

# Strategies to Renew Federal Facilities

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## Relationship between Strategies to Renew Federal Facilities & USACE-ERDC-CERL SMS/BUILDER

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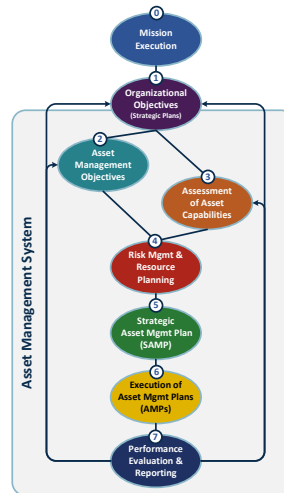
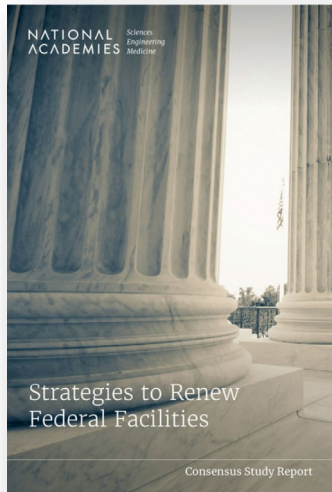
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# Strategies to Renew Federal Facilities



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## Report's Genesis and Authority

- Executed under the charter of the **National Academies of Sciences, Engineering, and Medicine**
  - Provides independent, objective advice to inform policy with evidence, spark progress and innovation, and confront challenging issues for the benefit of society.
- Overseen by the **Board on Infrastructure and the Constructed Environment (BICE)**
  - Advises the US Government's executive and legislative branches, other governmental and private sector organizations, and the general public on questions of technology, science, and public policy.
- Initiated by the **Federal Facilities Council (FFC)**
  - A cooperative association of federal agencies with the mission of identifying and advancing technologies, processes and management practices that improve the management, operations and evaluation of federal facilities throughout life cycle.

# Strategies to Renew Federal Facilities

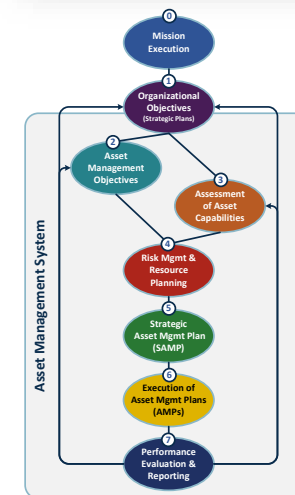
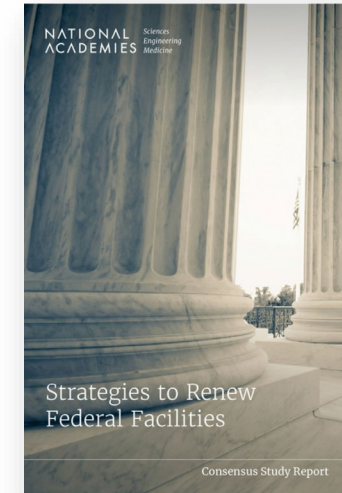


## Problem to be solved:

- Persistence of problems detailed in earlier NASEM studies
- Continued chronic underfunding of facility requirements
- Large and growing deferred maintenance backlogs
- Estimated 1/3<sup>rd</sup> of Federal Facility portfolio is excess or poorly aligned with mission needs

## Federal Facilities Council – Statement of Task:

- Develop broad-based, practical strategies to renew Federal facilities
- Define “how-to” renew facility portfolios and not “what to do”
- Solution to include feedback and communication strategies
- Ultimate objective, define how to present a mission-driven strategy to reinvest in Federally owned facility portfolio
- Fit solution into current policy and legislative context

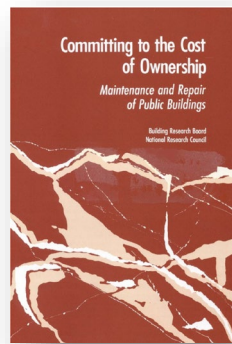


# Long Line of NASEM Studies on Facility Asset Management

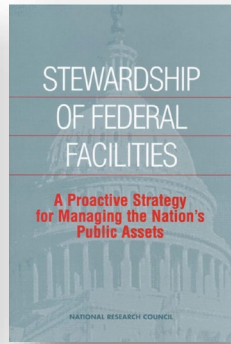


NASEM studies focus on how to make better investment business cases for facilities.

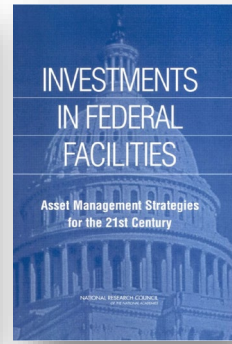
Each report made major contributions to the body of knowledge...



