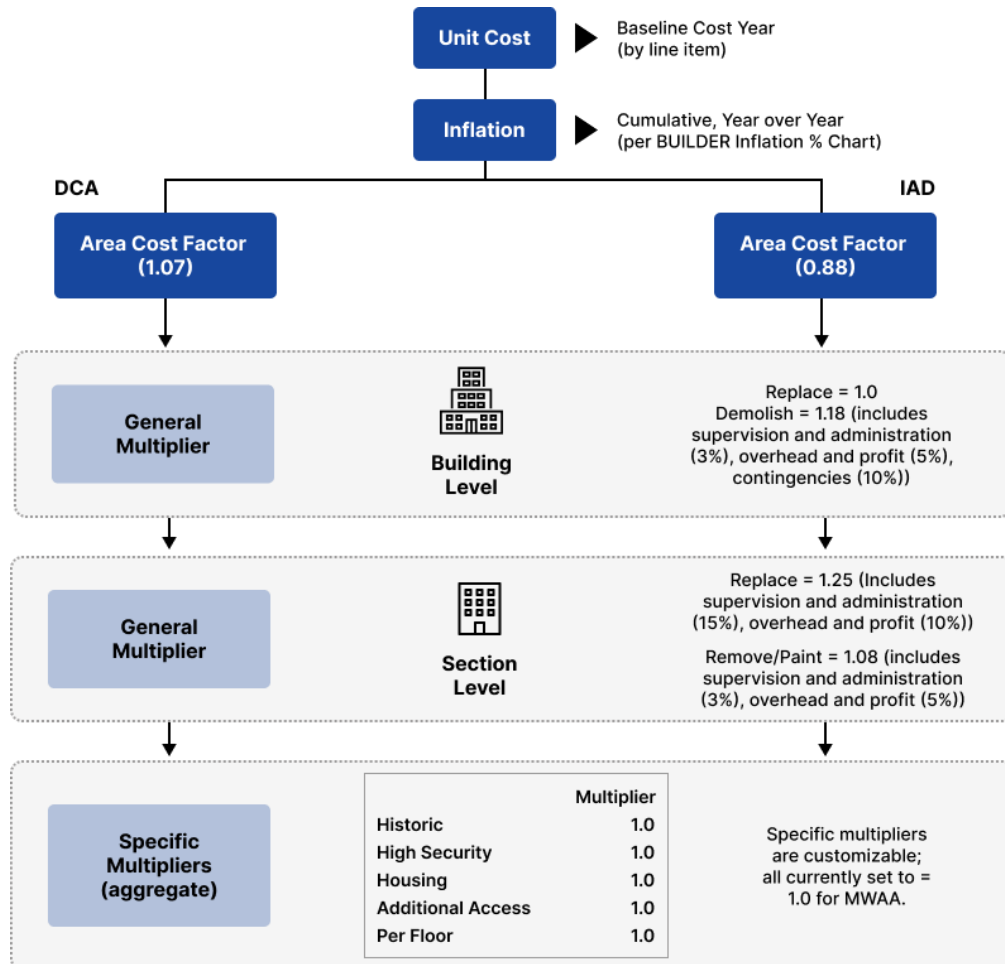


Number of Work Items by System in Passenger Facing Facilities





Work Item Cost Buildup



Work Item Total Cost =
 (Quantity) x (Unit Cost) x (Area Cost Factor)
 x (General Multiplier) x (Aggregate Specific Multiplier) x (Inflation Factor)

2025 IAD Area Cost Factor – .88
 General Multiplier – 1.25
 BUILDER Inflation Factor – 1.021
 "MWAA Factor" – 2.69

“MWAA Factor” is added to cost buildup to account for MWAA-specific circumstances seen during construction (special security & safety requirements, etc.)



