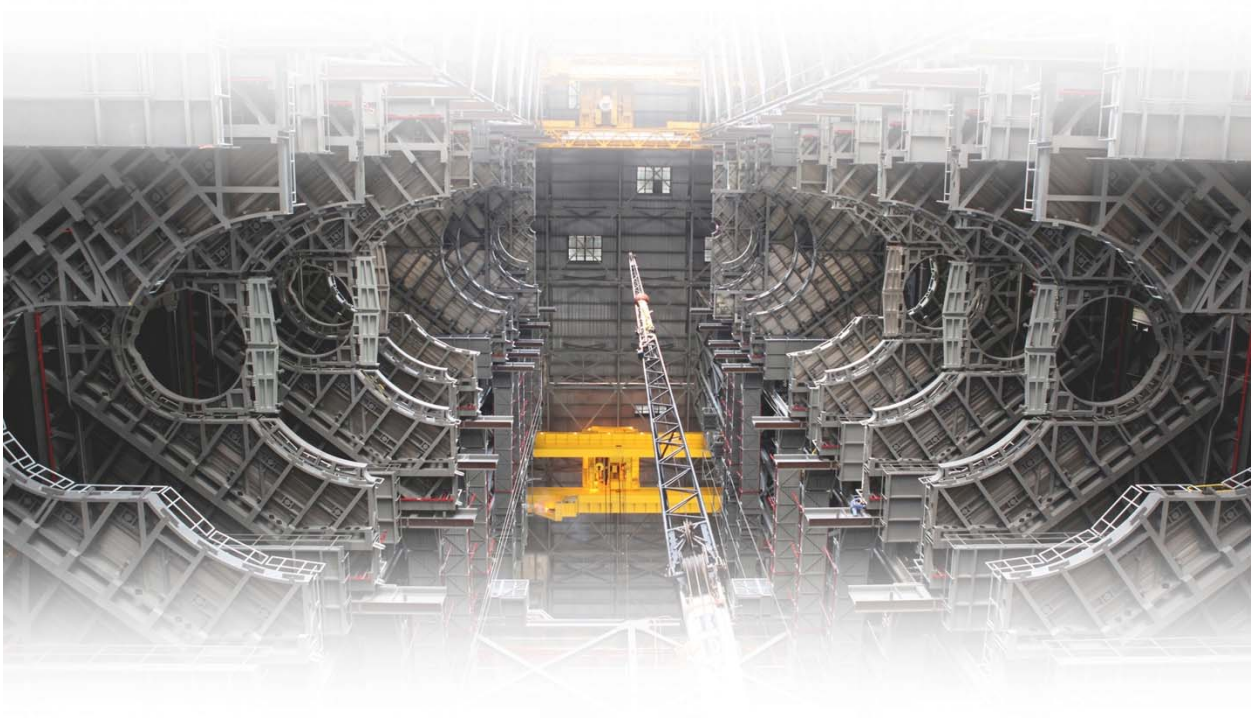
National Aeronautics and Space Administration

Section 3 Progress Report
Executive Order 13287

2015 – 2017



VAB Interior Platforms; KSC 2017

ACRONYMS

TABLES

FIGURES

ACRONYMS

ACHP	Advisory Council on Historic Preservation
ARC	Ames Research Center
ARPA	Archaeological Resources Protection Act
CCP	Commercial Crew Program
CRM	Cultural Resources Manager
CRMP	Cultural Resource Management Plan
CST	Crew Space Transportation
CxP	Constellation Program
DoD	U.S. Department of Defense
EMD	Environmental Management Division
EO	Executive Order
ESD	Exploration Systems Development
FPO	Federal Preservation Officer
GDSCC	Goldstone Deep Space Communications Complex
GIS	Geographic Information Systems
GRC	Glenn Research Center
GSA	U.S. General Services Administration
GSDO	Ground Systems Development Operations
GSFC	Goddard Space Flight Center
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HALS	Historic American Landscapes Survey
HQ	Headquarters
ICRMP	Integrated Cultural Resource Management Plan
ISS	International Space Station
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
KSC	Kennedy Space Center
LAE	Launch Abort Engine
LaRC	Langley Research Center
MAF	Michoud Assembly Facility

MOA	Memorandum of Agreement
MOCR	Mission Operations Control Room
MPCV	Multipurpose Crew Vehicle
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NCSHPO	National Conference of State Historic Preservation Officers
NEPA	National Environmental Policy Act
NETS	NASA Environmental Tracking System
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NID	NASA Interim Directive
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NPS	National Park Service
NRHP	National Register of Historic Places
NTHP	National Trust for Historic Preservation
OPF	Orbiter Processing Facility
PA	Programmatic Agreement
PBRB	Public Buildings Reform Board
PBS	Plum Brook Station
PCB	Polychlorinated Biphenyl
PV	Planetary Ventures, LLC
RPMS	Real Property Management System
SAIL	Shuttle Avionics Integration Laboratory
SATERN	System for Administration, Training, and Educational Resources for NASA
SCH	Space Center Houston
SFFAS	Statement of Federal Financial Accounting Standards
SHPO	State Historic Preservation Office
SLS	Space Launch System
SOI	Secretary of the Interior
SSC	Stennis Space Center
SSFL	Santa Susana Field Laboratory

SSP	Space Shuttle Program
SSPP	Strategic Sustainability Performance Plan
STEM	Science, Technology, Engineering, and Mathematics
TCP	Traditional Cultural Property
FWS	U.S. Fish and Wildlife Service
VAB	Vehicle Assembly Building
WFF	Wallops Flight Facility
WSTF	White Sands Test Facility

SECTION ONE INTRODUCTION

This report is submitted to the Advisory Council on Historic Preservation (ACHP) by the National Aeronautics and Space Administration (NASA) in compliance with Executive Order (EO) 13287, entitled *Preserve America*. Section 3 of EO 13287 requires NASA to submit a triennial report on its progress in identifying, protecting, and using historic properties in the Agency's ownership, as mandated by the National Historic Preservation Act of 1966, as amended (NHPA). This report is the sixth report prepared by NASA under the EO: it is preceded by a baseline report in 2004, a progress report in 2005, and triennial reports in 2008, 2011, and 2014. This report covers the three-year period from 2015 to 2017.

1.1 NASA CULTURAL RESOURCES STEWARDSHIP

In the fourteen years since the issuance of EO 13287, NASA's CRM Program has progressed from a reactive, Section 106-driven program with highly variable approaches to implementation across the Centers to a fully developed program with established procedures that enable proactive, consistent implementation Agency-wide. This is a notable culture shift for the Agency with respect to historic properties, and this shift is evident in the sequence of EO 13287 reports produced by the Agency from 2004 to now.

From its founding, NASA has always recognized the profound importance of its activities, and has readily documented important advances and events and shared that information with the public. The link between the history and the physical sites, buildings, structures, objects, and districts was incidental – the resources were not important in and of themselves but rather the activities housed therein. This is in part due to the way that resources are used by NASA: an agency dedicated to the fields of aeronautics, exploration, science, and space technology, NASA routinely modifies, upgrades, reconfigures, and replaces its resources, and therefore traditional approaches to preservation are often not feasible. NASA's management of historic properties is further complicated by the exceptional importance of many of their resources under Criteria Consideration G, rendering the 50-year benchmark less reliable in survey planning.

The challenges facing agencies like NASA were acknowledged in ACHP's 1991 publication *Balancing Historic Preservation Needs with the Operations of Highly Technical or Scientific Facilities*, prepared in response to a Congressional request seeking counsel on "how a balance could be struck between the preservation of physical reminders of the scientific legacy of the U.S. and the ongoing operation and upgrading of scientific and technical research facilities."[1] Issued on the heels of the "Man in Space" National Historic Landmark (NHL) theme study (1984) that resulted in the designation of 20 NASA NHLs, ACHP's publication recommended special consideration for these historic properties on the part of cultural resources managers and reviewers applying the NHPA as well as Agency officials and technical experts.

In the 2015 update, ACHP reinforced the need for the scientific community to "better acknowledge that it has a responsibility to future generations. It needs to think harder about its legacy and how it can be preserved

[1] An abridged version of the original 1991 publication was released by the ACHP in 2012. ACHP, "Consideration of Highly Technical and Scientific Facilities in Section 106 Review," 30 April 2012 (updated September 2015).

and conveyed, and must actively promote and encourage this preservation."

NASA has taken this to heart. Under the leadership of the Federal Preservation Officer (FPO), with support from Headquarters (HQ) Environmental Management Division (EMD) and the Center Cultural Resources Managers (Center CRMs), NASA's awareness of the importance of its cultural resources continues to grow, and with it the appreciation of the value of the physical sites, buildings, structures, objects, and districts that tell the Agency's story. NASA embraces its role to "administer federally owned, administered, or controlled historic property in a spirit of stewardship for the inspiration and benefit of present and future generations."[2] The culture shift has directly contributed to an expanded inventory of identified historic properties, and the development and implementation of policies, procedures, and practices that encourage their protection and use.

1.2 CONTINUING PROGRESS

This triennial report is organized according to the ACHP's June 2017 *Advisory Guidelines Implementing Executive Order 13287, "Preserve America" Section 3: Reporting Progress on the Identification, Protection, and Use of Federal Historic Properties*, and it specifically addresses the reporting period from 2015 to 2017. It reflects, however, strong thematic continuity with the reports that have gone before it, and reinforces the positive trajectory of NASA's CRM Program in those years. A summary of significant themes is provided below.

Identification

- A general shift from reactive, Section 106-driven identification to proactive, comprehensive Section 110 identification of historic properties.
- Expansion of NASA's inventory of historic properties due to the increasing number of resources that have reached 50 years of age.
- Identification of historic districts (Figure 1) and broader recognition of the value of Programmatic Agreements (PAs) as a tool to streamline cultural resources management under Section 106.