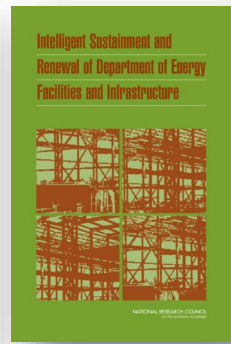
1990



1998



2004



2008



2008



2012



2019



2023



2023

1990 – 2-4% PRV Maintenance Target

2004 – EO 13327 and Federal Real Property Council

2008 – Weibel Analysis for Degradation Models

2013 – DoD/OSD BUILDER Policy Memo

**Strategies to Renew Federal Facilities** recommended the most ambitious level of change. The other reports made recommendations to improve policy, strategy, and business processes. **Strategies** made recommendations on how-to improved the management system used to manage assets.

# Putting Strategies' Recommendations in Context



## Strategies moved the Facilities Asset Management Goal Post.

To understand how Strategies moved the Goal Post, you need to understand the difference between “Asset Management” and “Managing Assets” perspectives.

### Asset Management

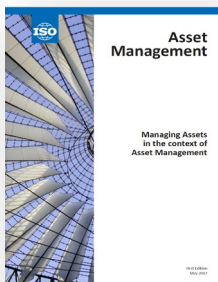
- Manages value generated by and through assets
- Focuses on risk-informed decision making
- Cost-Benefit Analysis (e.g. why you do something, ROI)
- Apex performance metric - Sustaining Mission Achievement
- Primary stakeholders – Executives, Stakeholders & Operators

### Managing Assets

- Manages asset across life cycle phases
- Focuses on work execution
- Cost-Effectiveness Analysis (e.g. how well you do something)
- Apex performance metrics – Asset and cost performance
- Primary stakeholders – Occupants & A/E/C/FM Professionals

Both perspectives are needed, but current policy and practice is dominated by the “Managing Assets” perspective.

Therefore, *Strategies'* recommendations focused on introducing and improving Federal agency “Asset Management” capabilities to better achieve mission and organizational objectives.



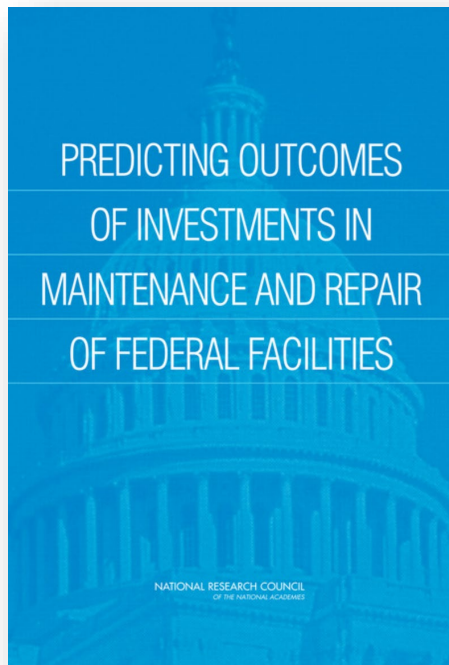
More info at ISO Technical Committee 251 article:

*“Managing Assets in the Context of Asset Management”*

Free download at:

<https://committee.iso.org/sites/tc251/home/news/content-left-area/news-and-updates/new-article-managing-assets-in-t.html>

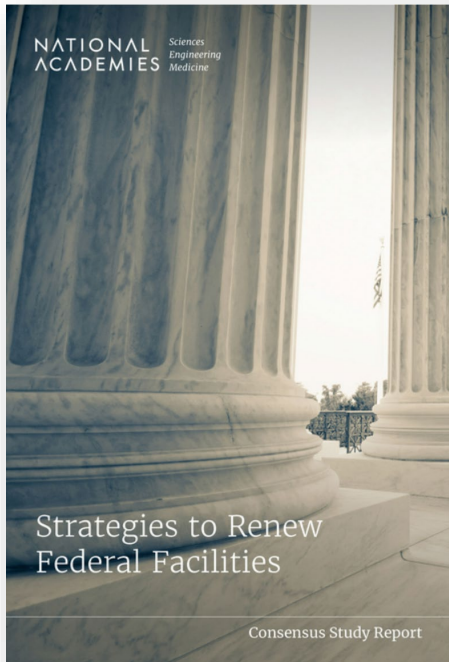
# Strategies' story begins with *Predicting Outcomes...*



2012

- Written to improve investment decision making.
- Supports classical “Managing Assets” approach
  - Predictive models to evaluate outcomes before investments are made to compare maintenance and repair alternatives
  - Models centered around service life predictions
  - Models needed to budget, allocate, and prioritize M&R resources
  - Recognized traditional approach based on summation of individual projects is problematic and better models and data are needed
- Identified leading sources and methods
  - BEA, Marshall & Swift, Whitestone, and ERDC SMS/BUILDER
  - Economic-based approaches good for facility recapitalization and modernization
  - Engineering-based approaches good for physical condition and service life predictions
  - Weibull degradation models should be updated based on observed conditions
- Recommendations included:
  - Recognized need for more strategic approaches for M&R investments
  - Develop and improve use of knowledge-based condition assessments
  - Models should focus on outcomes related to mission achievement