Prioritization Criteria

- **Current Prioritization Criteria**

- System and Condition Index

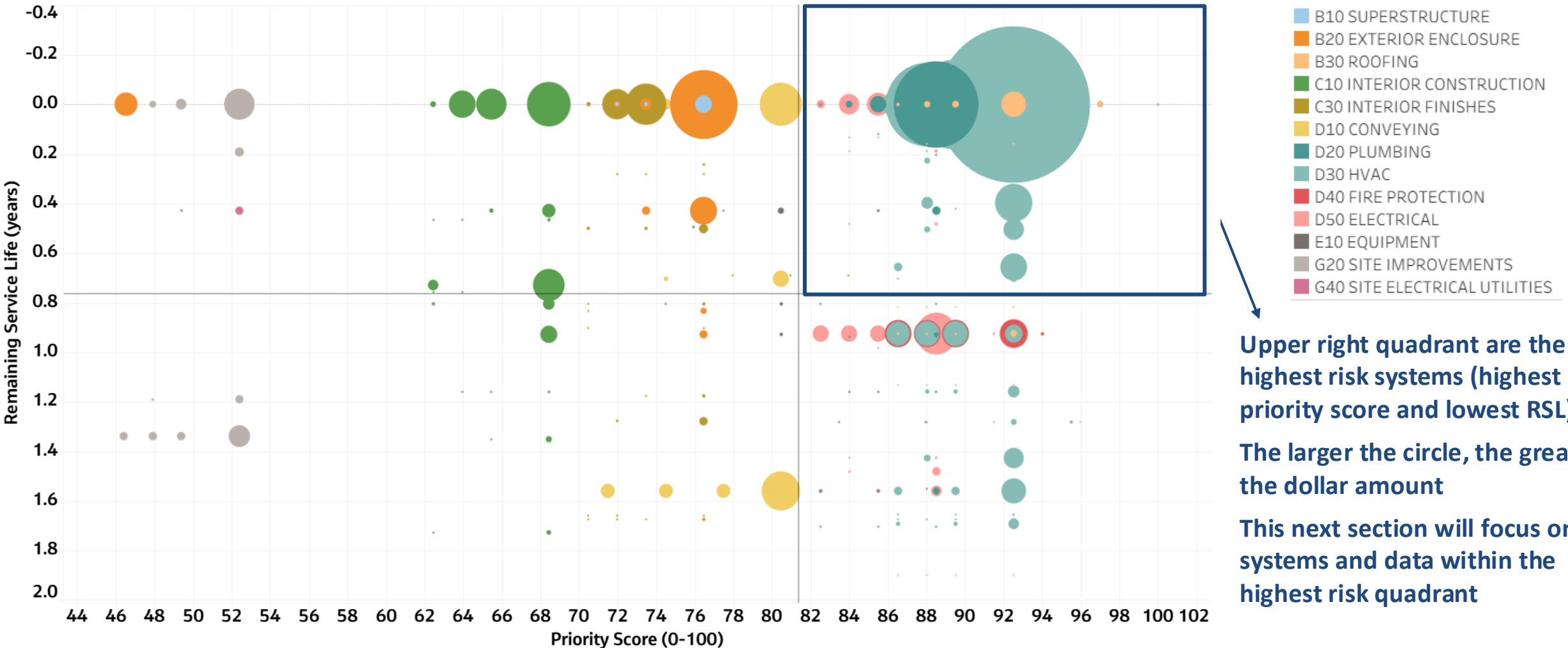
1. Systems are rated as follows, with the highest priority score being 100
 - i. 100 points (life safety related): Fire Protection, HVAC, Roofing
 - ii. 90 points: Electrical, Plumbing
 - iii. 70 points: Conveyance
 - iv. <60 points: Non-Priority Systems
2. The lower the condition index of an asset, the higher the priority
3. BUILDER blends the System and Condition Index to get the prioritization score

- Facility Tier Assignments

1. Prioritization is further defined at the Facility Level based on a Tiered approach
 - i. Tier I – Mission Critical – Failure would directly disrupt operations or compromise safety
 - ii. Tier II – High Visibility – Supports operations or passenger experience, but limited downtime is manageable without immediate mission failure
 - iii. Tier III – Support – Low passenger exposure and higher tolerance for deferred work

IAD Systems w/ Highest Impact & Risk (<2 yrs)