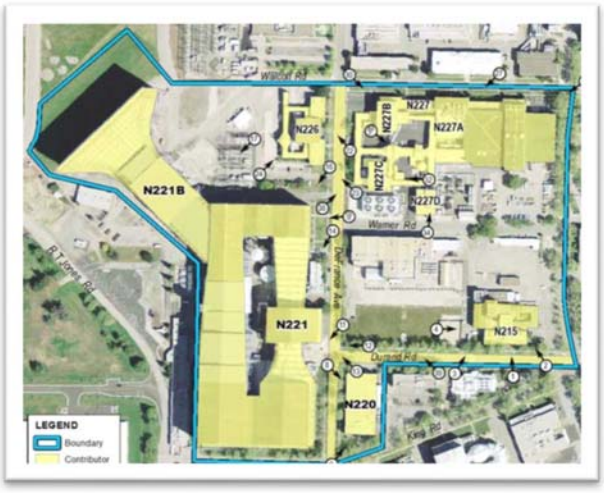


Figure 1: The ARC Wind Tunnel Historic District, listed on the National Register of Historic Places in 2015

Protection

- Standardization of CRM Program practices through the development of policies, procedures, guidance, and training.
- Increased awareness of historic properties and integration of historic property considerations into the real property management, master planning, and facilities engineering processes.
- Strengthening of relationships with Indian Tribes and proactive engagement

[2] NHPA, 54 U.S.C. § 300101.

to identify and protect archaeological resources and other sites with cultural significance to Tribal groups.

- Continued budget scrutiny and fiscal constraints that severely limit the funds that can be funneled to historic properties.
- "Reduce the Footprint," strategy for real property management disproportionately increases the pressure to demolish the oldest buildings in the Agency's inventory.

Use

- Emphasis on the cost-effective use of historic properties as the best way to ensure their preservation.
- Modification and upgrade to historic properties as Agency missions evolve and transition (Figure 2).
- Encouraging Section 111 leases and other use partnerships to distribute the burden of operational and maintenance costs for historic properties, and to enable public access to and appreciation of NASA's unique resources.
- Limitations to reuse of historic properties by non-government entities because of their highly specialized nature and limited access due to security restrictions.
- Creative mitigation for demolished historic properties that utilizes technology to maximize public exposure and engagement.

As indicated above, while NASA's CRM Program matures and the Agency embraces its stewardship role, it continues to struggle under the same challenges that it has in the past – budget limitations and the pressure to demolish older buildings in response to changing mission needs, new technology, and sustainability goals. These factors are likely to continue to impact federal agency historic preservation programs in the coming years.

Figure 2: The Orion Multi-Purpose Crew Vehicle (MPCV), after a test launch in 2014. Originally developed as part of the Constellation Program, the vehicle has been modified for the Space Launch System (SLS) Program.

SECTION TWO NASA'S CRM PROGRAM

2.1 NASA CENTERS

Agency operations are implemented across 16 NASA Centers and component facilities (collectively referred to as Centers in this report) that range greatly in acreage (175 acres to 140,000 acres, Table 1, Figure 3).

Table 1: NASA Centers

No.	Acronym	Name	Location	Est.	Acreage	No. Built Assets
1	AFRC	Armstrong Flight Research Center*	California	1954	1,145	215
2	ARC	Ames Research Center	California	1940	1,874	400
3	GDSCC	Goldstone Deep Space Communication Complex**	California	1958	28,170	131
4	GRC	Glenn Research Center	Ohio	1940	307	202
5	GSFC	Goddard Space Flight Center	Maryland	1959	1,300	507
6	JPL	Jet Propulsion Laboratory	California	1958	175	204
7	JSC/ELF	Johnson Space Center/Ellington Field	Texas	1962	1,720	399
8	KSC	Kennedy Space Center	Florida	1958	140,000	901
9	LaRC	Langley Research Center	Virginia	1917	788	313
10	MAF	Michoud Assembly Facility	Louisiana	1964	832	171
11	MSFC	Marshall Space Flight Center	Alabama	1960	1,841	322
12	GRC-PBS	Glenn Research Center – Plum Brook Station***	Ohio	1956	6,450	166
13	SSC	Stennis Space Center	Mississippi	1962	13,248	403
14	SSFL	Santa Susana Field Laboratory****	California	1975	451	87
15	WFF	Wallops Flight Facility	Virginia	1959	6,500	553
16	WSTF	White Sands Test Facility	New Mexico	1963	58,560	211
				TOTALS	263,361	5,185

*Formerly Dryden Flight Research Center.
** A component facility of JPL.
*** A component facility of GRC
**** A component facility of MSFC.

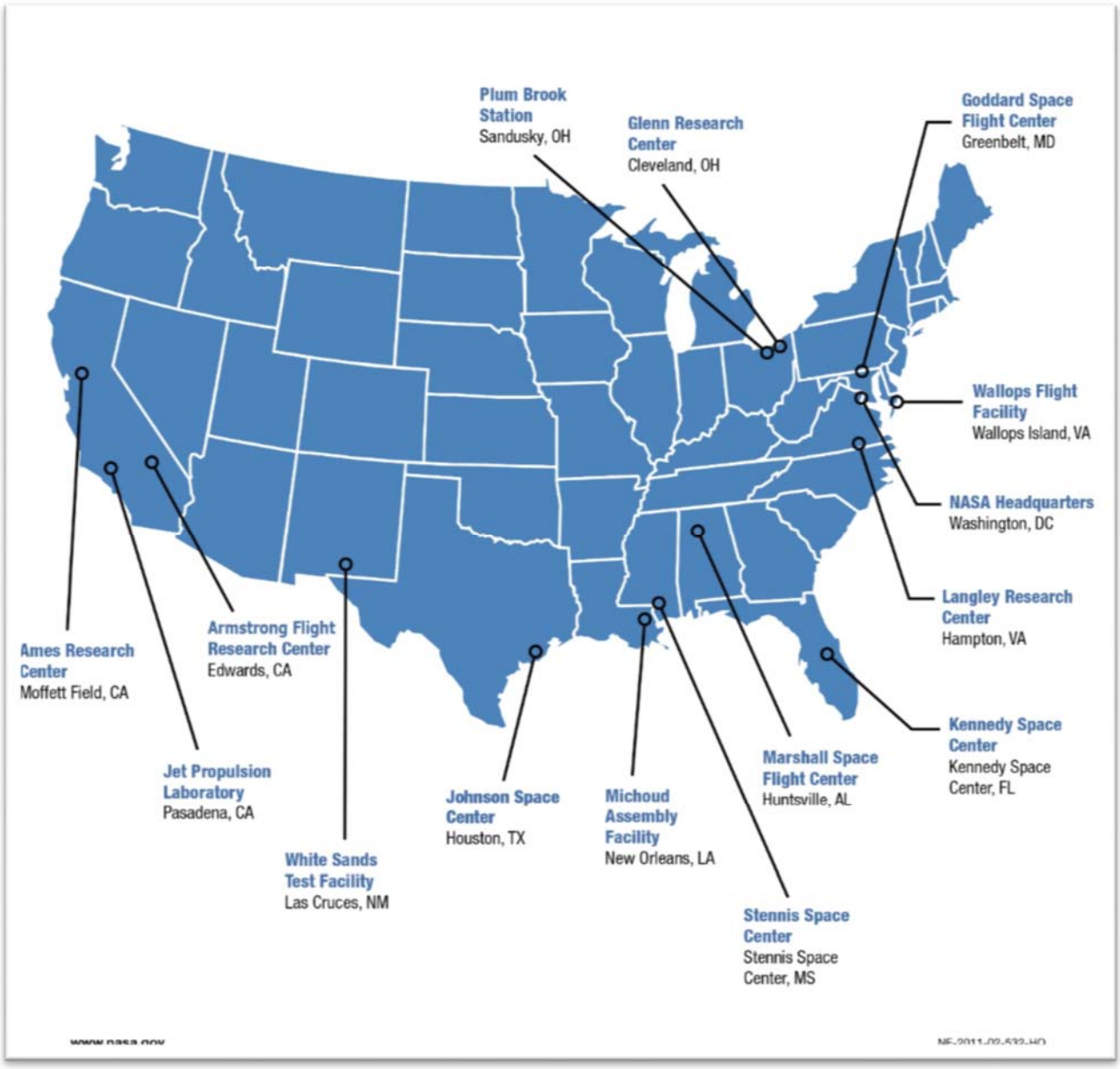


Figure 3: Map of NASA Centers (Credit: NASA)

2.2 NASA CRM PROGRAM

Based in EMD at NASA HQ, the NASA FPO is a fully-dedicated subject matter expert and policy-maker who liaises between HQ and the Center CRMs, drawing from insights gained through coordination with the ACHP and other agency FPOs. Policies and procedures developed at the HQ level are carried out by the Center CRMs, who are the face of the CRM Program at the Centers, where most of the responsibility for compliance with the NHPA lies. As NASA's CRM Program has matured under EO 13287,

the Center CRMs have jelled into a cohesive, well-trained group skilled at addressing the needs of their particular Center while responding to the concerns of the respective State Historic Preservation Offices (SHPOs), Indian Tribes, and consulting parties. The development of the Agency's cultural resources program has benefitted from the long tenure of many of the Center CRMs, who have retained institutional knowledge and shared insights gained from their years of real-world experience.

