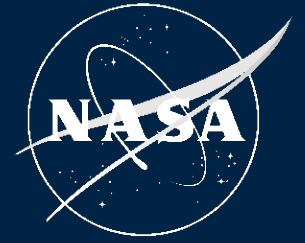


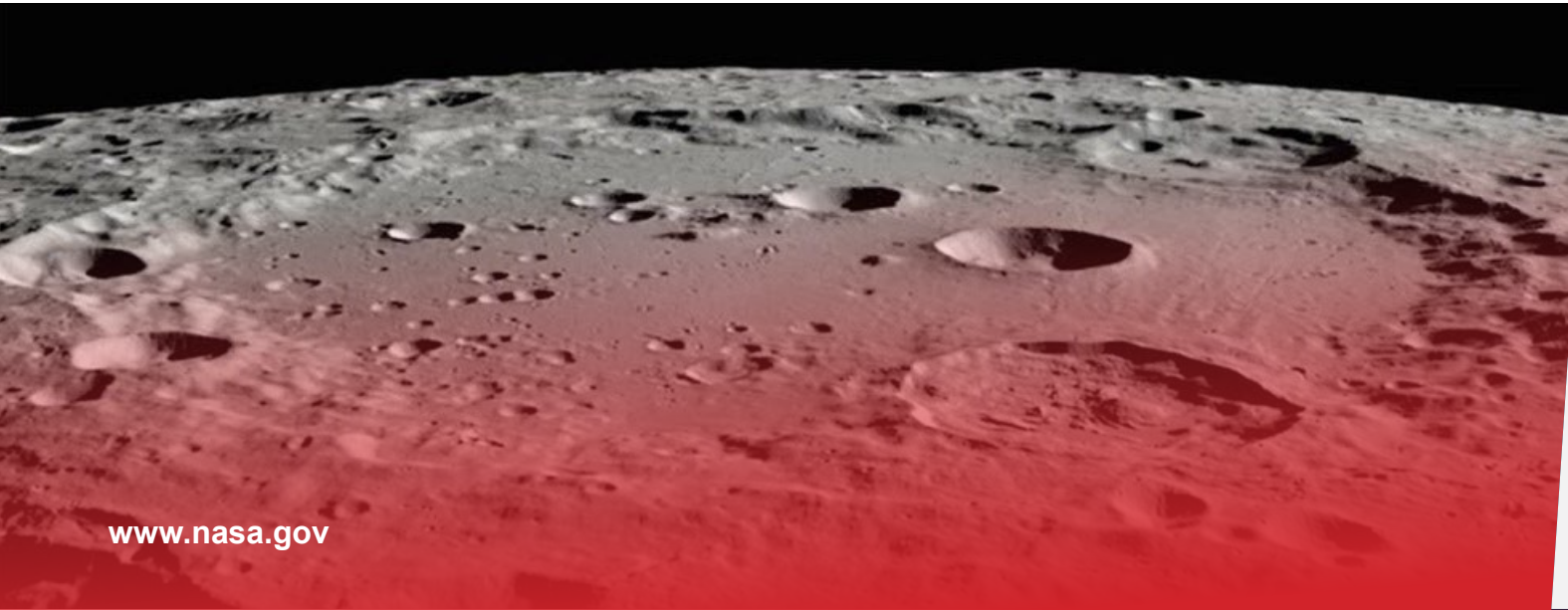
National Aeronautics and Space Administration



NASA Physical Infrastructure Briefing to the Defense Nuclear Facilities Safety Board

Dr. Joel Carney
Dr. Erik Weiser

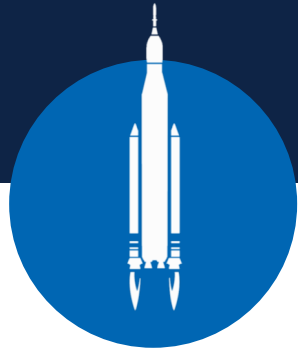
Aug 14, 2024



www.nasa.gov

Office of Strategic Infrastructure
Mission Support Directorate
NASA Headquarters

NASA Physical Infrastructure From Strategy to Execution



NASA Mission Requirements

DRIVE



Agency Master Plan (AMP)