# Strategies' story begins...



2023

- 6 years after *Predicting Outcomes*, the Federal Facilities Council was not satisfied with progress on its recommendations.
  - Commissioned a new look at the problem and generate “how-to” guidance,
  - This Statement of Task led to publication of the *Strategies to Renew Federal Facilities*
  - Objectives for the authoring committee:
    - Define strategies that use actual outcomes of facility investments to inform investment decision making
    - Provide “how-to” guidance, not a “what to do” list, the report’s strategy and recommendations need to be action-oriented
    - Fit recommendations into the context of current Federal policies and strategies
- The Authoring Committee quickly recognized:
  - This is an entrenched problem, confirmed by 30+ years of reports and analysis
  - It is an “Asset Management” problem needing an “Asset Management” solution
    - Federal agencies already well demonstrated expertise in “Managing Assets”
    - This required looking at the problem differently, 30+ years of “Managing Assets” solutions have not effectively solved the chronic underfunding facilities problem
- First major hurdle was – defining Renewal.
  - The definition used in the report is a facility renewal strategy for a Federal agency includes the concept of “continual renewal” of the entire facility portfolio inclusive of MILCON, SRM, and base operations that are used to ensure agency operations and mission achievement.

# Strategies to Renew Federal Facilities



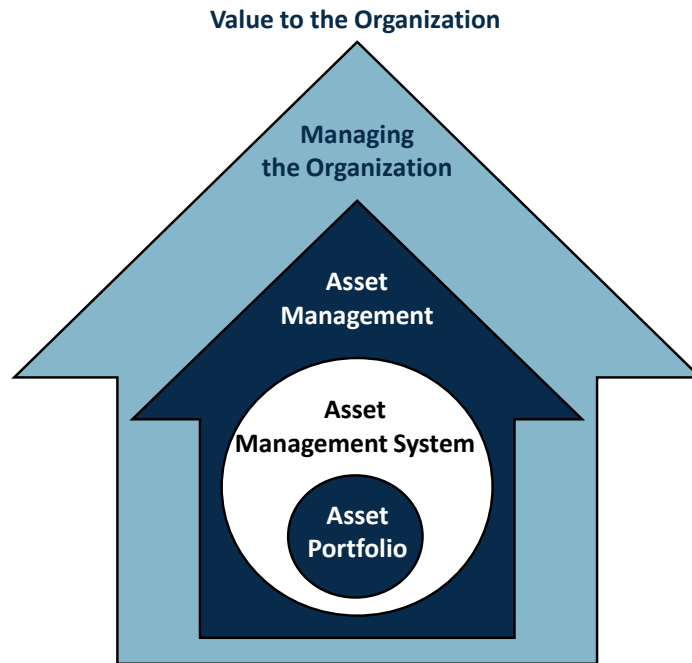
## What does all of this mean and how is it related to SMS/BUILDER?

- *Strategies* moved the Goal Posts
  - Moved investment perspective:
    - From “Managing Assets” (e.g. Asset Life Cycle Management (LCM))
    - To “Asset Management” (e.g. Value Generation and Asset ROI)
  - This requires new means and methods to generate Facility Renewal Strategies
  - Subsequently new Facility Models, Data, and Measures are needed
- Strategies to Renew Federal Facilities
  - Supports *Predicting Outcome’s* recommendation to use knowledge-based condition assessments
  - Recognizes SMS/BUILDER is the leading solution used in the Federal government for this
  - States that no current solution, i.e. BEA or SMS/BUILDER, fulfill requirements for renewal strategy development
  - Contains 24 Findings and 5 Recommendations for agencies on “how-to” improve asset management
    - Centers around development of a Facility Asset Management System that conforms with ISO 55000 principles and requirements
    - Recommendation #4 – covers need to improve renewal models, data, and measures
  - Defines an Asset Management Framework to streamline implementation of asset management improvements
  - Establishes 11 Asset Management System Implementation Principles to facilitate improvement
- SMS/BUILDER is in an excellent position to respond to these new requirements