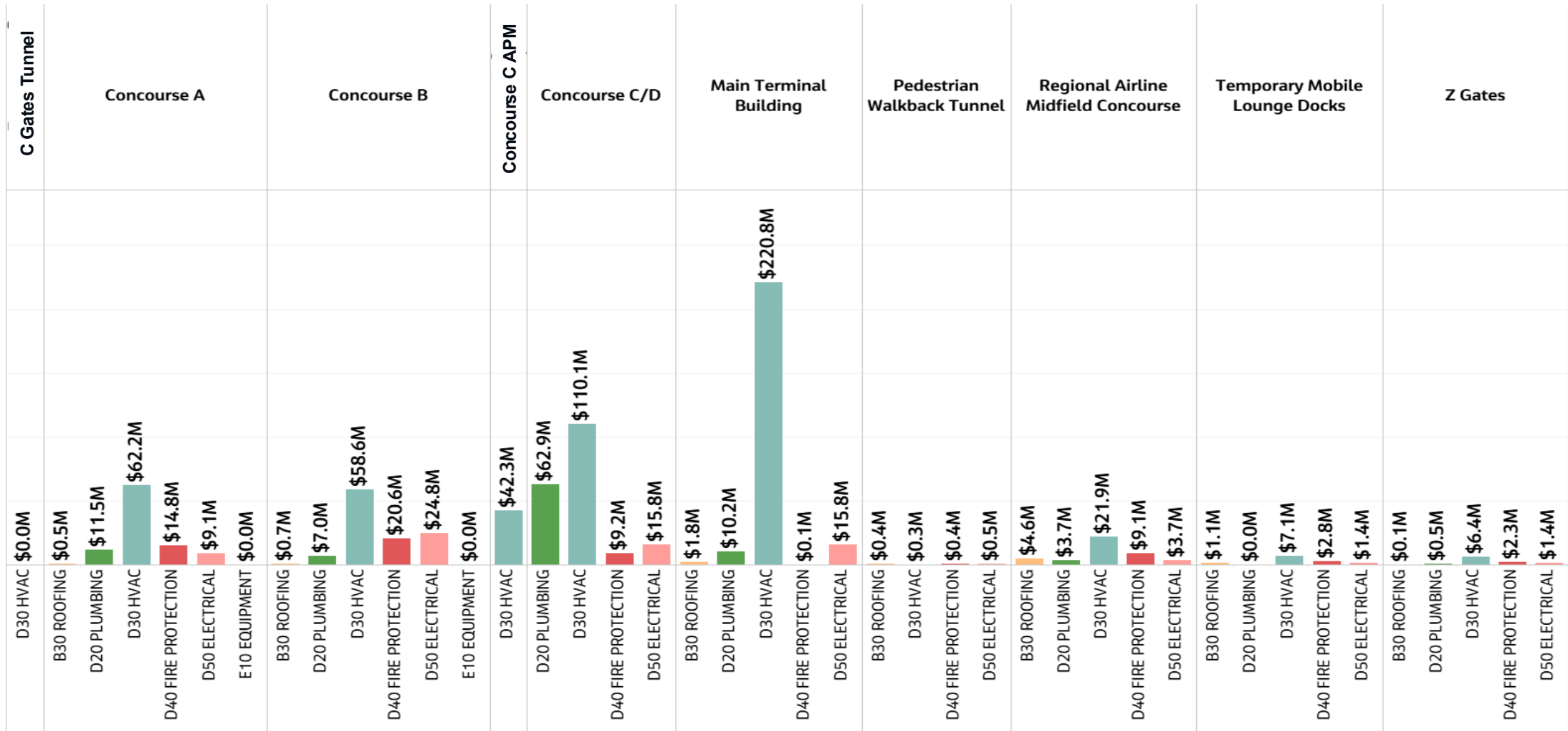
Risk Matrix of Assets With a Remaining Service Life <2 Years (IAD Passenger Facing Buildings)





IAD Systems w/ Highest Impact & Risk (<2 yrs)

Cost of Work Items of Assets by System with RSL <2 Years in Passenger Facing Buildings





Project Packaging

- **Because BULDER data can be complex and overwhelming, Jacobs is helping the Authority identify and plan projects that strategically bundle BUILDER-identified work items.**
- **Project packaging creates greater cost efficiency, minimizes the project planning process (due to fewer solo projects), creates a defined and consistent project prioritization criteria, and aligns with BUILDER's analytics and purpose of data-driven planning and lifecycle management.**
- **To create the project packages from the BUILDER data, the following criteria is considered:**
 - **Location**
 - **System**
 - **Condition**
 - **Priority**
 - **Remaining Service Life**



Project Packaging: Summary

IAD - Passenger Facing

Project Overview (FY26-28)