DRIVES



Capital Investment Program Plan

DRIVES



Investments, Divestments & Sustainment Decisions

- DISCOVER** EXPAND HUMAN KNOWLEDGE THROUGH NEW SCIENTIFIC DISCOVERIES
- EXPLORE** EXTEND HUMAN PRESENCE TO THE MOON AND ON TOWARDS MARS FOR SUSTAINABLE LONG-TERM EXPLORATION, DEVELOPMENT, AND UTILIZATION
- INNOVATE** CATALYZE ECONOMIC GROWTH AND DRIVE INNOVATION TO ADDRESS NATIONAL CHALLENGES
- ADVANCE** ENHANCE CAPABILITIES AND OPERATIONS TO ACCELERATE CURRENT AND FUTURE MISSION SUCCESS



Centralized Management via AMP approved in OCT of 2023

- 2 years to complete with all stakeholders
- Previous model: 10 Center Master Plans

THE WHY?

- **83% of Facilities Beyond Design Life:** increased burden on maintenance/repair and renewal
- **Previous Management Model:** growth, redundancy and deteriorating horizontal/institutional infrastructure
- **Flat to Declining Budget:** as condition goes down risk goes up

OSI charged with changing infrastructure portfolio management approach to improve mission readiness, reliability, and affordability

Current State: Facility Condition Index by Discipline and Center

	Active Thermal	Aercoalescence	Avionics	Cryogenics	Power	ECES	Flight Mechanics	Human Factors	Loads and Dynamics	Materials	Mechanical Systems	Nondestructive Evaluation (NDE)	Passive Thermal	Propulsion	Sensors and Instrumentation	Space Environments	Structures
ARC		Red	Yellow		Yellow	Yellow	Red	Yellow	Red	Red	Green	Yellow	Yellow		Red	Yellow	Red
AFRC		Yellow	Yellow				Yellow		Yellow			Red	Yellow		Green		Yellow
GRC	Green	Red	Yellow	Yellow	Yellow	Yellow			Red	Yellow	Red	Red	Yellow	Yellow	Red	Yellow	Red
GSFC	Yellow		Red		Red		Yellow		Red	Red	Red	Yellow	Red		Yellow	Yellow	Red
JPL	Yellow	Green	Yellow		Yellow	Green	Yellow		Yellow	Yellow	Yellow		Yellow	Yellow	Yellow	Yellow	Yellow
JSC	Red	Red		Red	Yellow	Red	Red	Yellow	Red	Red	Red	Red	Red	Yellow		Red	Red
KSC	Red			Red		Yellow			Red	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow
LaRC		Red	Red				Yellow	Red	Red	Yellow		Yellow	Yellow	Red	Red	Yellow	Yellow
MSFC	Yellow	Green	Red	Yellow	Red	Yellow			Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow
SSC				Yellow								Yellow	Yellow				
Overall	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow



GRC Exhaust Stack Erosion
FY17

JSC Potable Water Rupture
FY18

ARC Arc Jet Fire
FY19

MAF Roof
FY20

Arc Flash Issues
FY21

GRC Transformer Fire
FY22

Wallops Causeway Bridge
FY23

AFRC, GRC, LaRC, SSC Sewer Systems
FY24

Timeline of NASA critical asset failures

AGENCY MASTER PLAN TENETS

Agency Master Plan Mission

*“Provide and sustain a **Mission-Driven and Affordable Real Property Portfolio** for the missions and people of NASA today and the future.”*



The AMP Enterprise Approach will Enable...