# Strategies' Asset Management System

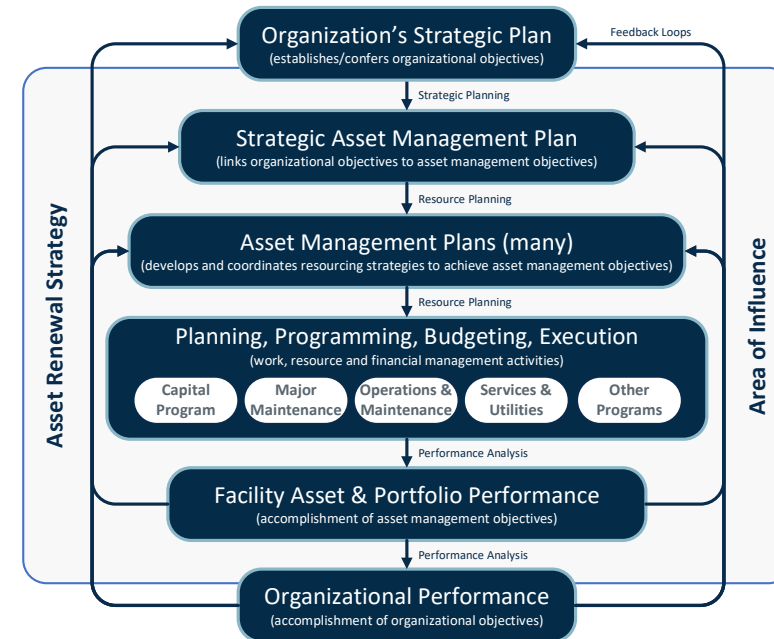


Asset Management is not about assets, its about managing the value generated from and through assets. - ISO 55000



Relationship of Key Terms

Derived from ISO 55000

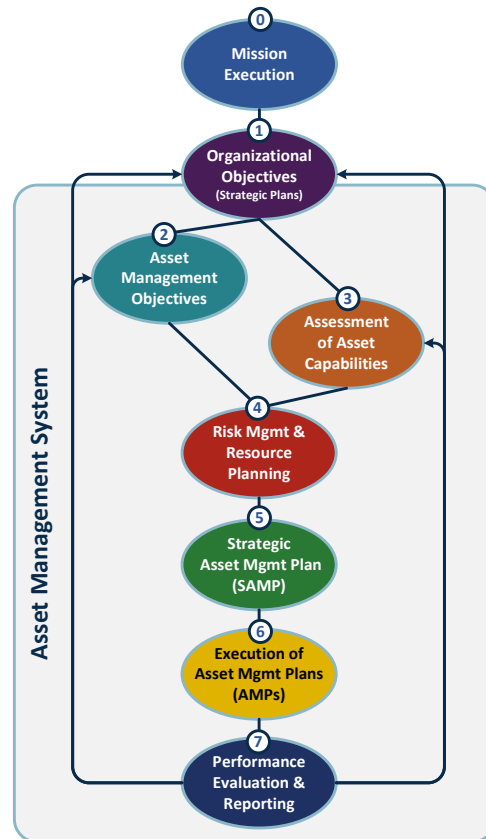


Management Coordination  
Line-of-Sight

An Asset Management System is implemented through policy, objectives, and processes used to achieve these objectives. - ISO 55000



# Strategies' Asset Management Framework



## Asset Management Framework

- Establishes governance for resource and investment decision-making
- Implemented through policy, focuses on value generation via management of assets
- Conforms with ISO 55000 to focus competency development and continual improvement

## SMS/BUILDER Development Alignment

- **MAG #2 – Asset Management Objectives**
  - Define and set SMS/BUILDER Policies and Standards
- **MAG #3 – Assessment of Asset Capabilities**
  - Coordinates SMS/BUILDER assessments. Processes and reports assessment data products
- **MAG #4 – Risk Management & Resource Planning**
  - Gaps between SMS/BUILDER defined Polices and Standards and actual conditions are reported as a candidate or requirement used in down stream planning
  - Other information, e.g. MDI, is used in planning and to support risk-informed decision making.
- **MAG #5 – Strategic Asset Management Plan (SAMP)**
  - SRM projects generated from SMS/BUILDER integrated with other sources are prioritized and prograded
- **MAG #6 – Execution of Asset Management Plans (AMPs)**
  - SRM projects generated from SMS/BUILDER are managed through specific execution programs
- **MAG #7 – Performance Evaluation & Reporting**
  - Completion of SRM projects generated from SMS/BUILDER is recorded
  - Planned v. Actual and Forecast v. Actual performance is evaluated,
  - Source to update SMS/BUILDER algorithms, and policies and standards

An Asset Management Framework coordinates risk management, communications, and decision-making through Management Activity Groups (MAGs) in the context of an ISO 55000 conforming Asset Management System.

