

ARE YOU SMARTER THAN YOUR DATA?

Using Condition Assessment
Data to Develop and
Prioritize Projects

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Uncontrolled Unclassified Information

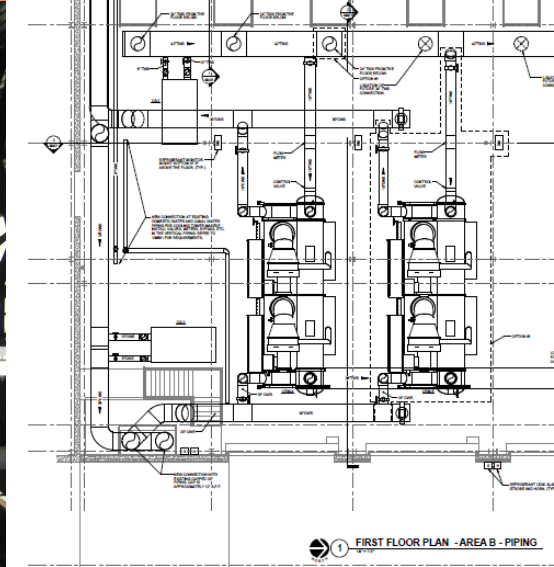
Agenda

- About Me
- Introduction
- Relevant Data
- Facility Prioritization (FIMS)
- IU Prioritization (CAIS)
- Results
- Digging Deeper
- Conclusions



My Career

- Drafter
- Project Engineer
- BIM Manager
- Project Manager
- Program Manager
- Department Head



Introduction

- Federal Government owns or leases \$1.2 trillion (2023) of property, plant, and equipment to support federal missions
- Deferred maintenance and repairs:
 - ◊ Total All Agencies: \$250B (2023), \$168B (2019)
 - ◊ Total DOE: \$12.4B (2023), \$8.5B (2019)
 - ◊ Total DOD: \$181B (2023), \$119B (2019)
- Limited annual budgets to address deferred maintenance and repairs
- Where should funding be allocated?

Introduction

- Each agency has **different approaches** and key performance indicators
- Department of Energy utilizes the **Facility Condition Index**

$$FCI = \frac{DM}{RPV}$$

- Department of Interior utilizes the **Comprehensive FCI**

$$CFCI = \frac{RN}{RPV}$$

- IG (TVA) recommends a **proactive & holistic** approach rather than focusing on failed or urgent IU's.

Relevant Data

- **Data from FIMS**
 - ◇ Property ID, Mission Dependency, Hazard Category, Mission Uniqueness, Core Capabilities
- **Data from CAIS (or similar)**
 - ◇ Property ID, IU number, Urgency, Condition, Volume Code, Repair Needs
- **Create a weighted portfolio value**
 - ◇ Facility Prioritization
 - ◇ IU Prioritization

Facility Prioritization

FIMS Value	Percentage	Value
Mission Dependency	80%	Normalized
Hazard Category	5%	Binary
Core Capabilities	10%	Normalized
Mission Uniqueness	5%	Binary

Mission Dependency

- FIMS Data Element

Mission Dependency	Value Hierarchy	Normalized Value
Mission Critical	3	1.0
Mission Dependent/Not Critical	2	0.67
Not Mission Dependent	1	0.33
Shutdown Status	0	0

Core Capabilities

- Total Number of Estimated Core Capabilities per Facility
- Enabling Infrastructure is evaluated for impact to programs and capabilities
- This differs from FIMS

Number of Core Capabilities	Normalized Value
24	1.0
23	0.96
22	0.92
0	0

IU Prioritization

CAIS Value	Percentage	Value
Urgency	33.33%	Normalized
Volume Code	33.33%	Normalized
IU Condition	33.33%	Normalized

Urgency

- Identified by CAS Inspectors
- CAIS Element
- Prioritize by level of Value

Urgency	Value Hierarchy	Normalized Value
Within 1 Year	5	1
Within 1-2 Years	4	0.8
Within 3-5 Years	3	0.6
Within 6-10 Years	2	0.4
Out Years (11+)	1	0.2
None	0	0

IU Condition

- Identified by CAS Inspectors
- CAIS Element
- Prioritize by level of Value

Inspection Unit Condition	Value Hierarchy	Normalized Value
Fail	4	1
Poor	3	0.75
Adequate	2	0.5
Good	1	0.25
Excellent	0	0

Volume Code

- NIST Uniformat II
- CAIS Element
- Identified by CAS Inspectors
- Prioritize by level of Value