1. Mission-Aligned Portfolio

- Tie to Mission Requirements
- Integrated Asset Management

2. Mission & Data-Driven Business Case

- Mission Relevance (MR) Scoring
- Collaboratively Managed Assets

3. Budget Recommendations

- Portfolio Management
- Data-driven Affordability Metrics
- Agency Capital Investment Program Plan (CIPP)

4. Standardized Planning Guidance

- NASA Planning Checklist



Goal 1:

Mission-Driven & Adaptable to Transformation

Goal 2:

Stakeholder Accountability

Goal 3:

Affordable Portfolio

Goal 4:

Risk Mitigation

Goal 5:

Sustainability Best Practices

Goal 6:

Inspire our Workforce

OSI
Goals

Readiness

Affordability

Sustainability

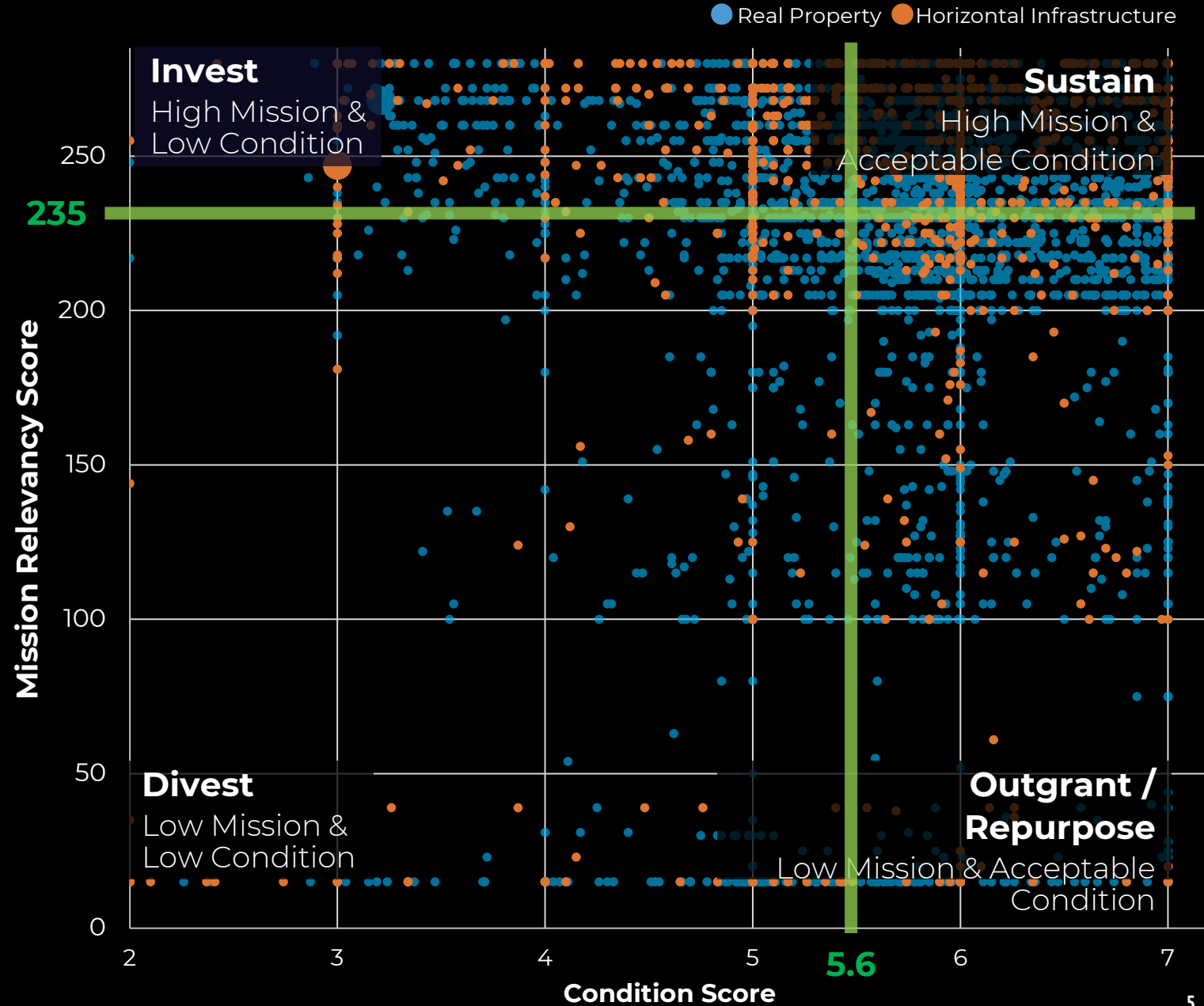
Workforce

EXECUTION PLAN

"Our priority is to invest in enabling infrastructure considered essential and in poor condition, the loss of which would have debilitating impacts"

