



NAC Briefing on Real Estate and Facilities Maintenance

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Facilities Strategy

Mission

Drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of the Earth.

Strategic Objective

Objective 3.1: Attract and advance a highly skilled, competent and diverse workforce, cultivate an innovative work environment, and provide facilities, tools, and services needed to conduct NASA's missions.

Facilities Strategy

"NASA will renew and modernize its facilities to sustain its capabilities, and accommodate those capabilities in the most efficient facilities set practical."

Implementation

- Risk reduction.
- Investments in program and strategic capabilities.
- Operating cost reduction.

Today's Focus



- **Facility Footprint Reduction Goals**
- **EO 13693 Requirements (*Planning for Federal Sustainability in the Next Decade*)**
- **Facility Maintenance Management**



Demolition underway at Santa Susana



Office consolidation at JPL's (Bldg 171)

Facilities Footprint Reductions

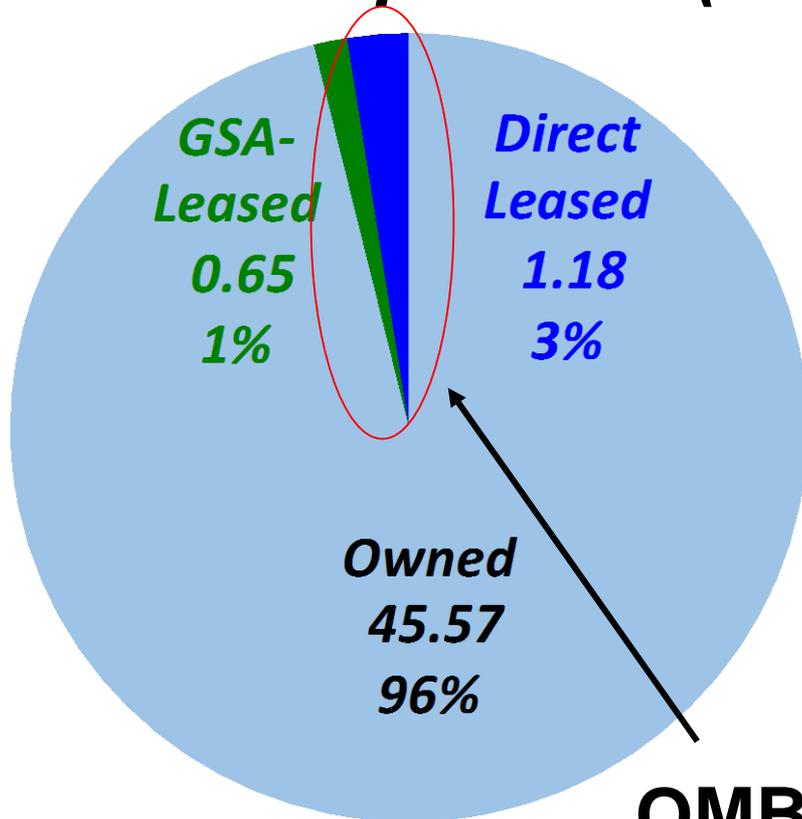


- An effective way to reduce stewardship costs is to identify the under-utilized assets and demolish facilities.
- Demolition investments reduce long term facilities sustainment, utilities and other support requirements.
- Since 2004 NASA has demolished or disposed of 1380 facilities, $\approx 22\%$ reduction by facility count.
- In March 2013 OMB issued Freeze the Footprint Policy.
- Agencies must not increase domestic administrative (office and warehouse) space from the end of FY12 baseline through FY15.
- NASA's final report submitted in April 2015 projected a 2.2% total reduction in sf by end of FY15.
- Each Center's performance toward this goal has been monitored by the Quarterly Baseline Performance Review (BPR).