In 2012, NASA first formalized its CRM Program policies in NASA Procedural Requirement (NPR) 8510.1A, *Cultural Resources Management*. Now in its second revision, the NPR implements the applicable requirements for NASA's CRM Program under NASA Policy Directive (NPD) 8500.1, *NASA Environmental Management*, and affirms the Agency's commitment to "be a steward of cultural resources… [ensuring] preservation of their significance to NASA's mission, communities, and the history of our Nation." The NPR specifies the responsibilities of personnel with a role in the stewardship of historic properties, including:

- Assistant Administrator for the Office of Strategic Infrastructure (also the Senior Policy Official);
- Agency CRM Program Manager (also the FPO);
- HQ Facilities and Real Estate Division;
- Mission Program and/or Project Managers;
- Office of General Counsel;
- Center Directors;
- Center CRMs (formerly Historic Preservation Officers);
- Center Construction of Facilities Program Managers;
- Center Project Managers;
- Center National Environmental Policy Act (NEPA) Managers;
- Center Geographic Information Systems (GIS) Managers;
- Center Chief Counsel;
- Center Master Planner;
- Center Real Property Accountable Officer; and
- Center Property Disposal Officer.

This list illustrates the development of the CRM Program in that it recognizes the many departments and personnel involved in identifying, protecting, and using historic properties, from senior leadership at HQ, whose decisions affect large numbers of resources Agency-wide, to the individuals managing specific projects that may only affect a single resource. The list also demonstrates NASA's understanding of the need to integrate consideration of historic properties early into the facility planning process to enable positive preservation outcomes.

The NPR for the CRM Program addresses Agency responsibilities beyond NHPA compliance, including treatment of archaeological resources, Tribal consultation, coordination with NEPA, professional qualifications and training, inventory and records management, and NASA artifacts and heritage assets – categories of resources separate from but overlapping with historic properties as identified in the NHPA.

In addition to the NPR, other key procedural documents and databases utilized in the implementation of the CRM Program include:

- NASA Interim Directives (NIDs), which provide direction on a temporary basis

until permanent policy and procedures are developed and finalized;

- Center-specific Integrated Cultural Resource Management Plans (ICRMPs), PAs, and Memoranda of Agreement (MOAs); and
- The NASA Environmental Tracking System (NETS), a database in which the Agency's historic property inventory and cultural resources correspondence, agreements, reports, and activities are recorded.

Formal direction is supplemented by guidance in the form of such reference materials as *Guidance for Implementation of NASA Cultural Resources Management Requirements as Defined in NASA Procedural Requirements 8510.1A* (2012) and *NASA Desk Reference on NEPA and NHPA Coordination* (2015), numerous reference pamphlets, and face-to-face training and information exchange in annual CRM meetings.

SECTION THREE IDENTIFYING HISTORIC PROPERTIES

3.1 QUESTION 1

Building upon previous Section 3 reports, how many historic properties have been identified by your agency in the past three years? Have your identification methods improved? Approximately what percentage or portion of inventory has been surveyed and evaluated for the National Register of Historic Places (NRHP)?

A current estimate of NASA's total inventory of historic properties is provided in Table 2.

Real Property

Currently, NASA's inventory of real property stands at 5,185 built assets in the U.S.[3] Among the 5,185 assets, approximately 2,650 are classified as buildings. The remaining real property assets include fixed and movable structures and a small number of objects.

While identification in previous reporting periods was primarily the product of selective surveys conducted for the sunsetting of the Space Shuttle Program (SSP), in recent years NASA has shifted its approach to comprehensive, gate-to-gate surveys of resources over 45 years of age. This approach has enabled a more holistic evaluation of NASA's resources under a full range of potentially significant contexts, as well as the identification of new historic districts. Three Centers – GRC, JPL, and JSC – updated their inventories during this reporting period with gate-to-gate Section 110 surveys of built assets over 45 years old, and four Centers – ARC, GRC, JPL, and JSC – identified new historic districts.

Table 3 shows the number of built historic properties newly identified at the Centers during the reporting period. Table 4 provides a summary of historic districts at the Centers, including those identified during the reporting period.

Review of NETS and NASA's Real Property Management System (RPMS) indicates that approximately 81% of NASA's built assets over 50 years of age have been evaluated for NRHP eligibility, with approximately 30% of evaluated resources found to be NRHP eligible (Table 5). It should be noted that the majority of the unevaluated built assets over 50 years of age are those generally considered to have a low potential to be NRHP eligible, such as utility lines, sewer features, light fixtures, street furniture, pump houses, storage sheds, and other highly utilitarian resources.

No archaeological historic properties were identified during the reporting period.

Personal Property

NASA defines personal property as "property of any kind, including equipment, materials, and supplies, but excluding real property and certain naval vessels."[4] As noted in previous EO 13287 reports, NASA has a large inventory of personal property and artifacts that have in the past presented significant challenges with respect to the identification of historic properties. Only a very small percentage of NASA's personal property has the potential to be individually eligible for listing in the NRHP, or as a contributing resource to an associated NRHP-eligible building. However, NASA has made

[3] NASA owns an additional 153 built assets in Canberra, Australia and Madrid, Spain. These resources are not addressed in this report.

[4] NPR 8510.1A, *NASA Cultural Resources Management*, Appendix A (Definitions).

significant progress during the reporting period in addressing these challenges. In particular, NASA's NPRs for CRM, personal property disposal (NPR 4300.001C), and artifact identification and disposition (NPR 4310.001A) all now include the requirement for Center CRMs to be consulted prior to disposition. The NPR for CRM further states that "efforts to identify, evaluate, and treat historic properties shall consider personal property, either individually or as a contributing element to a property" (Section 2.2.2).

Heritage Assets

The Statement of Federal Financial Accounting Standards (SFFAS) 29 on heritage assets and stewardship land defines a heritage asset as "property, plant, or equipment that is unique for its historical or natural significance; cultural, educational, or artistic (e.g. aesthetic) importance; and/or significant architectural characteristics… [consisting of] (1) collection types, such as objects gathered and maintained for exhibition (for example, museum collections, art collections, and library collections); or (2) non-collection-types, such as parks, memorials, monuments, and buildings." In the NPR for CRM, NASA defines all real property that is NRHP-eligible as a heritage asset. Reports on heritage assets are prepared by the Chief Financial Officer, in consultation with the FPO.

Table 2: Total Number of Identified Historic Properties

Center	Built Resources					Archaeological Resources*
	Eligible, District	Eligible, Contributing*	Eligible, Individually*	NRHP Listed	NHL	
AFRC	1	5	1	0	0	0
ARC	2	30	19	34	1	0
GDSCC	0	0	1	0	1	15
GRC	1	89	3	1	1	0
GSFC	1	30	0	0	1	0
JPL	1	29	8	0	2	0
JSC/ELF	1	46	53	0	1	0
KSC	7	64	45	49	2	56
LaRC	1	165	22	115	2	12
MAF	0	0	6	0	0	0
MSFC	0	0	34	0	5	14
GRC-PBS	0	0	3	0	5	3
SSC	0	0	1	0	4	2
SSFL	3	36	9	0	0	44
WFF	0	0	2	0	0	2
WSTF	2	24	3	0	0	90
TOTALS	20	518	210	199	25	238

*Includes resources determined potentially eligible or awaiting concurrence.

Table 3: Built Historic Properties Newly Identified During the Reporting Period (2015-2017)

Center	Eligible, District	Eligible, Contributing to District	Eligible, Individually
AFRC	0	0	0
ARC	1	5	0
GDSCC	0	0	0
GRC	1	89	3
GSFC	0	0	0
JPL	1	29	0
JSC/ELF	1	46	36
KSC	0	0	0
LaRC	0	0	0
MAF	0	0	0
MSFC	0	0	0
GRC-PBS	0	0	0
SSC	0	0	0
SSFL	0	0	0
WFF	0	0	0
WSTF	0	0	0
TOTALS	4	169	39

Table 4: NASA Historic Districts

Center	Total No.	Identified 2015-2017
AFRC	1	0
ARC	2	1
GDSCC	0	0
GRC	1	1
GSFC	1	0
JPL	1	1
JSC/ELF	1	1
KSC	7	0
LaRC	1	0
MAF	0	0
MSFC	0	0
GRC-PBS	0	0
SSC	0	0
SSFL	3	0
WFF	0	0
WSTF	2	0
TOTALS	20	4

Table 5: NRHP Evaluation Status of Built Assets Constructed In or Prior to 1967

Center	Total No.	No. Evaluated	Percent Evaluated	NRHP Eligible*	Percent of Evaluated Resources Determined NRHP Eligible
AFRC	53	39	74%	3	8%
ARC	225	146	65%	43	29%
GDSCC	42	30	71%	11	37%
GRC	119	116	97%	60	52%
GSFC	89	59	66%	30	51%
JPL	101	87	86%	30	34%
JSC/ELF	161	160	99%	75	47%
KSC	198	147	74%	54	37%
LaRC	114	96	84%	82	85%
MAF	99	99	100%	3	3%
MSFC	162	151	93%	27	18%
GRC-PBS	121	121	100%	1	1%
SSC	64	62	97%	4	6%
SSFL	74	33	45%	25	76%
WFF	220	142	65%	1	1%
WSTF	80	73	91%	27	37%
TOTALS	1922	1561	81%	476	30%

*Includes findings awaiting SHPO concurrence.

3.2 QUESTION 2

Does your agency have policies that promote awareness and identification of historic properties?

Yes. NASA has policies, procedures, guidance, training, and best practices that promote awareness and identification of historic properties.

NPR 8510.1A, *NASA Cultural Resources Management*

Updated in 2017, the NPR for CRM is the principal policy document governing NASA's CRM Program. It presents the authorities and responsibilities of the Agency with respect to the NHPA and other cultural resources laws (e.g., the Archaeological Resources Protection Act [ARPA]), and ascribes specific responsibilities to personnel within the Agency.

The NPR for CRM designates the Center CRMs as responsible for implementing NASA CRM Program activities in compliance with Sections 106 and 110 of the NHPA, including the identification by qualified personnel of historic properties owned or controlled by NASA through survey and evaluation.