# Asset Management Implementation Principles



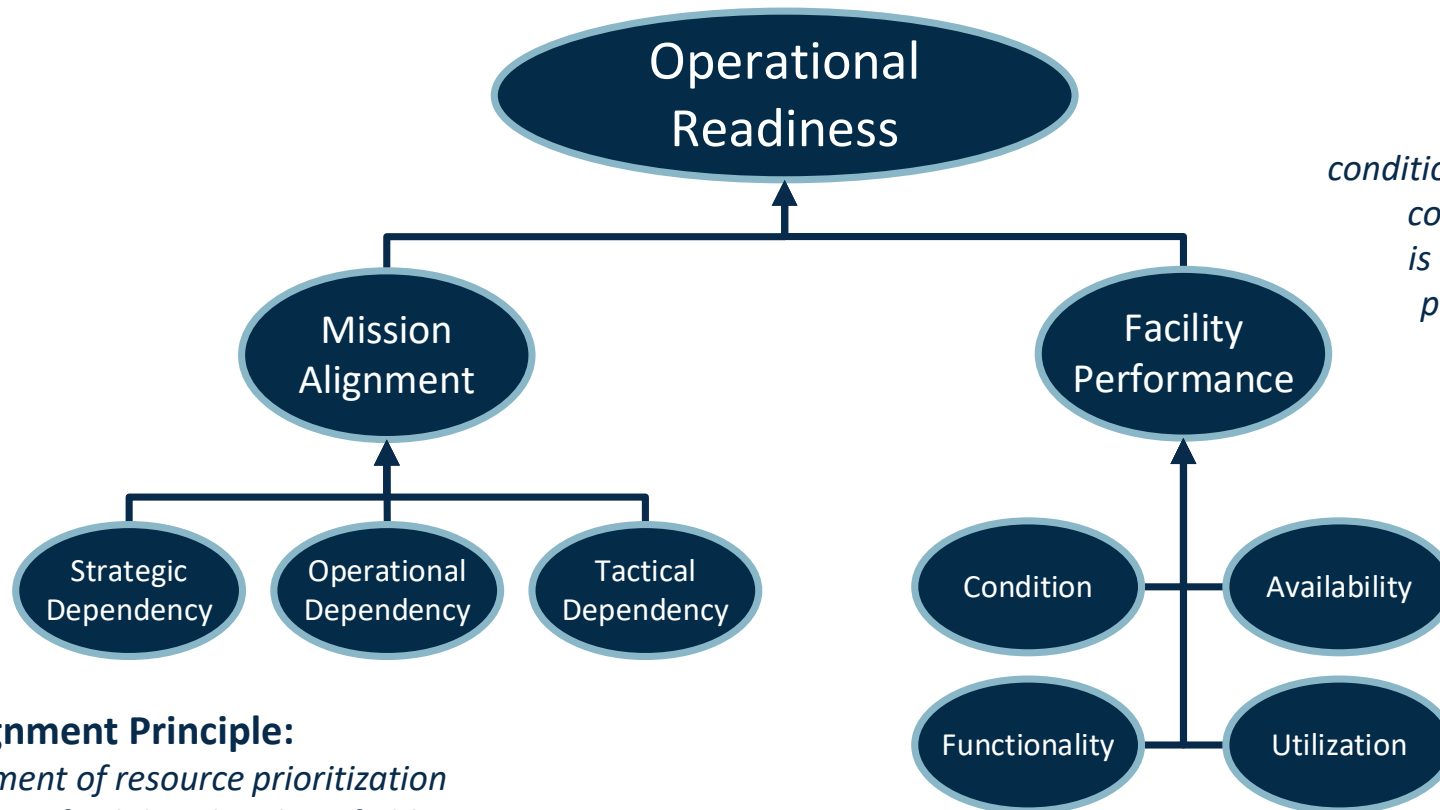
AMS Implementation Principles	Facility Renewal Strategy Decision Making	SMS/BUILDER Supporting Role
Data Integrity	Data is under enterprise configuration control based on AMS needs and requirements, controlled through definition and management of objectives	Data is under configuration control limited to SMS/BUILDER methodology and SOP
Whole Life-Cycle Cost Analysis	Integrates MILCON, SRM, & Base Operations across entire life cycles	SMS/BUILDER focuses on one economic decision point, that is repair or replace a system/component asset
Portfolio Management	Decision Making based on balancing risks across asset portfolio using a system-of-systems approach to achieve mission/organizational level objectives	SMS/BUILDER builds up from component level focused on condition, and is not yet able to do portfolio-level analysis
Accounting Transparency	Requires integration of financial and non-financial data in decision-making that can support planned versus actual organizational performance comparisons	SMS/BUILDER is not integrated with financial data and does not yet support planned v actual condition analysis
Mission Alignment	Decision making must use risk-based metrics that link facilities to mission and operational performance (e.g. MDI, API, etc.)	SMS/BUILDER can use external data through Policies and Standards to mission-weight replacement forecasts
Facility Performance	Decision making of facilities must account for the following four performance criteria: condition, functionality, availability, utilization	SMS/BUILDER only accounts for condition
Decision Making Alignment & Accountability	Decision making must integrate and reconcile objectives, resources, and performance management activities to promote trust	SMS/BUILDER does not directly support investment decision making, it is only an input for other decision-making processes
Operational Readiness	Facility Operational Readiness on a portfolio level must be defined and balanced across a range of investment scenarios and time horizons.	SMS/BUILDER supported analysis is limited to facility condition forecasts and specific asset systems or components
Performance-Budget Integration	Investment decision-making frameworks must evaluate planned-versus actual performance in the context of budget development.	SMS/BUILDER partially does this focused on condition modeling, but not in the context of budget or allocation tradeoffs
Balance Sheet Analysis	Decision-making credibility is based on a comprehensive & exhaustive comparison of requirements and capabilities using a balance sheet analysis	SMS/BUILDER does not have this capability
AMS Maturity	Facility asset management systems must be periodically and rigorously assessed and using an objective maturity definition and scale, e.g. ISO 55001	SMS/BUILDER is not evaluated in terms of maturity

A straight-up comparison between a Federal Facility Renewal Strategy and SMS/BUILDER is unfair for two reasons. 1) Strategies moved the Goal Posts, so the basis of comparison is no longer a “Managing Assets” analysis, it is an “Asset Management” one. 2) SMS/BUILDER was never designed nor intended to support this type of analysis. The correct viewpoint is SMS/BUILDER is a tool that can be evolved to support a Facility Renewal Strategy.