189

Number of Projects

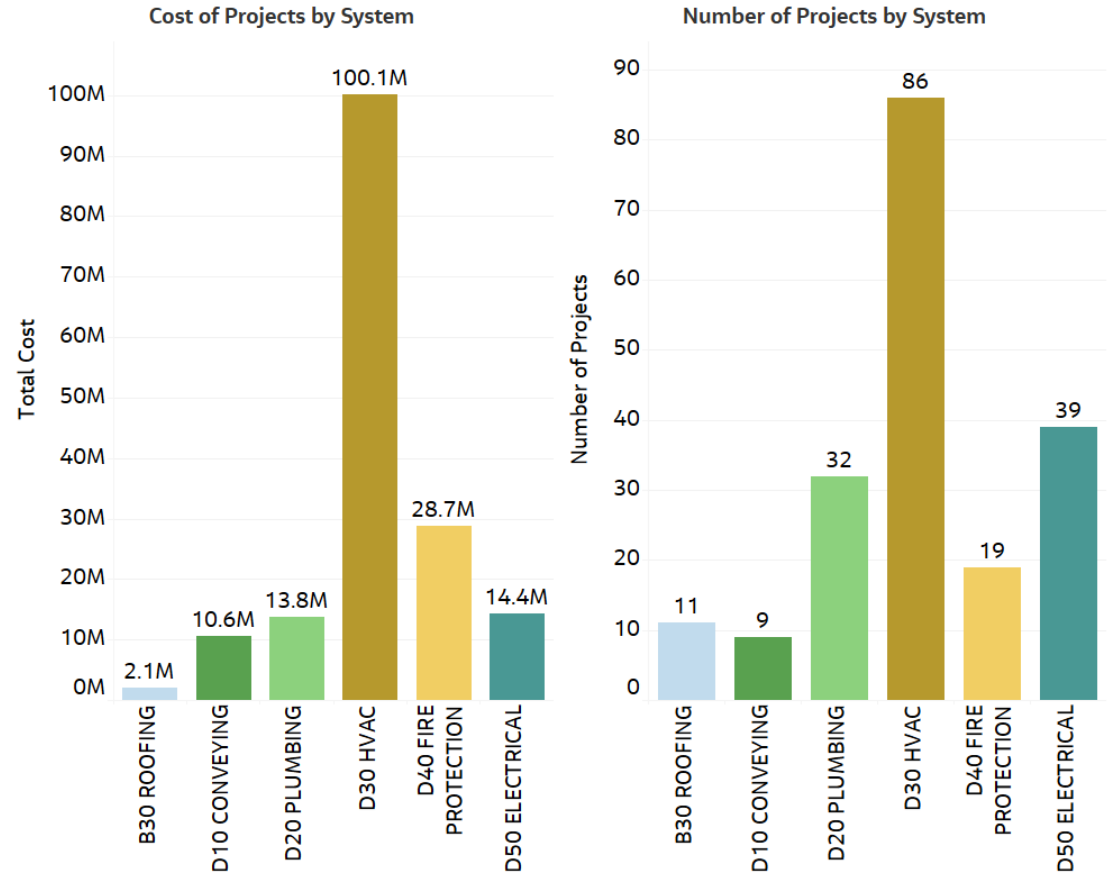
\$169,707,407

Total Cost

Project Breakdown by Fiscal Year

Fiscal Year	Total Cost	Number of Work Items	Number of Projects
2026	\$53,531,992	342	36
2027	\$64,514,892	394	49
2028	\$51,660,523	818	104

Number & Cost of Projects by System





Project Packaging Sample: Project P023

Replace Terminal & Packaged Units on Concourse C/D Roof

Project Overview

Example Work Items & Comments

57
Work Items

1 year
Avg RSL

39
Avg Condition Rating

2026
Fiscal Year

94.6
Priority Score

\$5,559,450
Project Cost

Replace 1 EA D3050 TERMINAL & PACKAGE UNITS SOUTH - RTU-115 D305006 PACKAGE UNITS Rooftop Unit - 25 ton

Replace 1 EA D3050 TERMINAL & PACKAGE UNITS ROOF - CONDENSER C-12S D305006 PACKAGE UNITS A/C Unit, Split Systems w/ Air Cooled Condenser - 10 TN

Replace 1 EA D3050 TERMINAL & PACKAGE UNITS ROOF - RTU-231 D305006 PACKAGE UNITS Packaged A/C, Air Cooled, Elec Heat - 20 ton, VAV

- All the packaged and condenser units have severe deterioration all over, on the fins, or are corroded and leaking.