The document also reflects NASA's understanding that successful management and protection of historic properties – known and potential – requires consideration by numerous parties early in the planning process, well in advance of any physical activities. Accordingly, at the Center level personnel engaged in real property management, master planning, mission planning, construction, maintenance, and GIS are ascribed responsibilities to proactively communicate with the Center CRMs so that historic properties can be fully and effectively considered.

The NPR acknowledges the leadership role that the Center Director plays with respect to the CRM Program in fostering through words and behavior an environment that promotes awareness of and respect for NASA's historic properties and other cultural resources. The Center Director is responsible for ensuring compliance with applicable laws, including the NHPA, and for seeing that the appropriate funding is available for historic property identification and other CRM Program activities. As the most senior person at the Center, the Center Director is charged with establishing "a process for integrating CRM into Center master and mission planning that includes early coordination with other programs, tenants, and projects, and integration of the Center ICRMP into other Center planning documents."

As detailed in the NPR, the role of HQ-level personnel, including the FPO and the Facilities and Real Estate Division, is primarily to provide oversight and support to the Centers. However, as project proponents, Mission Program and Project Managers are required to coordinate with the FPO and/or Center CRMs as appropriate so that potential cultural resources impacts can be considered.

Awareness and identification of historic properties is reinforced through cross-referencing in other NPRs, including:

- NPR 4300.1C *NASA Personal Property Disposal Procedural Requirements*;
- NPR 4310.1A *Artifact Identification and Disposition*;
- NPR 8800.15C *Real Estate Management Program*;
- NPR 8810.1A *Center Master Planning*; and

- NPR 8820.2G *Facility Project Requirements*.

Center ICRMPs

As indicated in the NPR for CRM, all NASA Centers are required to have in place an ICRMP that "serves as a guide to the Center's CRM Program and outlines the Center's cultural resources management practices and procedures pursuant to Section 110 of the NHPA for historic properties." The ICRMP is to be developed in coordination with the Center's other significant planning documents including master plans, environmental management systems, and asset management plans. Currently, all but one of NASAs Centers have ICRMPs in place or in draft form.

CRM Guidance and Training

NASA's FPOs and Center CRMs have developed a number of guidance documents for distribution among staff with a role in the stewardship of historic properties. Examples from HQ include:

- *Guidance for Implementation of NASA Cultural Resources Management Requirements as Defined in NASA Procedural Requirements 8510.1A* (2012);
- *NASA Desk Reference on NEPA and NHPA Coordination* (2015);
- Pockets Guide series, including "Section 106," "Regulatory Trace," "Avoid, Minimize, Mitigate," and "HABS/HAER/HALS";
- White papers on Criteria Consideration G, personal property and the NHPA, historic districts, and Section 106 agreement documents; and
- Online training modules for Center CRMs and other NASA staff.

Examples of CRM Guidance and Training initiated at the Centers include:

- Kennedy Space Center (KSC) Historic Properties Guide (2017, Appendix);
- Photo Tour of Goddard Space Flight Center (GSFC) (2015);
- Langley Research Center (LaRC) annual training on NEPA and CRM to non-environmental personnel; and
- GRC Historic District Documentary.

CRM guidance is also provided during annual CRM meetings, where NASA's FPO and Center CRMs come together for face-to-face training sessions and information exchange. Additionally, the FPO periodically visits the Centers to provide CRM training at facilities and real estate meetings to enhance understanding of how CRM fits into these processes and to make those Communities of Practice aware of their CRM responsibilities.

Interoffice Communication

Center CRMs meet regularly with personnel in departments that deal most often with historic properties, including real property, master planning, facilities and maintenance, and NEPA staff. Maintaining an active personal relationship with individuals in these key departments maintains awareness of historic properties and other cultural resources, enables advance planning, and decreases the likelihood that historic properties will be affected without proper consideration. Inter-departmental communications are further enhanced in cases when the Center CRM serves a dual role in CRM and another area, such as real property. Some CRMs are physically located in offices with planning, real property, and/or facilities management functions.

3.3 QUESTION 3

Describe reporting mechanisms or programs your agency uses to manage information about historic properties. What information do they contain about your historic properties?

NASA recognizes that the best way to protect historic properties is to identify them prior to activities that have the potential to affect them. Accordingly, personnel across numerous departments must have ready access to the evaluation status of resources so that they can account for known historic properties in their planning and consider whether additional investigations are needed. NASA's three primary asset tracking databases – NETS, RPMS, and Institutional GIS – are fully integrated, ensuring wider access and visibility, and Agency-wide consistency and standardization of data. A major improvement made during the reporting period was the increase in the frequency of data synchronization from twice a year to every day, ensuring that the information on historic properties is consistently accurate and up to date.

NETS

Since 2010, the NETS database has been the primary vehicle for data management, internal and external reporting, and recordkeeping for the CRM Program. It includes a comprehensive list of all buildings, structures, sites, and objects – both built and archaeological – within NASA's inventory by Center, with the date of construction, resource name, historic status (i.e., NRHP evaluation), and the date of SHPO concurrence (Figure 4)

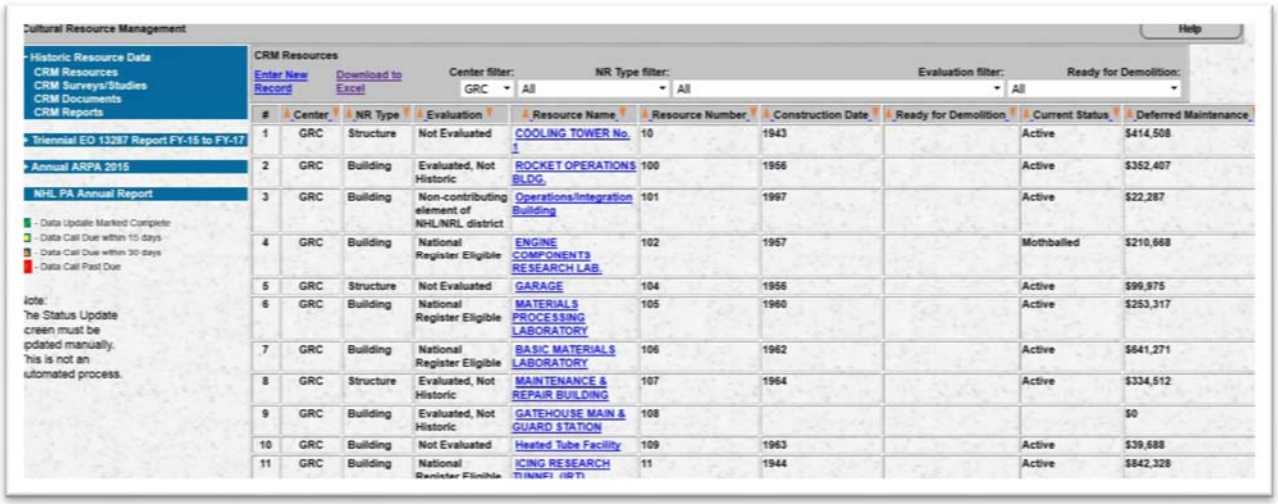


Figure 4: Screenshot of the NETS CRM Resources page (Credit: NASA)

When resources are evaluated for listing in the NRHP, the results are entered into NETS by the Center CRMs. The historic status of resources is then imported to the RPMS and Institutional GIS on a daily basis.

NETS may also be used to upload and store cultural resources surveys, agreement documents, consultation documentation, planning documents (e.g., ICRMPs), and other related records that can then be viewed by the other Centers and by NASA HQ. This document-sharing ability facilitates the

transfer of knowledge among the NASA CRM community.

NETS' final key feature is in internal and external reporting. The data stored in NETS can be used to generate reports to aid in the management of NASAs resources. NETS also allows NASA HQ to issue and manage data calls to the Centers to assist in meeting reporting requirements on a number of cultural resources topics, including property inventories and status, archaeological surveys, consultation results, and heritage tourism activities.

Significant strides have been made during this reporting period to improve the accuracy of the data, consistency of reporting, and organization of the repository. This is an ongoing task.

RPMS

In addition to NETS, NASA Center CRMs coordinate with personnel maintaining the NASA Real Property Management System (RPMS), a database routinely consulted by real property managers, master planners, project managers, facilities and maintenance staff. The results of NRHP evaluations are exported from NETS on a regular basis so that the historic status (i.e., NRHP eligible, NRHP ineligible, not evaluated) of real property assets is available to all personnel involved in the management of NASAs infrastructure.

Institutional GIS

In addition to NETS and RPMS, NASA Centers maintain GIS information on built historic properties and other cultural resources for internal reference. For security reasons and consistent with the requirements of the NHPA, NASA GIS information on historic properties is safeguarded from public distribution. The importance of this measure was reinforced during the reporting period by the addition of a provision in the CRM NPR that requires coordination with the Center CRM prior to the release of sensitive cultural resources location, character, or ownership data.

3.4 QUESTION 4

Has your agency employed partnerships to assist in the identification and evaluation of historic properties?

Yes. NASA has partnerships in place and actively seeks to develop new partnerships with government and private entities to identify historic properties.

Tribal Consultation

Consultation with Indian Tribes to identify historic properties and other cultural resources of interest to the Tribes has been a priority for NASA during the reporting period. In the past three years, several NASA Centers have initiated formal government-to-government relations with Indian Tribes with the goal of familiarizing Tribes with the Center, NASA's programs, and the kinds of activities that may affect cultural resources of significance to the Tribes. NASA's government-to-government protocols include inviting Indian Tribes to consult on future undertakings, and to obtain their approval for delegation of basic communications to the Center CRMs. As part of this relationship-building, Tribal representatives have been invited to view archaeological surveys and collections. To date, 54% of NASA Centers have initiated formal government-to-government consultation with Indian Tribes for the purpose of developing protocols for future consultation.