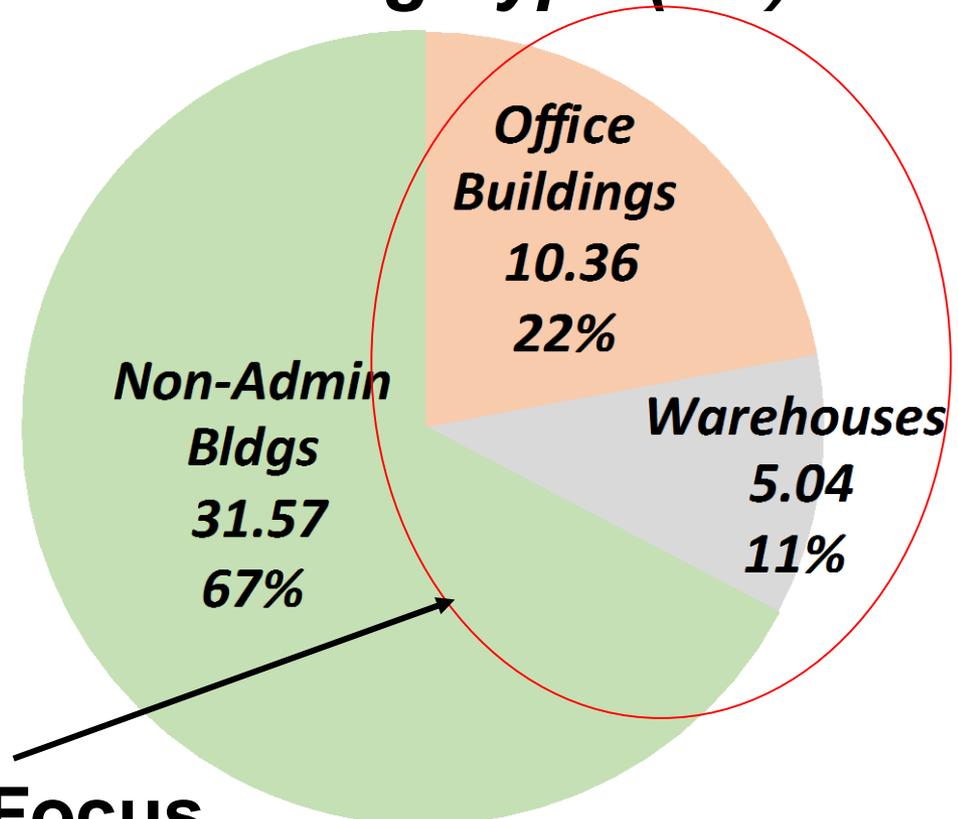


NASA's Building Portfolio

Ownership Status (SF)



Building Type (SF)