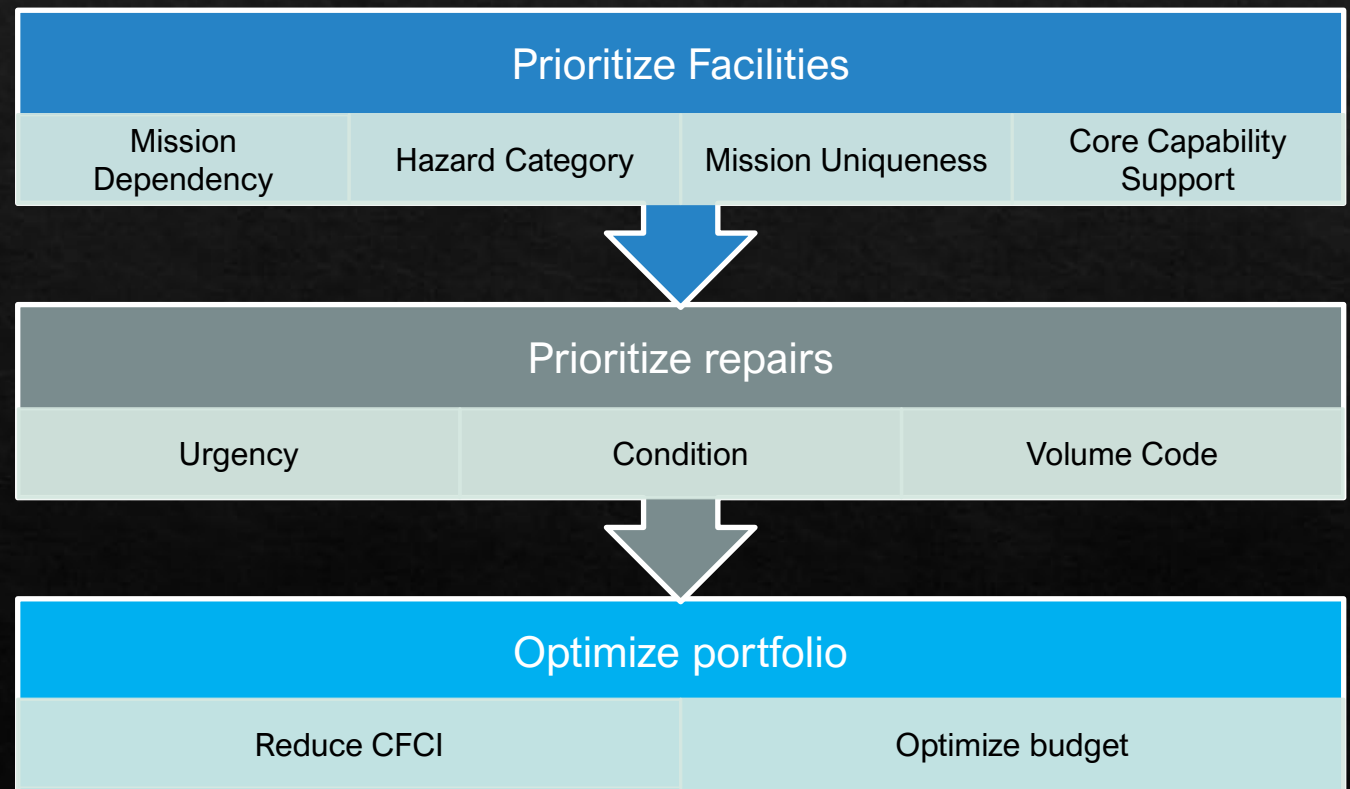
Volume Code	Value Hierarchy	Normalized Value
B30 (Roofing), D30 (Mechanical), D50 (Electrical)	5	1
A10 (Foundations), A20 (Basement Construction)	4	0.8
G10 (Sitework Prep), D10 (Conveying Systems)	3	0.6
F10 (Specialty Systems), C10 (Interior Construction)	2	0.4
F20 (Demo), E20 (Furnishings), etc.	1	0.2
Shutdown Status	0	0

Optimizing Lab Investments Using Data

- Next generation of infrastructure project planning, prioritization and data analysis will focus on reducing the metric for the Comprehensive Facility Condition Index (CFCI)

$$CFCI = \frac{RN}{RPV}$$

- Goal for CFCI = 0 by lowering the repair needs (RN) for an asset.
- Provide highest value investment with limited funding available.



Results

CFCI (Initial)	Optimized (All Buildings)	Optimized (Mission Critical Only)	Optimized (URGENT Only)	Optimized (Failed IU Only)
20.34	10.56	17.59	19.47	17.43

- Optimized utilizing R Studio and a \$10M funding constraint
- Recommended several impactful projects to reduce portfolio CFCI

But Wait
There's More

Digging Deeper into the Data

- RN >> RPV in some cases
- OSF RPV models were based on incorrect sizes
- Data input was inconsistent
- IU's had conflicting information
- Noncritical facilities were selected for investments

Digging Deeper into the Data

- Over the course of 2 years, a DOE SC lab rebuilt their real property portfolio from the ground up
- Each OSF was validated through engineers, SME's, and GIS (where applicable)
- CAS Inspections have improved through CAIS IU reviews to ensure standardization and consistency

Conclusions

- Results aligned with previous recommendations by the Inspector General for the Tennessee Valley Authority
- Results suggest this model can improve how decisions are made at federal facilities as well as contribute to longer term changes to data entry
- Results highlighted areas that could benefit from data value improvement
- Results suggest that a human element is recommended to determine final project funding allocations

Thank You

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