Tribal consultation continues to be a high-priority consideration at SSFL, where Native American archaeological sites and resources have been known to be present from the

beginning of NASA's presence on the land. Indian Tribes are key stakeholders at SSFL, where their active engagement has resulted in the identification of both a Traditional Cultural Property (TCP) and a sacred site. Because of the cultural sensitivity of the land within the boundaries of SSFL, Tribal representatives monitor all construction activities at the site to ensure that culturally significant resources are not adversely affected by NASA's activities.

During the reporting period, in 2016, the Pamunkey Indian Tribe became the first Indian Tribe to receive federal recognition in Virginia, where two NASA Centers – LaRC and WFF – are located. Following the announcement, Center personnel reached out to Tribal representatives to invite them to participate in future consultations at the Virginia Centers. NASA continues to develop that relationship.

Partnerships at KSC

At approximately 140,000 largely undeveloped acres, KSC is NASA's largest Center. With so much open land to monitor, KSC has entered into a partnership with the U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS) to manage archaeological resources in the northern portion of the Center, which includes portions of the Merritt Island National Wildlife Refuge and the Canaveral National Seashore. In this area NPS has the responsibility to research, interpret and protect archaeological resources, including the curation of artifacts at the NPS's Southeast Archeological Center. Projects with the potential to affect archaeological resources within the areas managed by FWS and/or the NPS are reviewed by KSC's Center CRM prior to ground-disturbing activity to ensure that adverse effects are avoided.

3.5 QUESTION 5

Provide specific examples of major challenges, successes, and/or opportunities your agency has experienced in identifying historic properties over the past three years.

Successes

Among NASA's successes in identifying historic properties during the reporting period is the continuing trajectory from reactive identification towards holistic Section 110 gate-to-gate surveys at NASA Centers. This approach has enabled the identification of new historic districts at GRC, JPL, and JSC, and has provided NASA with more comprehensive data on their inventory of historic properties so that cumulative impacts may be more effectively evaluated in both the NEPA and NHPA processes.

NASA also takes pride in the development of strengthened relationships with Indian Tribes. NASA Centers have a greater awareness of and respect for the value that Tribes bring to the identification of culturally significant resources, many of which are not recognizable to the lay person.

Challenges

NASA has made significant strides in the area of historic property identification during the reporting period. As shown in Table 5, 81% of its built assets over 50 years of age have been evaluated for NRHP eligibility. This is particularly noteworthy given that NASA's portfolio of built assets over 50 years of age has sharply risen in the past 10 years from approximately 15% of its total portfolio in 2007 to 40% in 2017 (Figure 5). This trend is a reflection of NASA's establishment in 1958 and subsequent rapid build-up during its first ten years.

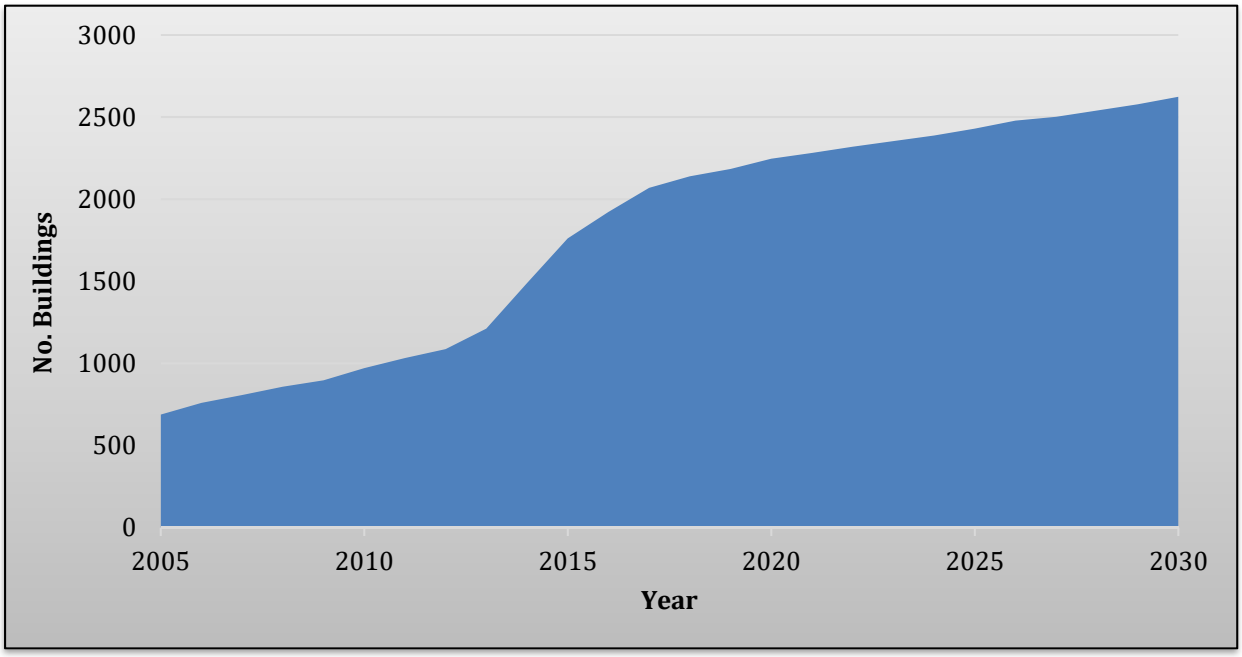


Figure 5: NASA Built Assets over 50 Years of Age by Year (Credit: NASA)

The increase in the number of resources over 50 years of age and the cost of large-scale survey are deterrents to NASA completing its identification efforts in coming years. Unlike federal agencies like the Department of Defense (DoD) and the General Services Administration (GSA), NASA does not employ enough professionally qualified cultural resources personnel to complete large-scale surveys internally. The current climate of federal budgetary restrictions and the move towards commercialization of space exploration means that NASA has less discretionary funding to redirect from mission-critical programs. This can result in the deferral of Section 110 identification and reliance on Section 106 identification, since the latter is required to carry out the physical improvements necessary to advance a project, which is directly attributable to the mission. NASA's FPO and Center CRMs will, however, continue to advocate for Section 110 identification when opportunities arise.

NASA also continues to be challenged by its large inventory of personal property, which is managed outside of the CRM program. Only a small portion of the personal property inventory is likely to be eligible for listing on the NRHP. Controls have been put in place – and strengthened during this reporting period with added requirements to involve Center CRMs – for the identification and appropriate management of any NRHP-eligible items. However, it will take some time and training for these processes to become internalized and consistent.

SECTION FOUR PROTECTING HISTORIC PROPERTIES

4.1 QUESTION 6

Have your agency's programs and procedures to protect historic properties, including compliance with Sections 106, 110, and 111 of the NHPA, changed over the past three years in ways that benefit historic properties?

Yes. Identification and awareness of historic properties throughout the Agency is the first step to protection. As indicated in Section Three, NASA continues to develop its approaches to identification in several areas, enabling more effective management of historic properties. Additionally, NASA has made measurable improvement during the reporting period in four major areas that contribute to the Agency's ability to protect historic properties: use of Section 106 PAs; commitment to Tribal consultation; emphasis on CRM qualifications and training; and improved regulatory compliance through policy implementation.

Table 6: NASA Section 106 Programmatic Agreements

Center	No.	Status	Scope
Agency-wide	1	Executed	NHLs
AFRC	0	N/A	N/A
ARC	1	In development	Center-wide
GDSCC	0	N/A	N/A
GRC	1	In development	Center-wide
GSFC	0	N/A	N/A
JPL	0	N/A	N/A
JSC/ELF	1	In development	Center-wide
	1	Executed	Space Shuttle Assets
KSC	1	Executed; Revision underway	Center-wide
LaRC	1	Executed	Center-wide
MAF	0	N/A	N/A
MSFC	1	Executed	Center-wide
GRC-PBS	1	Executed	Center-wide
SSC	0	N/A	N/A
SSFL	1	Executed	Center-wide
WFF	1	Executed	Center-wide
WSTF	1	In development	Center-wide

Programmatic Agreements

NASA's efforts to conduct proactive, inclusive surveys, including gate-to-gate surveys and identification of historic districts, enables a more comprehensive understanding of historic properties so that cumulative effects can be more thoroughly assessed. It also lays the foundation for the structuring and implementation of Center-specific PAs that integrate protection of historic properties into the regular operations of the Centers. Centers are encouraged to include provisions in their PAs for actions that can be taken to avoid adverse effects to historic properties, such as archaeological monitoring and adherence to the Secretary of the Interior's guidelines when modifying historic buildings. Table 6 lists the status of NASA PAs by Center as of the submission of this report.

Tribal Consultation

The emphasis that NASA has placed during the reporting period on active and regular engagement of Indian Tribes enhances NASAs ability to protect those specific resources that are significant to Tribes. Tribal participation in identification of cultural resources is critical, but so too is their participation in the protection of culturally sensitive resources.

Figure 6: Native American participants at Burro Flats, SSFL for summer solstice event, December 2016 (Credit: Devlin Grandy)

Tribal groups view cultural resources in very different ways from traditional Western society: their significance, boundaries, and character-defining features may not be recognizable to someone outside the Tribe, and thus require Tribal input to identify, as do the kinds of activities that may affect them. NASA intends to rely on regular

government-to-government consultation with Indian Tribes as an essential element in protecting Tribal cultural resources.

