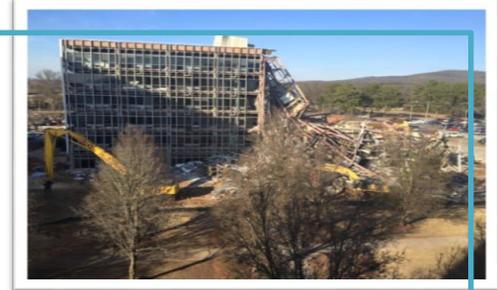


NASA Mission Support Budget Status Update

Lynn Irvine
Mission Support Directorate
March 16, 2016



Security Operations Center, ARC



Demolition of MSFC Building 4202

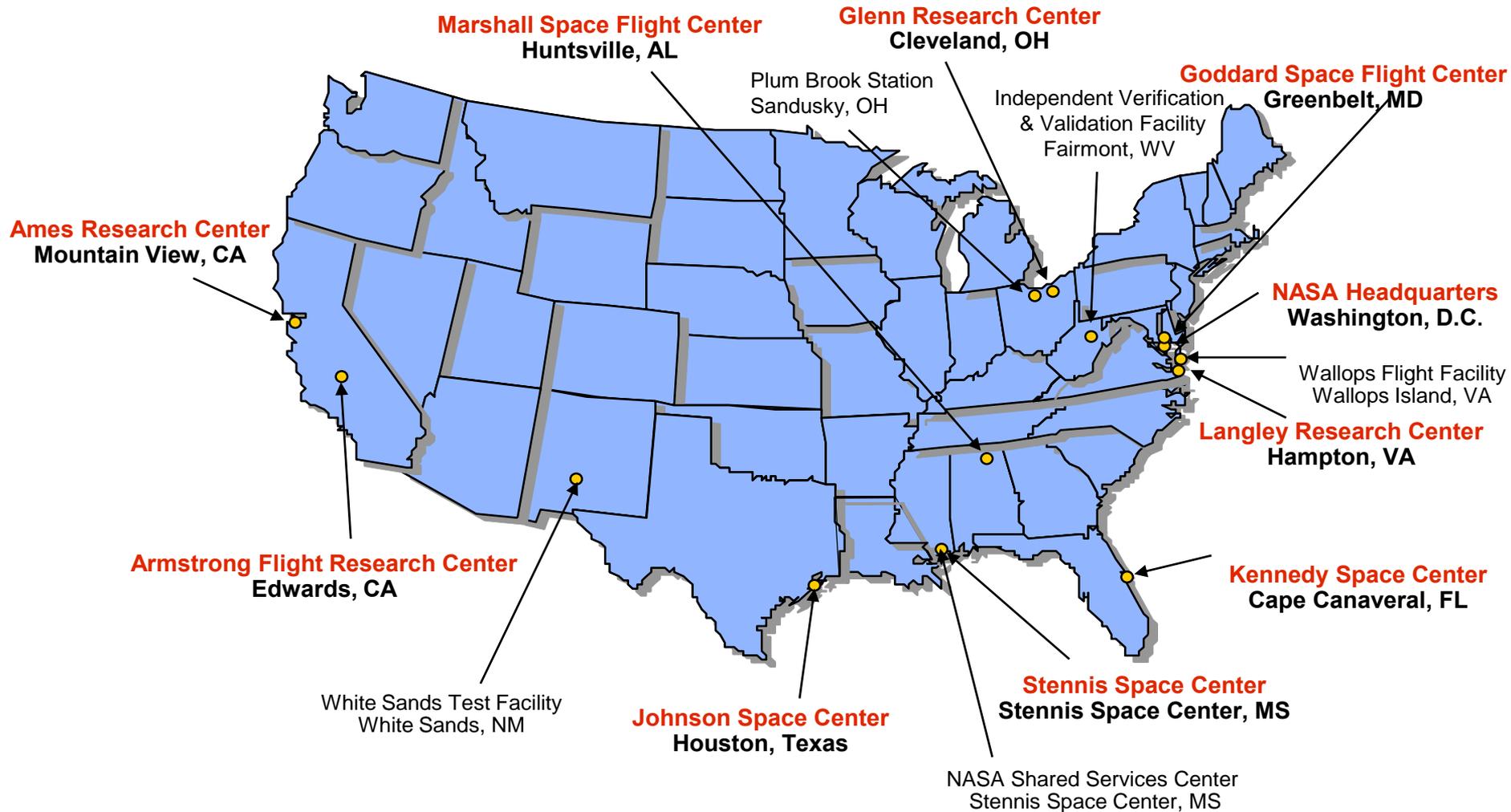