Project Packaging Sample: Project P015

Replace Fire Protection System in Z Gates

Project Overview

Example Work Items & Comments

5
Work Items

3 years
Avg RSL

40
Avg Condition Rating

2026
Fiscal Year

95.0
Priority Score

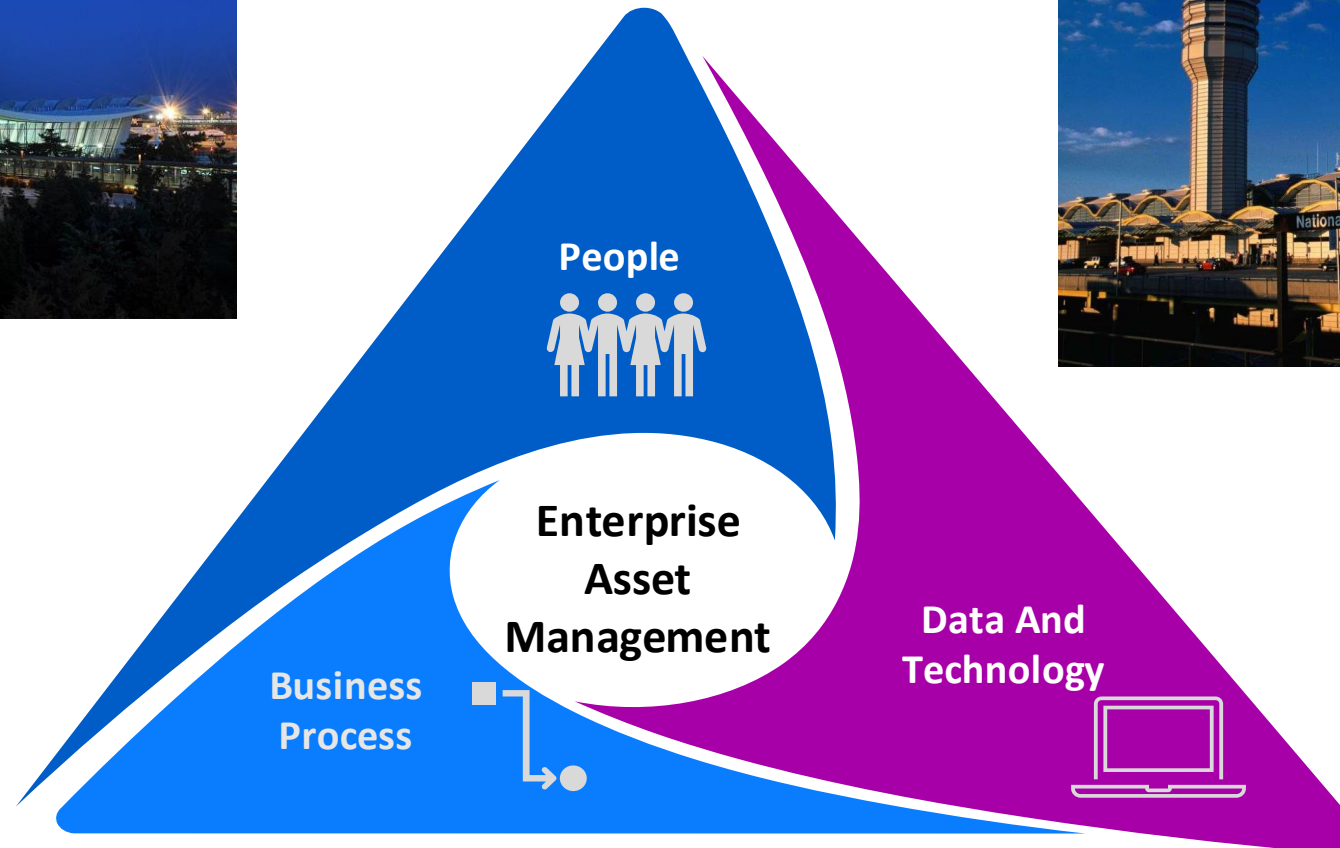
\$828,620
Project Cost

Replace D4040 SPRINKLERS D404001
SPRINKLERS AND RELEASING DEVICES
Deluge Systems - ordinary hazard

Replace D4010 FIRE ALARM AND
DETECTION SYSTEMS D401001 FIRE
ALARM DISTRIBUTION Control equipment -
fire alarm