CRM Qualifications and Training

Protection of historic properties requires that personnel charged with their management understand the basic framework for CRM. In the past, NASA CRM positions, including the FPO, were commonly held by professionals from other technical backgrounds, such as real property or NEPA compliance, with CRM responsibilities assigned on top of their primary duties. In recent years NASA has placed personnel meeting the Secretary of the Interior's (SOI) Professional Qualification Standards in the role of FPO, but currently none of the Center CRMs, many of whom have served in the position for years, are SOI-qualified. Accordingly, NASA has prioritized the need for CRM training. The CRM NPR requires that Center CRMs either meet the SOI Professional Qualification Standards or receive baseline CRM training within six months of their assignment (Section 2.6.1). During the reporting period an additional requirement was added for Center CRMs to take a least one training course every year. To support that requirement without the need for travel, NASA is developing online training modules to be delivered through the System for Administration, Training, and Educational Resources for NASA (SATERN). Modules currently in development include general and advanced Section 106, Tribal consultation, treatment of historic properties, writing Section 106 agreement documents, and working with historic districts. Scheduled for delivery in December 2017, the training modules will be directed towards a range of skill levels: introductory modules will be intended for first-time CRMs and other Agency personnel who need or want to learn about the basics of the CRM Program; while intermediate and advanced modules will be designed to enhance the knowledge of more experienced individuals.

Professional and online training is supplemented by the annual CRM meetings. NASA's FPO and Center CRMs come together for several days at one of Centers for training and sharing sessions focused towards real-world needs and experiences in historic preservation and cultural resources management specific to NASA. These meetings serve as NASA's primary forum for CRMs to come together and exchange ideas, receive critical training and continuing education, and briefings on national policy updates. During the 2017 annual CRM meeting, for example, NASA invited a guest from GSA to speak on the topic of renovating historic buildings to address sustainability and energy efficiency goals without a loss of integrity. This approach is being promoted by NASA as more cost-effective and sustainable alternative to wholesale demolition of old buildings and replacement with new construction.

Improvements in Regulatory Compliance Through Policy Implementation

NASA continues to make strides in ensuring compliance with federal laws and regulations to protect significant cultural resources by codifying implementation processes into formal policy. Three notable examples from this reporting period are provided below.

- Revision of the CRM NPR to include new policy for:
    - Tribal consultation;
    - Protection of sensitive cultural resources data;
    - Ongoing professional development of CRM personnel;

  - Treatment of unevaluated or "potentially eligible" resources;
  - Management of archaeological resources; and
  - Coordination with NEPA.
- The NEPA/NHPA Desk Guide (2015), which offers Best Management Practices for integrating the two review processes.
- The NID for NHPA Section 111 leases, which addresses:
  - The authorities for and applicability of Section 111 leases;
  - The process by which a Center might enter into a Section 111 lease, including coordination with the SHPO;
  - Required stipulations of a Section 111 lease, including provisions for the ongoing protection of the leased historic property; and
  - Permitted uses for the funds derived from the lease, consistent with Section 111.

4.2 QUESTION 7

Has your agency employed partnerships to assist in the protection of historic properties?

Yes. NASA has partnerships in place and actively seeks to develop new partnerships with government and private entities to protect historic properties. This approach is consistent with NASA's belief that the best way to protect historic properties is through continued use. Several examples of NASA's partnerships are presented in Section Three, including Tribal engagement and the management of KSC's northern end by FWS and NPS. Select highlights of protection partnerships at NASA Centers are provided below.

Leases of the Historic Properties at ARC

ARC leases several of historic buildings on the Ames campus and the Shenandoah Plaza Historic District to public and private entities, including Carnegie Mellon University and the California Air National Guard. Provisions for the ongoing protection and upkeep of the property are included in all lease agreements. An example of this is ARC's recent lease of Moffett Field to Planetary Ventures, a subsidiary of Google. A stipulation of the lease requires the tenant to undertake the remediation and reskinning of Hangar One, a NRHP-listed property, management of which has been a major challenge for ARC (Figure 7).

Figure 7: ARC Hangar One in 2014, ARC (Credit: NASA)

Apollo Mission Control Center (MCC) at JSC

A shining example of NASA partnering to protect historic properties is being carried out under the dedicated leadership of the Center CRM at JSC, who has long advocated for the restoration of the MCC, one of NASA's most recognized NHLs. Concerns expressed by the National Park Service (NPS) in 2014 about the future of the resource prompted accelerated discussions on approaches to its restoration that have come to fruition during the reporting period. A partnership has formed between JSC, the non-profit Space Center Houston (SCH), and the City of Webster, Texas, with support from the ACHP, the Texas SHPO, NPS, the National Trust for Historic Preservation (NTHP), and retired Apollo Program flight directors, to restore the Apollo MCC to its appearance during the Apollo Program. The restoration will be carried out with the aid of a historic furnishings report prepared by the NPS. Section 106 consultation held in April 2017 resulted in a no adverse effect determination with concurrence from all consulting parties.

Execution of the project has been enabled by the fundraising efforts of SCH, an affiliate of the Smithsonian, with a significant donation from the City of Webster, which seeks to promote heritage tourism in the area. Transfer of funds from SCH to NASA was facilitated through the ACHP under the authority of the NHPA (54 U.S.C. §304105(g)(2)) and EO 13287 Section 4(c), which states that ACHP "is directed to use its existing authority to encourage and accept donations of money, equipment, and other resources from public and private parties to assist other agencies in the preservation of historic properties in Federal ownership to fulfill the goals of the NHPA and this order." This is the first instance of ACHP exercising its authority under this section of the EO, and its application here will serve as a successful case study for other federal agencies seeking to restore historic properties.

Figure 8: Apollo MCC, JSC, in 1969 (Credit: NASA)

4.3 QUESTION 8

Does your agency use program alternatives such as PAs, Program Comments, and other tools to better manage and protect your agency's historic properties?

Yes. NASA's first PA was executed with ACHP and the National Conference of State Historic Preservation Officers (NCSHPO) in 1989 and is still in effect. This nationwide PA addresses alterations to NASA's NHLs following their designation through "Man in Space" in 1984. The agreement stipulates that NASA will consult with the appropriate SHPO prior to the alteration or demolition of an NHL, and that specific mitigation measures will be carried out (i.e., recordation and salvage).

The nationwide PA remained NASA's only Section 106 program alternative until the 2002 execution of ARC's PA with the California SHPO and ACHP regarding the management and protection of the Shenandoah Plaza Historic District and NASA Research Park Moffett Field. This was followed by KSC's 2009 PA with the Florida SHPO and ACHP regarding the management of historic properties at the Center. Today seven NASA Centers have PAs in place and another three Centers are in the process of developing them (Table 6).

As of this reporting period, NASA has not explored in earnest other program alternatives, but welcomes input from the ACHP on their applications to NASA's CRM Program.

4.4 QUESTION 9

Provide specific examples of major challenges, successes, and/or opportunities your agency has encountered in protecting historic properties over the past three years.

Successes

NASA is proud of the partnership to restore the Apollo MCC at JSC, described in Section 4.2 of this report. This project is a notable example of the successful implementation of the goals set forth in EO 13287 to protect historic properties and use them to promote heritage tourism. NASA looks forward to reporting on the completed restoration project in coming years. In 2016 JSC hosted over one million visitors, and SCH and JSC expects this number to increase substantially once the restoration is complete.

Challenges

NASA continues to be challenged in balancing the protection of historic properties with the Agency's "Reduce the Footprint" initiative, which disproportionately impacts older and outdated facilities.

Additionally, NASA's CRM Program is facing retirement of approximately half of the Center CRMs in the next five years. Many of these CRMs have served in their roles for ten or more years; as such they possess tremendous knowledge about NASA's historic properties and have developed close working relationships with their respective SHPOs. Although NASA's agency-wide CRM policies and procedures have been formalized in recent years, the Center CRMs have not always translated their institutional knowledge onto paper. New CRMs may be faced with a steep learning curve as they settle in to their positions.

SECTION FIVE UTILIZING HISTORIC PROPERTIES

5.1 QUESTION 10

Do your agency's historic federal properties contribute to local communities and their economies? Is the use of historic properties encouraged and promoted within your agency?

Yes. NASA's preferred approach to the preservation of historic properties is through continued use in support of the Agency's diverse and evolving missions, and their use is encouraged and promoted through NASA policy. The reuse of historic properties is advantageous to NASA not only because it is consistent with the Agency's role as a steward of cultural heritage, but also because it is considerably less expensive to modify an existing building or structure than it is to construct new. Many of NASA's historic buildings and structures have been modified to serve successive programs and missions since the late 1950s. Consistent with the ACHP's guidance on technical and scientific historic properties, and NPS guidance on special categories of resources such as movable and aviation resources, NASA views this continual process of modification to be a character-defining feature of its historic properties.

When historic properties are reused, they remain economically viable and they in turn contribute to the economic viability of the NASA Center and the surrounding area. NASA has the advantage of being an agency whose activities are of great interest to Americans of all ages and backgrounds, and the presence of a NASA facility in a community is a source of pride – and employment – for residents. NASA's close relationship with the DoD, with highly-specialized contractors such as Boeing and Aerojet Rocketdyne, and now with entrepreneurial commercial enterprises including SpaceX, draws other businesses and services to NASA Centers, further contributing to local economies. Many of these partners lease NASA facilities, some of which are historic properties as described in Section 5.5, below. These symbiotic relationships contribute to local communities through the advancement of U.S. commercial space capabilities and the resulting growth of associated small businesses and creation of job opportunities.[5]

Figure 9: Engine Testing for Boeing's CST-100 Starliner Service Module, 2016

As described in Sections Three and Four of this report, NASA policy calls for consideration of historic properties early and at multiple stages of Agency planning, from high-level programming at HQ to Center-level master planning and real estate

[5] https://www.nasa.gov/press-release/nasa-establishes-new-public-private-partnerships-to-advance-us-commercial-space https://www.nasa.gov/sites/default/files/files/NASA_Partnership_Report_LR_20140429.pdf

management. Early consideration is key, as it enables NASA to explore alternatives to disposition well in advance of an undertaking. The reuse of historic properties is reinforced in NASA's NPR for Facility Project Requirements (NPR 8820.2G), which stipulates that an adaptive reuse feasibility report be prepared in coordination with the Center CRM for historic properties under consideration for demolition. The feasibility report aims to address all possible future uses, including use by an outside party.