~ SOMD/ESDMD Prioritization Perspective

REAL PROPERTY "BUCKETING" MATRIX



DIVESTMENTS

The AMP identified 430+ potential new assets for the demo list for a total of 760+ identified potential divest assets

The AIA Divest list, Summit Divest List, and the Demolition Program List have been merged and adjudicated into one final list

- 760+** Real Property Assets For DEMO
- ~\$39M** Cost Model (CM) Annual Maintenance
- ~\$394M** Deferred Maintenance
- ~\$20M** 10-Yr Avg. Annual Maintenance
- ~4.3M** SQFT



HIGH MR ← → LOW MR

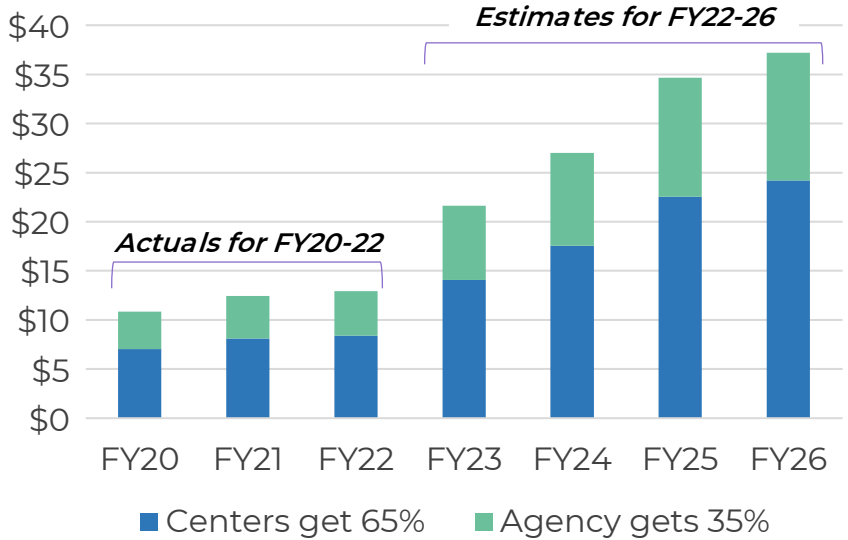


Compliant (FCI >4.3) Fair to Marginal (FCI 3.7-4.3) Poor (FCI <3.7)

760+ identified potential divest assets will take **6-11 yrs to fund** with the annual demo budget

OUTGRANT* – EUL PROCEED SUCCESS

NET PROCEED SPLIT (\$M)



\$37M

Projected EUL proceeds for FY26

- Enhanced-Use Leases (EUL) proceeds must be used for maintenance
- Buy-down potential will continue to grow with increasing outgrants

**Any real property asset identified as a potential outgrant must be 1) coordinated through OSI, 2) have a future NASA need, and 3) be in the best interest of the Agency.*