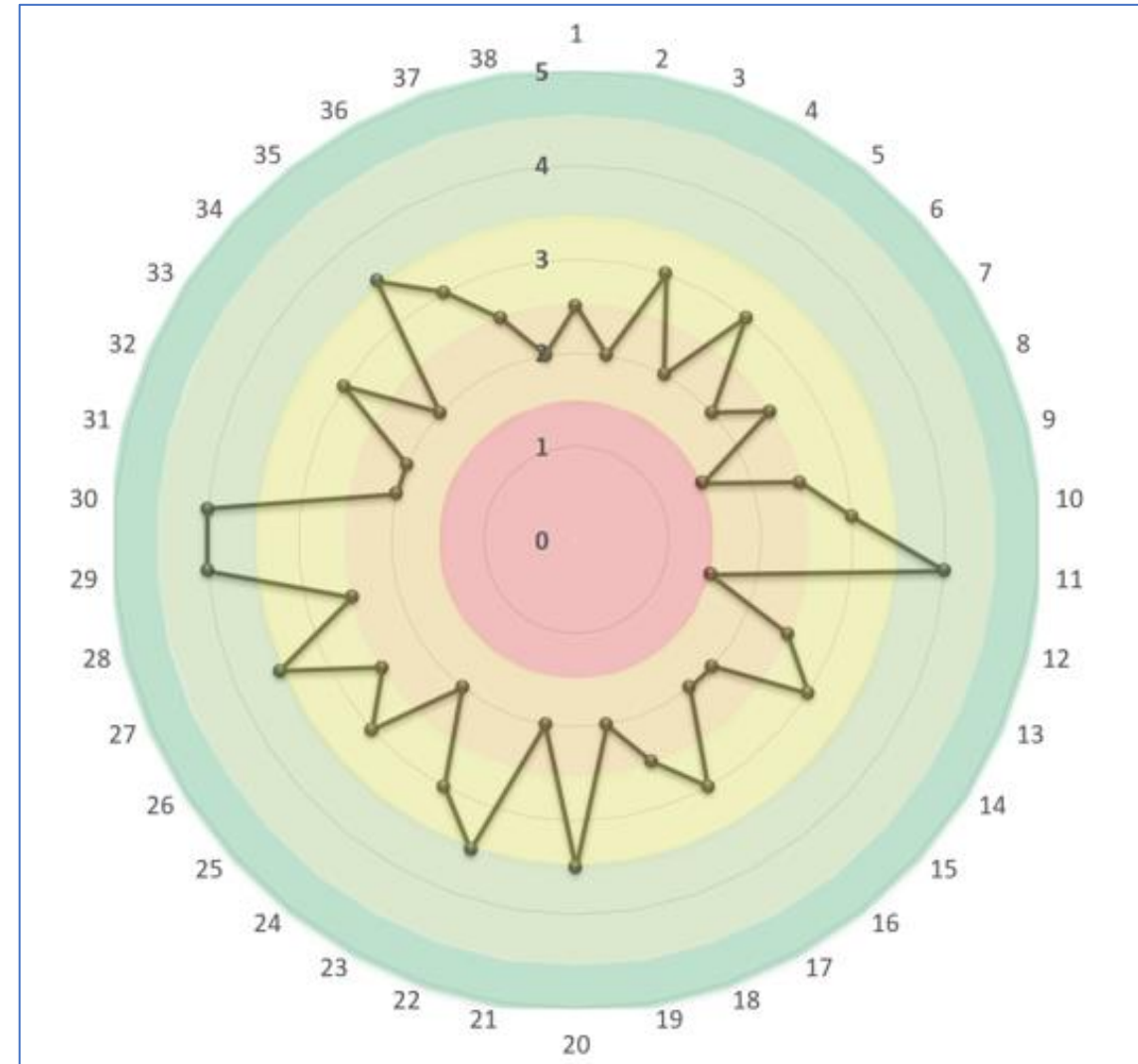
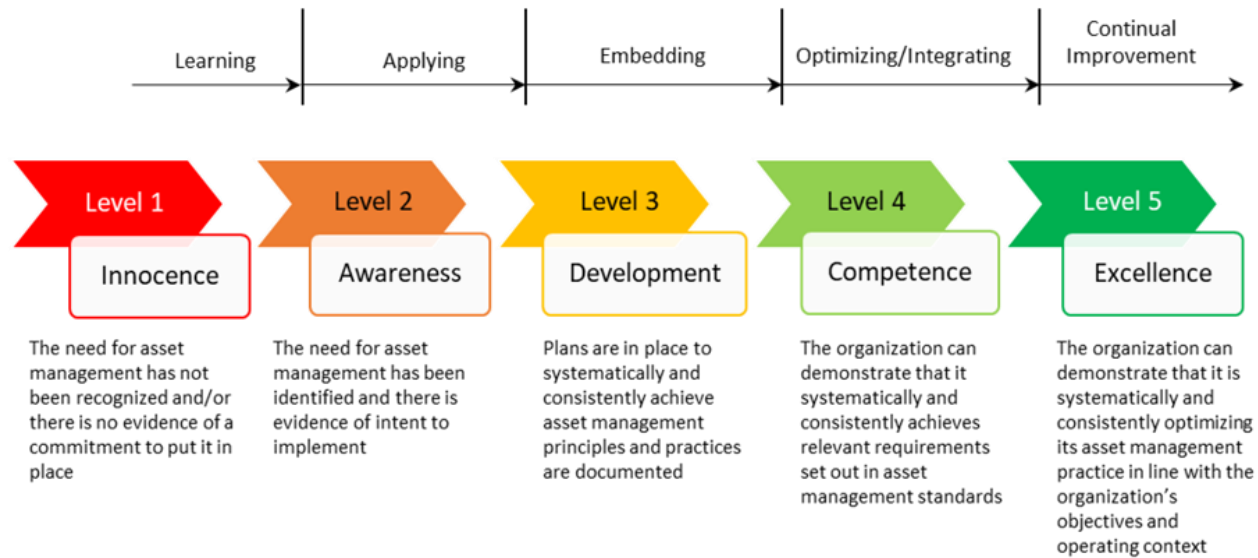
- Deluge system on the exterior is completely 100% operationally impaired
- Not in service due to leaking through the windows and causing flooding in the terminal
- Fire alarm devices on the exterior are significantly deteriorated on 100% of the devices