OMB Focus

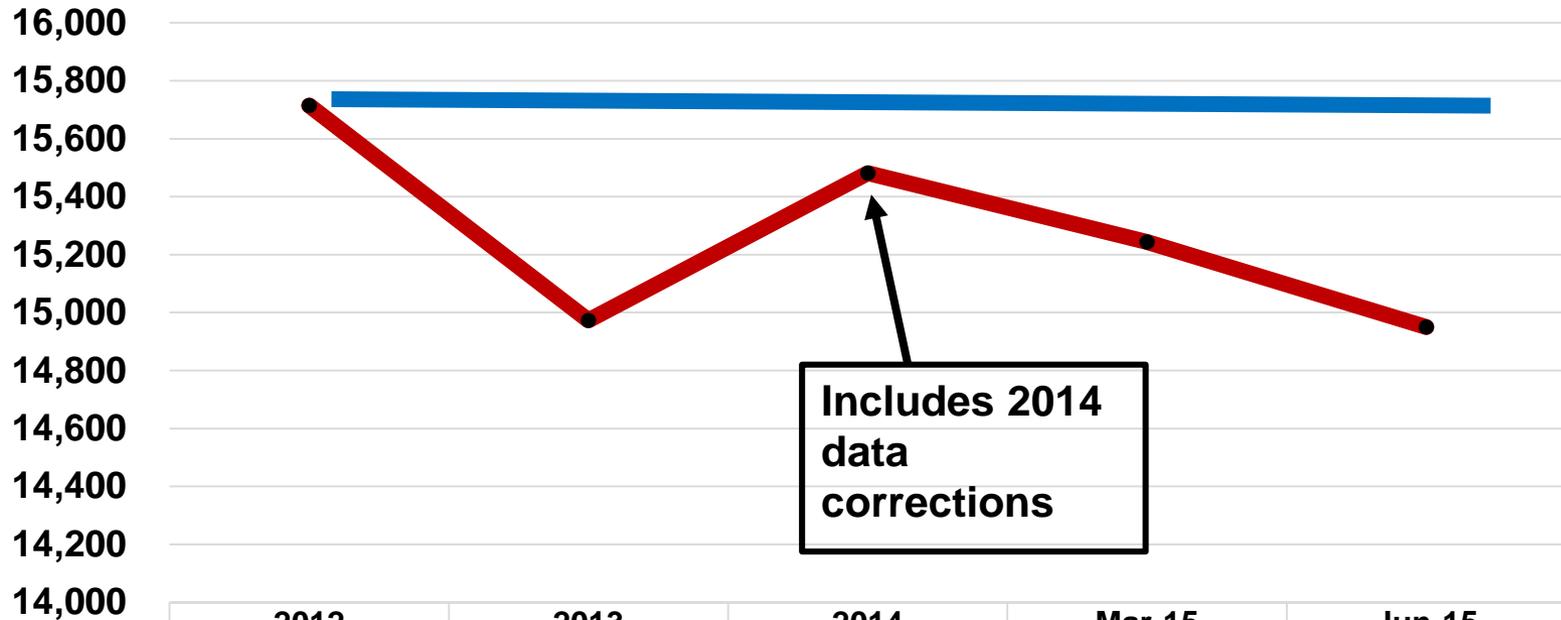
47.4 M gross square feet in FY14



Freeze the Footprint

Progress from FY12 Baseline through June 2015

Thousand Gross
Square Feet



	2012	2013	2014	Mar-15	Jun-15
● Baseline Progress	15,714,447	14,972,667	15,480,967	15,244,098	14,950,413



Reduce the Footprint (RTF) Overview

- In March 2015 OMB issued the *National Strategy for Real Property and Reduce the Footprint Policy*.
- Agencies must finalize a 5 year reduction plan (2016 – 2020) by September 10, 2015.

Requirements:

- *Baseline to be established at end of FY15.*
- *Establish reduction targets for administrative (office and warehouse) facilities.*
- *Establish reduction targets for other owned facilities.*
- *Establish a design standard for utilization of office space.*
- *No allowance for out-grants.*
 - *Commercial launch partnerships*
 - *Out leases such as the National Historic Preservation Act lease of Moffett Field with Planetary Ventures*
 - *Enhanced Use Leases*
 - *Tenants and other partnerships*

Draft Reduce the Footprint Targets (2016 – 2020)



Net Building Consolidation

Gross Square Feet (GSF)

Admin bldgs:	-510,000 GSF	-3.3%
– Office buildings:	-190,000	-1.9%
– Warehouses:	-320,000	-6.3%
<u>Non-admin bldgs:</u>	<u>-200,000</u>	<u>-0.6%</u>
Total Owned buildings:	-710,000	-1.6%

Leased buildings: No change

bldgs divested: 105 (not a net figure)

NASA Initiatives to Reduce Footprint



- Policy
 - Since 2013 NASA policy requires demolition to offset new construction (NPD 8820).
 - Mission Support Council reviews all acquisitions over \$20 million.
- Demolition
 - Funded demolition program since 2004.
 - Expect to continue funding at least \$15 million/ year.
- Site Disposals
 - 2011 White Sands Space Harbor and Palmdale Orbiter Manufacturing Facility
 - 2013 GRC North Campus and Crows Landing
 - 2014 Camp Parks
 - Santa Susana (pending)
- Reduce leased facilities
 - Since 2012 NASA has terminated 172,000 SF in leased office and warehouse space.
- Consolidation
 - Consolidation of the Atmospheric Re-entry Materials and Structures Evaluation Facilities at ARC (2013).
 - One goal of the recapitalization program is to consolidate functions and replace old facilities with new efficient facilities.