NASA estimates that 93% of its identified historic properties are in active use either by NASA or a tenant, and approximately 10% of historic properties are leased, primarily at ARC and KSC. For example, 37 of the 45 contributing resources within ARC's Shenandoah Plaza Historic District are in use, 5 by NASA and 32 by an outside party. At KSC, approximately 75% of its historic properties, including contributing resources, are currently utilized. A notable case of historic property reuse by NASA is the interior of the Vehicle Assembly Building (VAB) at KSC, which is in the process of modification to accommodate the new SLS rocket (Figure 10). The platforms within the VAB high bays have been replaced several times since the building's original construction for Apollo in 1964, first to accommodate the SSP and now for the SLS.

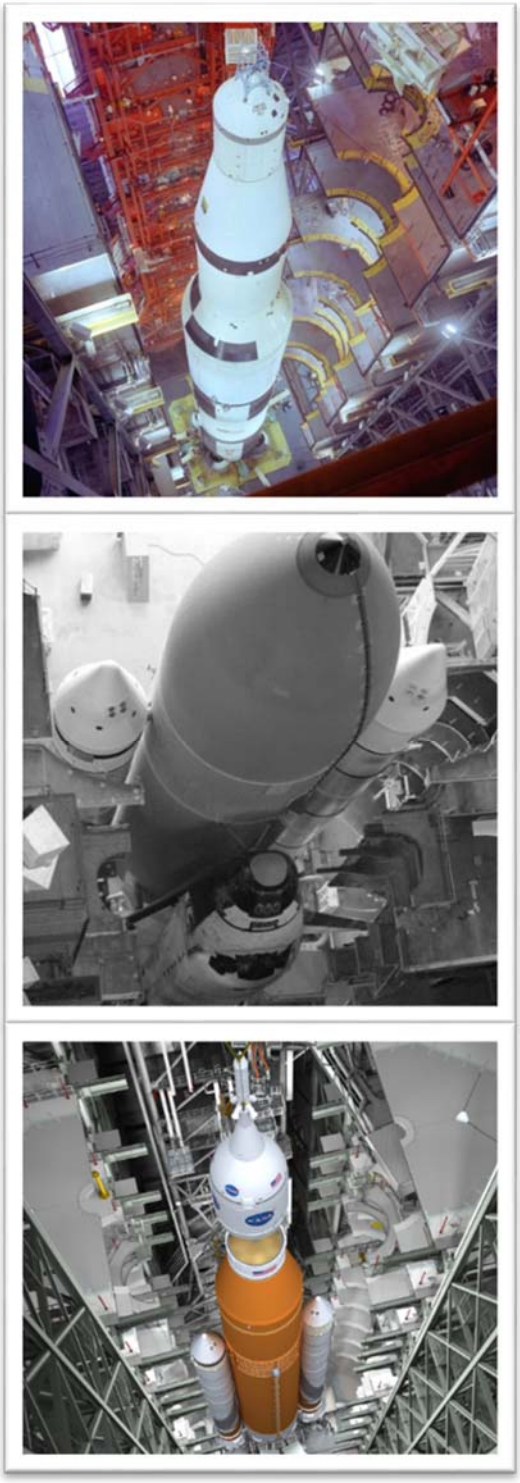


Figure 10 (from top to bottom): VAB interior platforms as originally constructed for Apollo, 1967; reconfigured for Shuttle, 2005; current configuration for SLS, 2017 (Credit: NASA)

Other highlights of active historic property utilization at NASA Centers are provided below.

- GRC – 3 research centers (including 1 NHL) within the Glenn Research Center (Lewis Field) Historic District;
- JPL – 2 NHLs utilized for their original purpose;
- KSC – Use of Launchpad 39A by SpaceX; and
- MAF – Building 420 leased to Big Easy Studios, a private film production company.

WSTF Propulsion Test Areas

While modification is accepted as a necessary part of the continued use of its historic properties, NASA appreciates the importance of retaining NHPA integrity and seeks to do so where feasible. This balance is illustrated at White Sands Test Facility (WSTF), where the 300 and 400 Propulsion Test Areas (300 and 400 Areas), both NRHP-eligible historic districts, have been in continuous use since the 1960s. The design and setting of both districts were changed with the construction of new facilities after 1971: support systems for propellant handling, water treatment, and electricity have been upgraded and modified since the period of significance, but these changes did not alter the overall design or function of the district. The districts retain their continuity of use and association from the period of significance to the present, and as such there is a direct link to the historic events of America's manned spacecraft program. Following formal consultation between WSTF and the New Mexico SHPO in 2015, the modification of the 300 and 400 Areas was again undertaken to support lease of the resources to Boeing and Aerojet Rocketdyne for development of Boeing's Crew Space Transportation (CST)-100 Starliner spacecraft. Part of NASA's Commercial Crew Program (CCP) and the Orion European service module for Exploration Mission-1, the CST-100 is designed to enable low-Earth orbit for seven passengers.

5.2 QUESTION 11

Explain how your agency uses historic properties to foster heritage tourism, when consistent with agency missions.

The inherent fascination with space exploration and the profound imprint that NASA's missions have had on American culture make heritage tourism a natural area for public engagement. NASA recognizes that access to its historic properties – the "real thing" – is an important part of the public experience, engendering continued support for the Agency's programs and missions. Accordingly, NASA Centers invest time and effort into a broad range of heritage tourism activities, including school visits, public tours, and events. A few highlights from the reporting period are presented below.

Figure 11: Former NFL athletes at JSC's Apollo MCC as part of Superbowl LI events, 2017 (Credit: NASA)

NASA Visitor Centers

As the primary point-of-access for the general public, NASA's Visitor Centers represent a successful and high-priority partnership for the Agency. Operated by private entities and located on or adjacent to NASA Centers, Visitor Centers provide a venue outside of the standard security requirements for the Agency to receive and present information to the public.

KSC and JSC are perhaps the most well-known – and most visited – of the NASA Centers, and their presence has contributed significantly to heritage tourism in their respective geographical areas (Table 7).

Table 7: Visitor Center Attendance, JSC and KSC

Center	FY 2015	FY 2016	FY 2017
JSC	924,592	1,050,477	497,334*
KSC	1,514,200	1,652,289	In Progress

*As of July 2017.

Historic properties at both Centers are some of the tour highlights, including the Apollo MCC and the Shuttle Avionics Integration Laboratory (SAIL, Building 9) at JSC; and Launchpads 39A and B, the VAB, and the crawlerway at KSC. The impact of NASA's early space exploration missions on the collective conscious is powerfully illustrated in the fact that the roughly 70 miles of Florida coastline in Brevard County, where KSC is located, is locally referred to as the "Space Coast".

Heritage Tourism at ARC

During the reporting period the public had a variety of opportunities to experience historic properties at ARC, located at Moffett Field, California. Highlights from 2015 included an all-day open house to celebrate the center's 75th anniversary, several cohorts of Science, Technology, Engineering, and Mathematics (STEM) students, and two high-profile events: a visit by the U.S. Secretary of Defense and an award ceremony for the Breakthrough Prize in Life Sciences and Physics, which is awarded to individuals who have made significant contributions to the fields of fundamental physics, life sciences, or mathematics. Hosted by Seth MacFarlane, the award ceremony was held inside of ARC's NRHP-listed Hangar One, and was attended by such luminaries as Mark Zuckerberg, General David Petraeus, and Russell Crowe (Figure 12). These and other functions in and around ARC's historic buildings were attended by over 161,000 visitors during fiscal year 2015.

In 2016 nearly 10,000 people took guided tours of ARC. The Shenandoah Plaza National Historic District at ARC is also a popular locale for holding public events of all sizes, including NASA's traveling ISS exhibit, the Destination Station trailer, and NASA's Solar System Exploration Research Virtual Institute's third annual Exploration Science Forum and the Third International Conference on the Exploration of Phobos and Deimos.

Figure 12: Hangar One at ARC during the Breakthrough Prize Awards Ceremony, 2016 (Credit: Justin Bishop, *Vanity Fair*)

GRC Historic District Celebration

In 2015, GRC's gate-to-gate cultural resources survey was completed, resulting in the identification of the Glenn Research Center (Lewis Field) Historic District. GRC worked with the Ohio SHPO on a historical marker for the district, which was presented at a ceremony held at GRC. The ceremony included remarks by NASA GRC senior leadership, a video presentation on the Center's history, and a formal unveiling of the historical marker (Figure 13). The Ohio SHPO also presented GRC with a commendation for their work in recognizing and preserving the district.

In the weeks leading up to the ceremony, GRC also participated in the Ohio SHPO's "Ohio Open Doors" Program, hosting three historic district tours for the public that features GRC's NHL, the Zero Gravity Research (ZGR) Facility. GRC's enthusiastic response to the identification of the Glenn Research Center Historic District and the subsequent public recognition reflects the Center's pride in their historic properties.

Figure 13: Historical Marker for Glenn Research Center (Lewis Field) Historic District, 2015 (Credit: NASA)

Figure 14: LaRC 100th Birthday Celebration, 2017 (Credit: NASA)

LaRC 100th Birthday

In 2017 LaRC celebrated 100 years of excellence in aerospace achievements, scientific discoveries, and technological breakthroughs (Figure 14). The celebration featured a three-day symposium on the history and future of LaRC, open to the public, a photography exhibit at the Chrysler Museum in Norfolk, Virginia, and an open house at the Center that showcased Langley's contributions to the industry.

Hidden Figures Screening at KSC

In fiscal year 2017, responding to interest from the movie *Hidden Figures*, KSC held several events to honor the legacy of female and African-American employees and their contributions to the U.S. Space Program. In December 2016 a panel was held with the director, composer, and actors of the film. Several screenings of the film were open to the public. Additionally, in honor of Women's History Month and African American History Month, presentations were given in 2017 by authors Wanda Harding, Richard Paul, and Steven Moss.