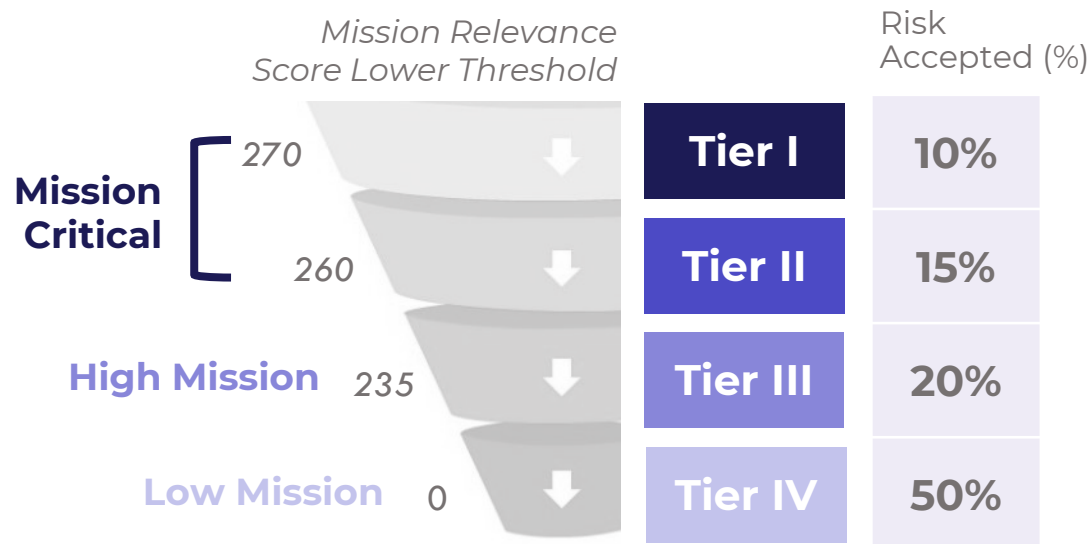


SUSTAINMENT STRATEGIES

TIERED MAINTENANCE RISK ACCEPTANCE

All real property has been tiered based on Mission Relevancy (MR). Minimal risk accepted in Tier 1 and increased for each lower tier. Critical maintenance completed for all tiers. Potential to use data to set budgets by Tier and not by Center

- **Responsible Parties:** OSI & Centers
- **Effective Date:** Immediate start with continuous management

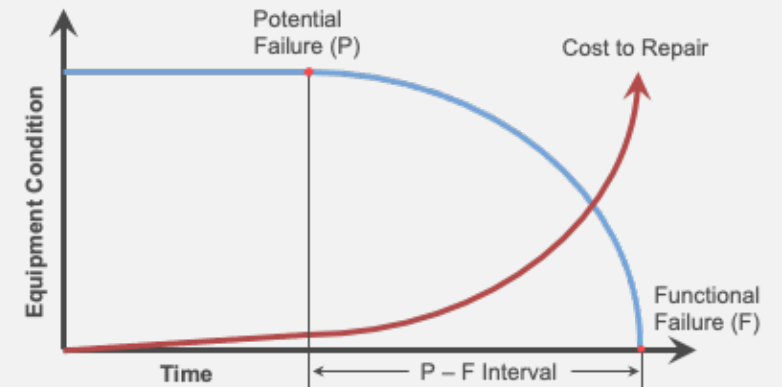


PREDICTIVE MAINTENANCE (PdM)



OSI is developing and implementing a consistent Agency-wide PdM strategy (e.g. Condition Based Maintenance (CBM)) aligned to Tiered Maintenance

- PdM and Predictive Testing & Inspection (PT&I) has the potential to drive down repair costs by as much as 66%
- Agency Cost avoidance to date exceeds ~\$60M for all Centers
- **Responsible Parties:** OSI & Centers



INVESTMENT STRATEGY

To achieve NASA 2040, we need to collaboratively plan how we allocate funding Agency-wide.

The Agency CIPP integrates the following projects:

- **General Maintenance**
- **Institutional CoF**
- **Programmatic CoF**
- **Demolition / Consolidation**
- **Energy Savings Investments**
- **Environmental Compliance & Restoration**

Category	Definition
<p>Repair</p>	<p>Fix degraded assets</p> 
<p>Modernization</p>	<p>Revitalize existing capabilities</p> 
<p>Recapitalization</p>	<p>Replace degraded assets</p> 
<p>New Capability</p>	<p>Construct new capabilities</p> 

Summary

Agency Master Plan Actions will:

- Improve the affordability of the infrastructure portfolio (divest or outgrant facilities with low mission need)
- Improve readiness of our facilities to support growing mission activities
- Instill maintenance and monitoring strategies (tiered maintenance and reliability centered maintenance) to drive smart application of challenged budget
- Align future investments with mission priorities
- Alleviate most safety, health, and employee concerns