LEED Gold Integrated Engineering Services, LaRC



Mission Support

Mission Support Directorate

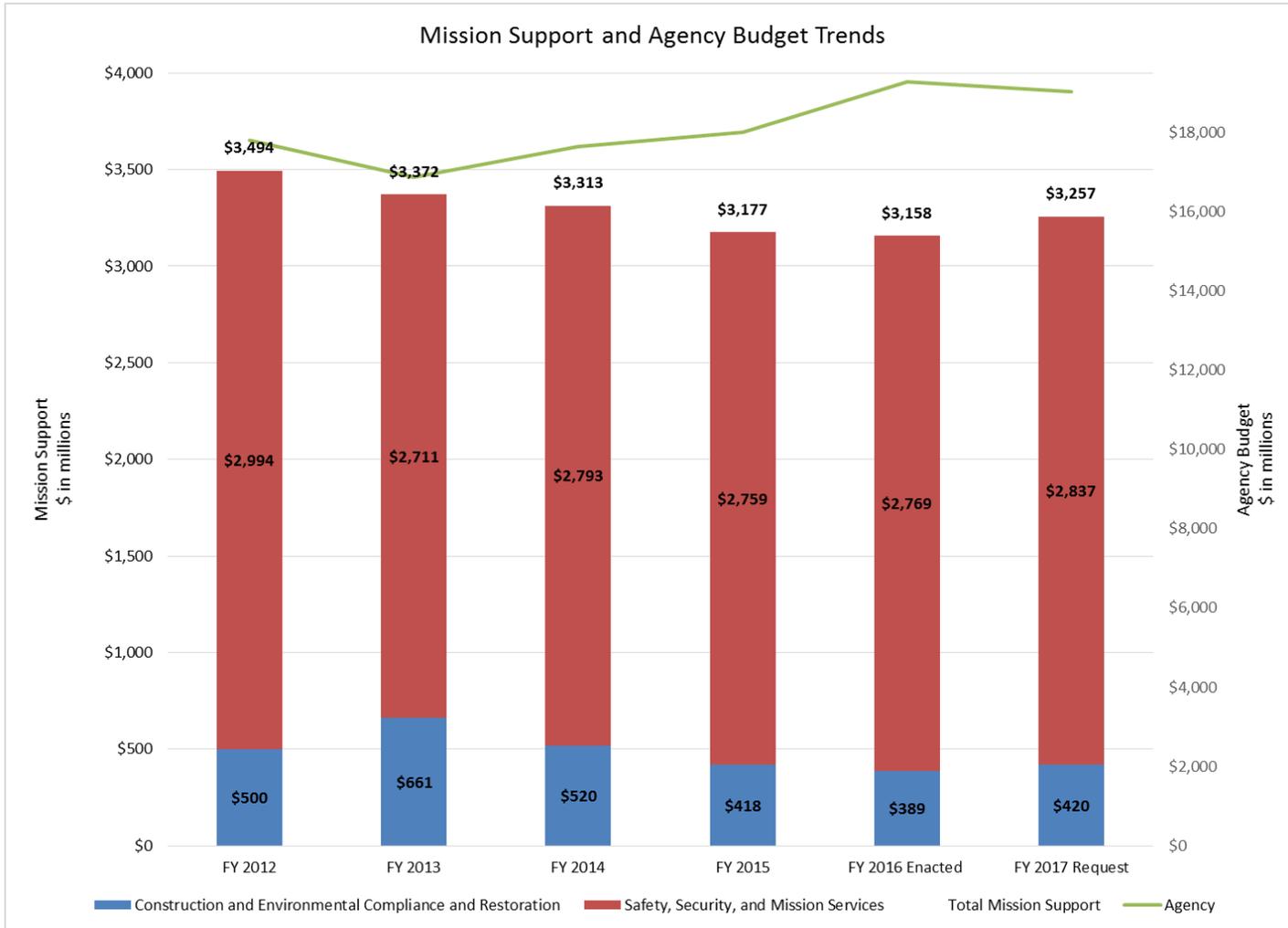


Mission Support: Serve the American public and accomplish our Mission by effectively managing our people, technical capabilities, and infrastructure.