Kármán Lecture Series at JPL

The Theodore von Kármán Lecture Series, named after JPL's founder, and presented by JPL's Office of Communication and Education, brings the excitement of the space program's missions, instruments and other technologies to both JPL employees and the local community through lectures given twice a month. The event is open to the public, although the limited seating has led to

their live stream via Ustream, an IBM-sponsored streaming and online video site, to maximize public participation.

Creative Mitigation at SSFL

In addition to in-person events, NASA is seeking new ways to bring the experience of its discoveries and historic properties to the public through technology. In the reporting period NASA developed several 3-D "fly throughs" of historic properties as Section 106 mitigation, including at SSFL and the Apollo Mission Control at JSC. Visitors to the SSFL website can take a virtual tour of SSFL and view drawings, renderings, and historic photos of the test stands and supporting infrastructure (Figure 15). The tour is available at:

https://www.nps.gov/HDP/exhibits/ssfl/tour/index.html.

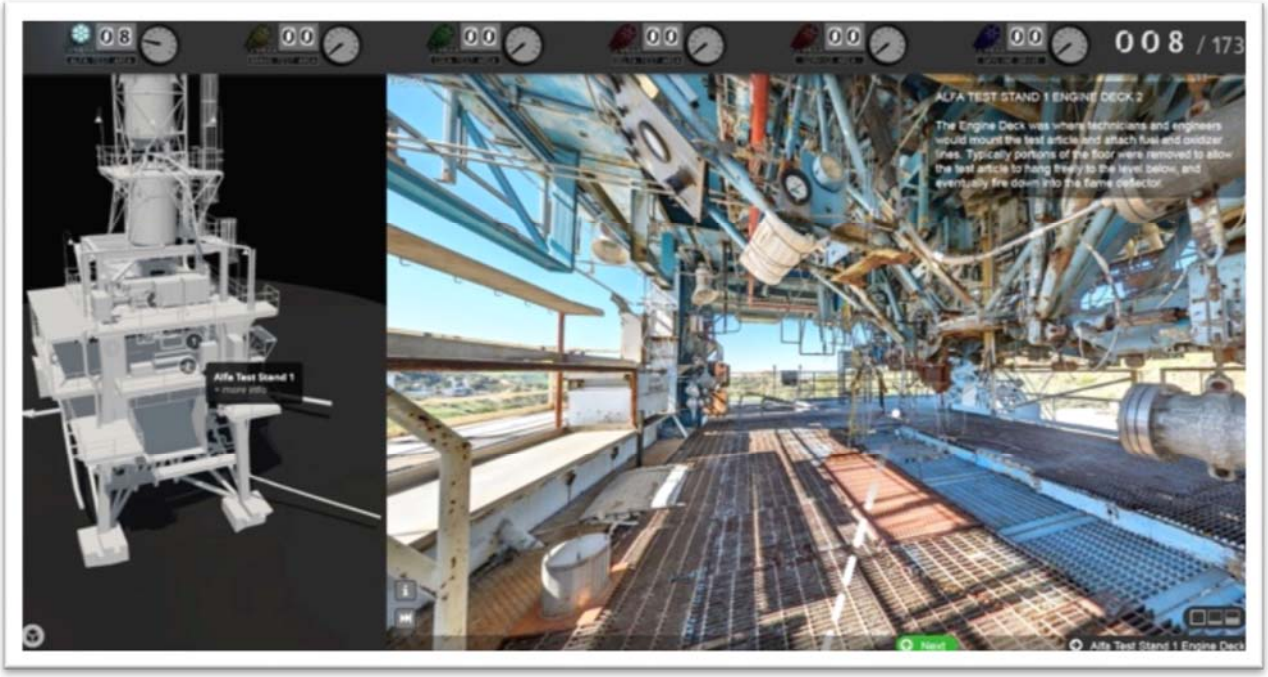


Figure 15: Screenshot of 3-D Tour of Alfa Test Stand No. 1, SSFL (Credit: NASA)

5.3 QUESTION 12

If your agency is subject to the requirements of the Federal Assets Sale and Transfer Act (Property) and the Federal Property Management Reform Act (described above) how will their requirements affect your agency's ability to protect and use its historic properties?

NASA is subject to these laws, and their impact on NASA's management of historic properties is not yet clear. NASA submitted its recommendations to the Public Buildings Reform Board (PBRB) in April 2017, identifying three facilities for consideration, all of which are non-contiguous to NASA Centers and as such are more marketable than real property located within the Centers. Among the facilities identified for possible disposal was the entirety of NASA's holdings at SSFL, which includes three historic districts and multiple archaeological sites. Also recommended for consideration was a parcel of open land held by ARC known as Crow's Landing. No cultural resource survey has been conducted at Crow's Landing, so the presence of historic properties is not known. Should either of these recommendations be carried forward by the PBRB, NASA expects to coordinate with GSA for compliance with Section 106 of the NHPA, as appropriate for the transfer of property out of federal ownership.

5.4 QUESTION 13

How is your agency meeting the requirements of EO 13693, Planning for Federal Sustainability in the next Decade?

Every year, NASA prepares a *Strategic Sustainability Performance Plan* (SSPP), in which NASA presents its plan to "execute the mission without compromising the planet's resources so that future generations can meet their needs."[6] The 2015–2017 plans highlight initiatives underway at NASA in response to EO 13693, including:

- Using master plans and capital investment plans to inform construction and demolition investments to reduce life cycle costs of ensure stewardship of the infrastructure required to support missions and capabilities; and
- Mandating Centers to develop plans and strategies to incorporate technologies and best practices that will enable them to identify and execute the most cost effective energy initiatives, which will improve NASA's energy security and reduce the Agency's total life-cycle costs in support of missions.

Although the SSPPs do not specifically address historic properties, as noted elsewhere in this report, NASA's policies and procedures across real property management and planning departments specifically address the need to consider repurposing of existing facilities – both historic and non-historic. As NASA's sustainability program develops, NASA's CRM Program personnel will be seeking opportunities for more direct discussion on the value of historic properties within this context consistent with broader discussions within the professional CRM community.

5.5 QUESTION 14

Does your agency use, or has it considered using, Section 111 (now 54 U.S.C. § 306121) of NHPA to lease or exchange historic properties?

[6] *National Aeronautics and Space Administration Strategic Sustainability Performance Plan*, 30 June 2017 draft.

Yes. As noted above, NASA has developed a NID on the use of Section 111 leases (Section 4.6). This policy will support NASA's use of leasing as a way to enhance its facilities management.

ARC and Planetary Ventures

In 2015, NASA ARC entered into a 60-year NHPA Section 111 lease with Planetary Ventures, a subsidiary of Google, for approximately 1000 acres that includes Hangar One, Hangar Two, Hangar Three, Building 158, the Moffett Field, and the golf course. The lease area falls within the NRHP-listed Shenandoah Plaza Historic District. NASA ARC is using proceeds from the lease to maintain and upgrade its historic properties. This is the first Section 111 lease NASA has executed, and it is serving as a pilot and model for future leases.

5.6 QUESTION 15

Explain how your agency has employed the use of partnerships to assist in the use of historic properties.

KSC is supporting public and private partnerships through leases that include historic properties. Examples of NASA partnerships with external parties are provided below.

- Space Florida, which signed a 30-year property agreement for the use of the Shuttle Landing Facility Historic District, and leases the Orbiter Processing Facility (OPF) 3; the latter is used by Boeing to manufacture its CST-100 spacecraft.
- U.S. Air Force, to which several historic properties in the NHL-listed Cape Canaveral Air Force Station Historic District have been transferred over the years.
- Boeing, which has a lease agreement with NASA and the Air Force for OPF 1 and 2.
- SpaceX, which has a lease agreement with NASA for the NRHP-listed Launch Complex 39A Historic District. This example is especially notable, as SpaceX has managed to maintain a majority of the historic structure while meeting their current technological/operational needs for launch. In the past few months they have used this pad for historic first launches, including the first-ever return of a rocket first stage. This will contribute to LC-39A's overall legacy in the U.S. Space Program.

Figure 16 (from left to right): KSC Launch Complex 39A configuration for Apollo, 1972; for Shuttle, 2009; and for SLS, 2017 (Credit: NASA)

JSC has issued a use permit to Lockheed Martin for the Operations & Checkout High Bay and the Canister Rotation Facility, for the manufacture of the new Orion MPCV

In addition to the Planetary Ventures lease of Moffett Field, ARC is supporting public/private partnerships through leases that include historic properties. Examples of its external partners include:

- U.S. Geological Survey, which is entering into a lease to occupy Building 19 within the NRHP-listed Shenandoah Plaza Historic District;
- Carnegie Mellon University, whose west coast campus is housed in Buildings 23 and 24 within the Shenandoah Plaza Historic District;
- InformArt, who provides information technology solutions for the transportation industry, and occupies Building 18 within the Shenandoah Plaza Historic District; and
- California Air National Guard, who utilizes the runway at Moffett Field.

5.7 QUESTION 16

Provide specific examples of major challenges, successes, and/or opportunities your agency has encountered in using historic properties over the past three years.

Successes

During the reporting period, NASA has had a number of successes in using historic properties, many of which are presented above, including reconfiguring the platforms within the VAB at KSC to fit the SLS, the Apollo MCC restoration at JSC, and the use of the 300 and 400 Areas Historic Districts at WSTF.

Challenges

NASA challenges with respect to the use of historic properties are the same as those for identification and protection: in particular, budget reductions and the "Reduce the Footprint" strategy.

APPENDIX

NASA-owned Historic Properties and Districts
(Including the Cape Canaveral Air Force Station National Historic Landmark District)
Kennedy Space Center 2017