# Asset Management Implementation Principles



**Operational Readiness Principle:** *The relationship between agency operational readiness and the levels of facility operational readiness delivered by federal facility renewal strategies must be balanced across a range of relevant investment horizons and resourcing strategies.*



**Facility Performance Principle:** *Knowledge of each facility asset's condition, functionality, availability, and utilization compared with agency-established standards is required to understand the capabilities and performance of facility assets and portfolios.*

## Mission Alignment Principle:

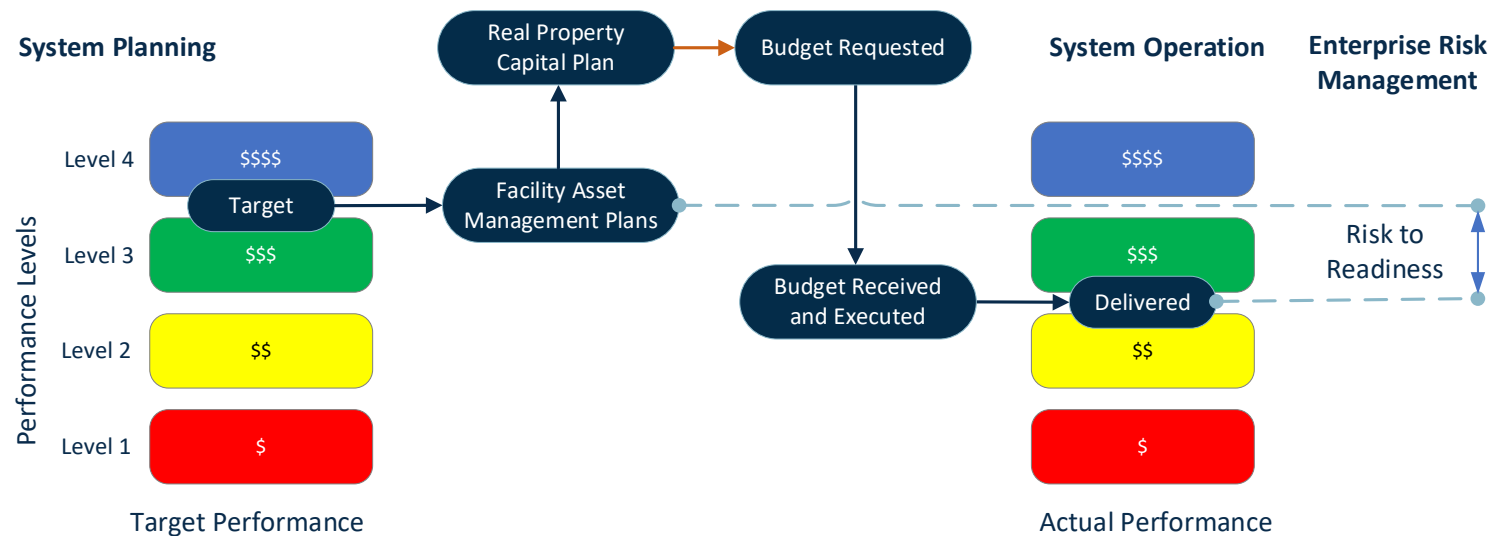
*Mission alignment of resource prioritization requires the use of validated and verifiable metrics to link the relative importance of individual facility assets to agency missions and stakeholder performance expectations.*

# Asset Management Implementation Principles



**Decision-Making Alignment and Accountably Principle:** *Facility asset management system decision making must integrate and reconcile objectives, resources, and performance management activities to promote stakeholder confidence in them.*

## Facility Asset Management System – Performance-Budget Integration Framework



Graphic Source: U.S. Army Corps of Engineers, 2012, Project Maintenance Management Development Guidelines, Washington, DC

**Performance-Budget Integration Principle:** *Investment decision-making frameworks must evaluate planned versus actual performance in a way that can simultaneously measure a performance gap (e.g., a requirement) and the means to remedy the gap related to budget development.*

# And One More Item...



## RECOMMENDATION 4: Improve Federal Facility Models, Data, and Measures:

*Includes the statement*

Furthermore, the General Services Administration (GSA), in coordination with the Federal Real Property Council and under the direction of OMB, should **create an independent database of component inventories for federal facilities, beginning with the extensive data collected for the BUILDER system, and make it available to qualified users and accessible by popular capital planning and facility management systems.** The senior real property officials of all agencies would submit information to GSA for compiling, as directed by executive requirement.