NASA Initiatives to Reduce Operating Costs

- Outgrants and Partnerships (Not included in RTF, however, still reduce operating costs).
 - KSC Multi User Spaceport provides partnerships with private companies and the State of Florida.
 - SSC Federal City offers tenant space to federal agencies to reduce operating costs and support multiple federal missions.
 - Enhanced Use Leasing has facilitated technology partnerships at ARC that support technology development, reduce NASA operating costs and generate maintenance funds from proceeds.
 - Mid-Atlantic Regional Spaceport has facilitated low cost access to space through a partnership with the Commonwealth of VA.
 - Michoud Assembly Facility (MAF) partnerships with private companies has reduced MAF operating costs.
- Energy Reduction efforts
 - 26% reduction in energy intensity (British Thermal Units (BTU) of energy consumed per square foot (sf) of building space BTU/sf) since 2003.
 - 8.9% from electricity consumed is from renewable sources.
 - 15.3% of NASA inventory is a Sustainable Green Building (by Gross Square Foot).
 - Continuing to develop cost effective projects for financing by third parties or NASA.
- Effective Facility Operations and Maintenance
 - Sufficiently resourced to meet sustainability requirements to control that rate of degradation of facilities.
 - Focus efforts to address life, safety and health issues, mission critical facilities and other quality of work considerations.



New Executive Order 13693 Requirements

Executive Order 13693: Planning for Federal Sustainability in the Next Decade, signed March, 19 2015.

Key metrics to achieve by FY 2025:

- Energy Demand Reductions **from 2015**
 - Energy Intensity (Btu/SF) **25% reduction**
- Energy Sources
 - **25% of energy consumed** is from Clean Energy sources
 - **30% of electricity** consumed is from Renewable sources

Centers will have to more aggressively pursue energy projects and enhance energy performance.

- Improve efficiency through Operations and Maintenance practices.
- Developing and executing Energy Conservation Measure Projects.
- Construct and renovate to achieve Sustainable Green Buildings.
- Develop Clean Energy and Renewable Electricity projects.

NASA's Facility Investments



- Maintenance and Repairs are addressed by Center Management & Operations (CMO) funding and program funding
 - Preventative maintenance.
 - Planned sustainment actions such as roof replacement or pavement patching.
 - Repair projects less than \$1million.
 - Unscheduled maintenance to address emergency repairs.
- Institutional CoF Funding (approx. 90%) is used for:
 - Larger repair projects, repair by replacement (includes buildings, structures and infrastructure) and risk based repair or replacement projects.
 - Demolition, high rate of return.
 - Over the past 5 years, the demolition program has reduced our Deferred Maintenance (DM) by approximately 0.5%/year.
 - New facilities construction has improved our DM by 2%/year.
 - New facilities to consolidate functions, reduce SF and move functions into Sustainable Green Buildings.

NASA's Approach to Maintenance Investments



- Condition Monitoring
 - OSI conducts Annual Deferred Maintenance (DM) assessments to ensure a consistent evaluation of the condition of each facility.
 - DM shows changes in facility condition from one year to the next.
 - With sufficient and effective sustainment investments, facility conditions will slowly degrade over time.
 - Without effective sustainment, facility degradation will accelerate.
 - Centers use the condition of facilities to inform long-term maintenance and repair plans. Sustainment actions are also prioritized based on mission criticality and other factors.
 - DM also provides an agency-wide metric for facility condition.

- Metric to monitor Center maintenance investment
 - NASA has multiple annual maintenance metrics and is now tracking quarterly unscheduled maintenance as a percentage of total maintenance.