Enterprise Asset Management is a Journey



Comprehensive Asset Management Review and Assessment (CAMRA)

2021 Organizational AM Maturity Assessment (IAW IAM and ISO 55000)





- The roadmap is a 3-year path to improving organizational AM maturity
- The IAM themes that are not included were areas that MWAAs already performed well or were lower priority
- 3 key themes revisited in Jan 2026
 - **Theme 16 – Information Management**
 - **Theme 21 – Risk Framework (Asset Level)**
 - **Theme 24 – Capital Investment Plan Development & Governance**

MWAAs Asset Management Roadmap	2022		2023		2024	
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Facility Condition Assessment Program	Green	Green	Green	Green	Green	Green
Maximo Implementation Program	Green	Green	Green	Green	Green	Green
Asset Management Policy	Blue					
Strategic Asset Management Plan	Blue					
Prioritized Plan for AM Skills & Competences		Blue				
Communication & Change Management		Blue				
Asset Information Strategy	Blue					
Data quality improvements		Blue	Light Purple	Light Purple	Light Purple	Light Purple
Asset Risk Framework		Blue				
Long Term Renewals Planning		Blue	Blue			
Asset Management Plans	Light Purple		Blue		Blue	
Emergency Preparedness & Response			Blue			
Investigation of Major Asset Failures & Incidents			Blue			
Control of Documented Information			Blue	Blue		
Organizational Strategic Plan & Objectives					Blue	
AM Objectives - Performance Metrics					Blue	Blue
Asset Strategies					Blue	Blue
Capital Investment Plan Development & Governance					Blue	Blue
Prioritized Plan for IT Functional Requirements						Blue
Maturity Assessment Refresh						Yellow
Legend						
Existing Projects and Programs	Green					
New Initiatives	Blue					
Extension of Initiative (pre- or post-)	Light Purple					
Cyclical Refresh	Yellow					



EAM Program & BUILDER: and What This Means for the Authority

- Data-driven framework that guides investment decisions and supports MWAA's strategic goals
- Consistent lifecycle management that shifts MWAA from reactive fixes to proactive, planned renewal
- Accurate forecasting and prioritization that reduces long-term cost and improves budgeting transparency
- Objective condition and risk scoring to protect mission-critical operations and enhance system reliability
- Unified standards, shared data, and coordinated decision-making across departments

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Questions?



NAVFAC Updates

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