Mission Support and Agency Budget Trends

Mission Support Directorate





FY 2016

Mission Support Budget Status

Mission Support Directorate

\$ in millions	FY 2015	Transfers for Network Transformation	Other Changes from FY15	FY 2016 Current Estimate	Change from Request
Construction & Envrmtl Compl Restoration	\$412.5			\$388.9	-\$76.4
Construction of Facilities	\$340.8			\$314.4	-\$60.4
Aeronautics CoF	\$0.5			\$0.0	\$0.0
Institutional CoF	\$276.5			\$278.2	-\$60.4
Exploration CoF	\$43.3			\$10.0	\$0.0
Space Ops CoF	\$18.8			\$26.2	\$0.0
Science CoF	\$1.7			\$0.0	\$0.0
Envrionmental Compliance and Restoration	\$71.7			\$74.5	-\$16.0
Safety, Security, and Mission Services	\$2,758.9	\$0.0	\$9.7	\$2,768.6	-\$74.5
Agency Management and Operations	\$734.1	\$37.6	\$9.7	\$781.4	-\$24.1
Agency IT Services (AITS)	\$175.5	\$40.5	\$0.0	\$216.0	-\$3.5
Agency Management	\$366.0	-\$2.9	-\$0.8	\$362.3	-\$30.2
Safety and Mission Success	\$165.7		\$10.5	\$176.2	\$9.6
Chief Engineer	\$83.4		\$0.0	\$83.4	\$0.0
Chief Health and Medical Officer	\$4.2		-\$0.2	\$4.0	-\$0.2
Independent Verification and Validation	\$29.4		\$9.7	\$39.1	\$10.2
Safety and Mission Assurance	\$48.7		\$1.0	\$49.7	-\$0.4
Strategic Capabilities Assets Program	\$26.9		\$0.0	\$26.9	\$0.0
Center Management and Operations	\$2,024.8	-\$37.6	\$0.0	\$1,987.2	-\$50.4
Grand Total	\$3,171.4	\$0.0	\$9.7	\$3,157.5	-\$150.9

- FY 2016 enacted funding at approximately the FY 2015 enacted level
 - Need to absorb cost increases and content changes, including \$ required to retire KSC firefighters pension liability (~\$13M spread across centers plus additional funding from KSC)
- CECR reduced \$76.4M (-16.4%) reduction from FY 2016 requested level.
- SSMS reduced \$74.5M (-2.6%) reduction from FY 2016 requested level.



FY 2017

Mission Support Budget Request

Mission Support Directorate

\$ in millions	FY 15 Actual	FY 2016 Current Estimate	FY 2017	Outyears are notional			
				FY 2018	FY 2019	FY 2020	FY 2021
Construction & Envrmtl Compl Restoration	\$446.1	\$388.9	\$419.8	\$390.2	\$398.0	\$406.0	\$414.1
Construction of Facilities	\$374.4	\$314.4	\$328.0	\$297.9	\$303.8	\$310.1	\$317.9
Aeronautics CoF	\$9.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Exploration CoF	\$67.9	\$10.0	\$8.8	\$0.0	\$0.0	\$0.0	\$0.0
Institutional CoF	\$276.5	\$278.2	\$290.7	\$297.9	\$303.8	\$310.1	\$317.9
Science CoF	\$1.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Space Operations CoF	\$19.3	\$26.2	\$28.5	\$0.0	\$0.0	\$0.0	\$0.0
Environmental Compliance and Restoration	\$71.7	\$74.5	\$91.8	\$92.3	\$94.2	\$95.9	\$96.2
Safety, Security, and Mission Services	\$2,754.6	\$2,768.6	\$2,836.8	\$2,893.6	\$2,951.5	\$3,010.4	\$3,070.6
Center Management and Operations	\$2,023.7	\$1,987.2	\$2,017.7	\$2,058.1	\$2,113.5	\$2,155.6	\$2,198.8
Agency Management and Operations	\$730.9	\$781.4	\$819.2	\$835.5	\$838.0	\$854.8	\$871.8
Agency IT Services (AITS)	\$175.5	\$216.0	\$244.3	\$249.1	\$235.6	\$240.3	\$245.0
Agency Management	\$363.6	\$362.3	\$377.5	\$385.1	\$395.6	\$403.5	\$411.6
Safety and Mission Success	\$164.9	\$176.2	\$170.4	\$173.8	\$178.5	\$182.1	\$185.7
Strategic Capabilities Asset Program	\$26.9	\$26.9	\$27.0	\$27.5	\$28.3	\$28.9	\$29.5
Grand Total	\$3,200.7	\$3,157.5	\$3,256.6	\$3,283.8	\$3,349.5	\$3,416.4	\$3,484.7