The purpose of the recommendation is to accelerate innovation supporting the development of Facility Renewal Strategies by making facility portfolio data available to other authorized / screened research organizations

# Next National Academies Workshop



## Facility Resource and Investment Decision Making Workshop

- Invites government, industry, and academia to expanded on *Strategies to Renew Federal Facilities'* Recommendation #4:

**Improve models, data, and measures  
used to develop and manage  
Federal Facility Renewal Strategies.**

- To be scheduled this fall and held at the National Academies



# Backup Slides

# Strategies to Renew Federal Facilities



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  - Advises the US Government's executive and legislative branches, other governmental and private sector organizations, and the general public on questions of technology, science, and public policy.
- Initiated by the **Federal Facilities Council (FFC)**
  - A cooperative association of federal agencies with the mission of identifying and advancing technologies, processes and management practices that improve the management, operations and evaluation of federal facilities throughout life cycle.

## FFC's Statement of Task:

An ad hoc committee of experts will identify broad based and practical strategies for **Federal agencies to reinvest in -- to renew -- their facility portfolios** in alignment with their authorized purpose. The committee will **focus on the "how to do"** and not the "what to do" to sustainably adapt, restore, recapitalize, and replace facilities needed to perform agency operations and achieve mission objectives. This "how to do" focus will consider different, critical stakeholder perspectives, requirements and expectations. Further, the study will recommend feedback and communication **strategies and practices for measuring the actual (as opposed to predicted) outcomes of facility investments dedicated to the delivery of a continuous stream of benefits and value.** Finally, the study will include options and strategies on how to present a mission-driven strategy to reinvest in Federally-owned facility portfolios.

# Strategies to Renew Federal Facilities



## Recommendations – “how to” implement an asset management approach:

### 1. Implement a Federal Facility Asset Management System

- Comprehensive, principle-based asset management iaw ISO 55000 Asset Management System standards
- Clarify SRPO responsibilities for risk-based decision making in Circular A-136 – Financial Reporting Requirements
- Fix OMB Circular A-11, Section 83 – Object Classification (i.e. to support asset-based financial accounting)

### 2. Implement a Real Property Capital Plan (iaw OMB M-20-03 & M-22-14)

- Require the Agency’s Real Property Capital Plan be used to justify the Budget iaw OMB A-11 Capital Programming Guide
- Use the Real Property Capital Plan to reconcile and risk-inform agency objectives, budget, and facility programs

### 3. Update the National Strategy for Efficient Use of Real Property (iaw OMB M-20-10)

- Link and coordinate agency Real Property Capital Plans with National Strategy for the Efficient Use of Real Property

### 4. Improve Federal Facility Models, Data, and Measures

- Improve renewal cost estimates and reporting through better forecast models and analysis

### 5. Implement Federal Facility Renewal Budgeting Strategies

- Improve budget authorities to include working capital funds, revolving funds, and public-private ventures to accelerate value generation through execution of Real Property Capital Plans

# Strategies to Renew Federal Facilities



- Finding 4-1: At this time, Builder is ill-suited for estimating renewal costs. Its inspections do not collect restoration and modernization data and its cost forecast process has not been properly verified and validated.
- Finding 4-2: The extensive component inventory created for use with Builder is, by itself, a valuable resource. After addressing privacy and security concerns, the inventory data could be made available to facility managers and qualified researchers. The data could also be used by other models capable of estimating renewal and other facility costs.
- Finding 4-3: Predicting federal investment requirements for facility renewal is difficult because they are noncyclical and consist of largely unrelated restoration and modernization costs. However, the geometric depreciation model addresses the same costs as those for restoration and modernization, making it a reasonable approach to estimating renewal requirements.
- Finding 4-4: The DoD recapitalization metric was an estimation approach that was readily understood and easily applied by planners and facility management. The geometric depreciation model has greater technical credibility and can be just as convenient to use if renewal requirements are expressed as simple cost factors by facility category, similar to the DoD sustainment cost model.
- Finding 4-5: Capital depreciation rates are primary inputs for estimating restoration and modernization rates using the geometric depreciation model, and more broadly for estimating the net value of national capital assets. The BEA maintains an aging set of deprecation rates, patterns, and service lives for the categories residential and nonresidential structures. If revised, these data would improve renewal cost estimates, particularly for nonresidential structures.

# Strategies to Renew Federal Facilities



**RECOMMENDATION 4: Improve Federal Facility Models, Data, and Measures:** The Office of Management and Budget (OMB) should clarify guidance requiring agency senior real property officials to **improve cost estimates of renewal requirements**. Currently, there is no broadly accepted approach to estimating renewal costs, which diminishes the credibility of renewal decision making. After considering two of the methods available, the committee recommends the following:

- Senior real property officials should adopt an economic depreciation approach for estimating renewal costs, tailorable to each agency's facility portfolio. As a starting point, the model could be simplified to a set of cost factors by facility type, analogous to the Department of Defense Facility Sustainment Model.
- Agencies should include existing dated depreciation rates and service lives in the economic depreciation approach review by using a schedule established for the revision of depreciation rate and service life data used in depreciation models, which is currently provided by the Department of Commerce's Bureau of Economic Analysis.