Measuring Unscheduled Maintenance



Facilities Maintenance Metric

- Percentage of cost of unscheduled maintenance vs total maintenance cost at a Center.
- This metric is an indicator of reliability and condition because a high % indicates high failure rates. NASA considers 20% acceptable.
 - Higher percentages indicate a lack of effective preventative maintenance and sustainment.
 - Unscheduled repairs are often more expensive than the preventive measures and create risk of impacts to mission.
- Goal of 25% across agency and reducing each Center's unscheduled maintenance by 2% annually.
- Provides Agency another perspective of the effectiveness of Center's maintenance program.
- Most Centers use a Computerized Maintenance Management System (CMMS) that tracks all maintenance activities (MAXIMO).



Facilities Condition

- Because of age and condition, critical systems within NASA's infrastructure are becoming increasingly unreliable, impacting NASA's missions.
- Examples of major facilities failures.
 - Water main breakage, shut an entire Center down for 2 days.
 - Linear infrastructure breakage, caused testing delays and reimbursable revenue loss.
 - Mechanical and electrical systems failures delayed testing and affected personnel.

How Centers Meet Unscheduled Maintenance Goals



- Centers are implementing many efforts to improve the ratio of unscheduled maintenance, including:
 - Ensure preventative maintenance program is adequate.
 - Increase Conditioned Based Maintenance (CBM) efforts.
 - Perform more predictive testing and inspection.
 - Increase remote monitoring.
 - Identify “high risk” equipment.
 - Adequately fund long-term maintenance and repair program.

Maintenance Funding



Recommended funding levels for sustainment (amount needed to keep facilities in their current condition).

- 1) Baseline Service Level Study recommended 1.6% of CRV to maintain current condition. Funding levels from FY11-FY14 have been between 0.84% and 0.89% of CRV.
- 2) Center Maintenance Requirements – during the past 3 years, maintenance was funded at an average of 39% of the Center’s estimated maintenance requirement.
- 3) O&M Cost Study provided recommended funding levels for various building types. Overall, NASA funds at approximately 50% of the recommended levels.

Percent of Actual O&M funding / Recommended O&M funding levels by Building type	
<i>Building Type</i>	<i>Percent</i>
Administrative Buildings	59%
Propulsion Test Facilities	96%
Communications Buildings/Data Centers	44%
Space Science R & D Facilities	46%

Summary



- **Solid plan for reducing NASA's footprint at each Center. Execution will be monitored by OSI and during Baseline Performance Reviews.**
- **NASA will continue to be a leader in energy initiatives.**
- **Using metrics to better manage facilities maintenance and better inform facility investments.**



Questions?



Background Slides

NASA's Footprint Reduction Goals



- NASA's 2009 goals were long-term and strategic, guiding master planning targets and were not intended to be hardline metrics. Set with the expectation of a substantial ramp-up of capital investment, which did not happen.
- OMB's Freeze the Footprint (FtF) initiative tracked NASA and its Centers against an FY 2012 office and warehouse baseline measured in gross building area, which became the basis for the BPR metric.
- NASA master plans define Center consolidation opportunities in response to guidance to strive for a 10% reduction by 2020 and a 15% reduction by the 2050's, each measured against a 2009 baseline in valuation (rather than square footage) terms.

Freeze the Footprint and Reduce the Footprint Goals



- In April 2015, NASA submitted its final report on the 2012 baseline to OMB to complete the FtF initiative.
- OMB established the 2012 baseline.
- OMB will set a new 2015 baseline based on NASA's data submission to the Federal Real Property Profile at the end of the FY 2015.
- OMB is currently reviewing draft RtF targets based on NASA's 5-year Plan.
- NASA will adjust its Center master plans and RtF plan to reflect them within budget constraints. The goals may be adjusted based on the results of ongoing assessments.

Other NASA initiatives



- As described in a recent white paper on its Capability Leadership Model, NASA has adopted and is in the process of implementing the concept of portfolio management.
- The NASA Technical Capability Database was an early effort to quantify the workforce and facilities components of technical capabilities, and has been superseded by TCAT process and products, notably a more systematic structure and lexicon for categorizing capabilities.
- NASA maintains the Aeronautics Test Facilities Inventory which is a database of test facilities capabilities. This database is used by the Office of Science and Technology Policy in support of the national test facility database.