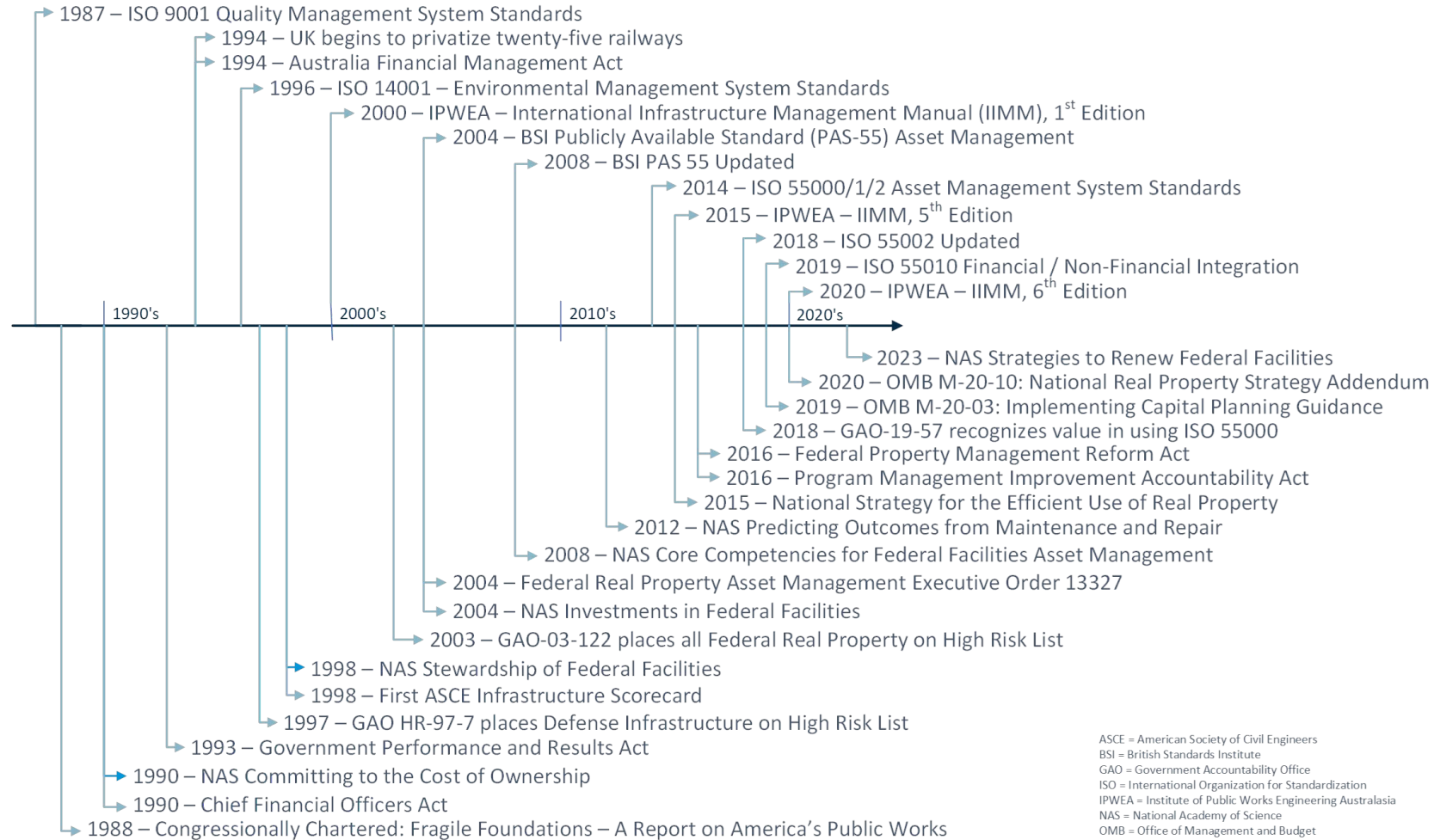
Furthermore, the General Services Administration (GSA), in coordination with the Federal Real Property Council and under the direction of OMB, should **create an independent database of component inventories for federal facilities, beginning with the extensive data collected for the BUILDER system, and make it available to qualified users and accessible by popular capital planning and facility management systems**. The senior real property officials of all agencies would submit information to GSA for compiling, as directed by executive requirement.

# Strategies to Renew Federal Facilities



## Significant Milestones in the Evolution of Facility Asset Management in the US Federal Sector

### International Milestones



### US Milestones

ASCE = American Society of Civil Engineers  
 BSI = British Standards Institute  
 GAO = Government Accountability Office  
 ISO = International Organization for Standardization  
 IPWEA = Institute of Public Works Engineering Australasia  
 NAS = National Academy of Science  
 OMB = Office of Management and Budget  
 UK = United Kingdom