Note: Totals may not add due to rounding



Mission Support FY17 Budget Highlights

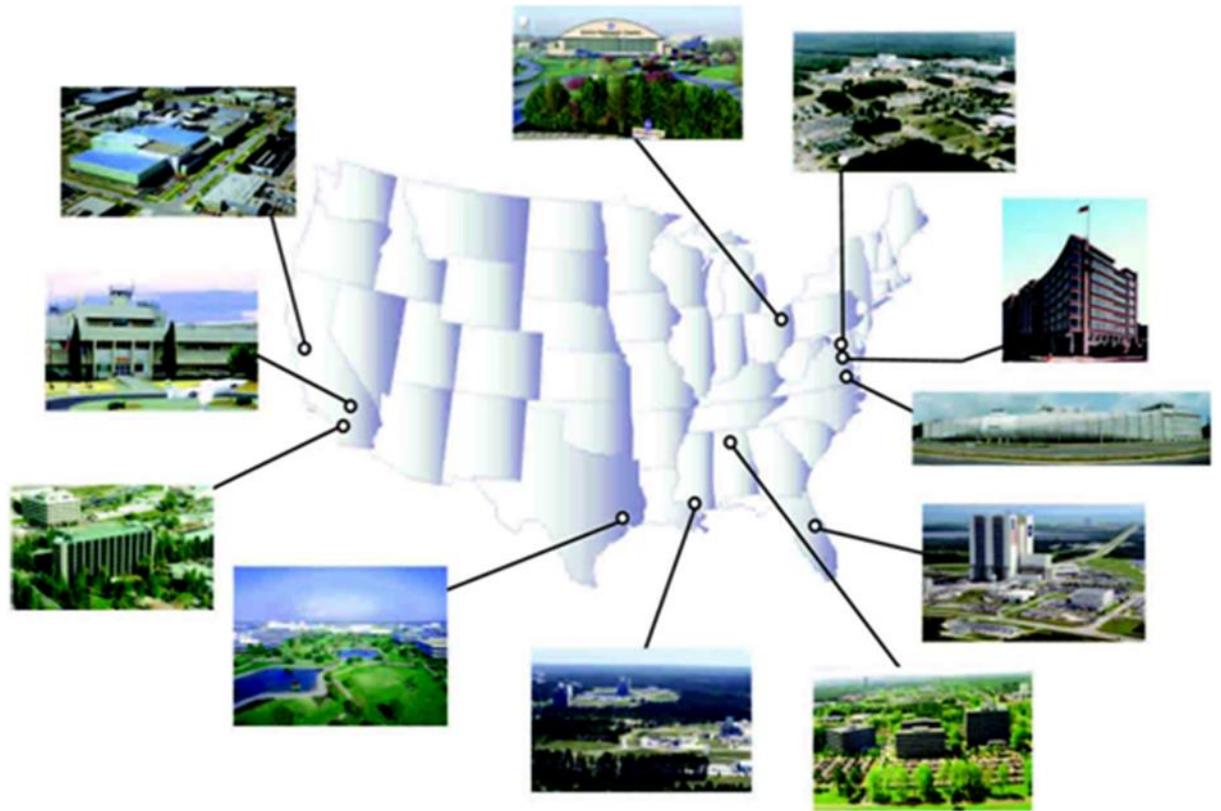
- Implements the long-term changes identified in the Business Services Assessment (BSA) of IT, acquisition, human capital management, budget management, and facilities management to optimize services and maintain a minimum set of capabilities to meet mission needs.
- Prioritizes activities consistent with the improvement opportunities identified through the 2015 Strategic Objective Annual Review.
 - Increases Institutional Construction of Facilities to address critical infrastructure repair and modernization requirements.
 - Reallocates funding to Agency IT Services to consolidate network operations under the Agency CIO.
 - Invests in IT infrastructure and enterprise solutions to modernize systems and optimize delivery of Agency-wide IT services.
 - Integrates, simplifies, and consolidates the IT infrastructure into a more secure, effective, and efficient environment.
- Provides a safe, reliable infrastructure by balancing the risks across services and activities.
- Continues to demolish unneeded facilities to reduce the Agency's footprint and operating costs.
- Invests in energy savings projects to reduce utility usage and costs.
- Continues cleanup of current or former sites where NASA operations contributed to environmental problems, including initial soil removal activities at Santa Susana Field Laboratory.



FY 2017 Budget Status

Mission Support Directorate

- MSD AA Krista Paquin briefed House Appropriation CJS Subcommittee staff (2/16) and Senate Appropriation CJS Subcommittee staff (3/04) on FY 2017 Mission Support request
- Administrator Bolden briefing Senate Appropriation CJS Subcommittee (3/10) and House Appropriation CJS Subcommittee (3/15) on FY 2017 NASA Budget Request
- House Appropriations CJS Subcommittee (Chm. Culberson, R-TX) is expected to mark up FY 2017 bill in early April. Senate Appropriations CJS Subcommittee (Chm. Shelby, R-AL) is expected to mark up FY 2017 bill in April.

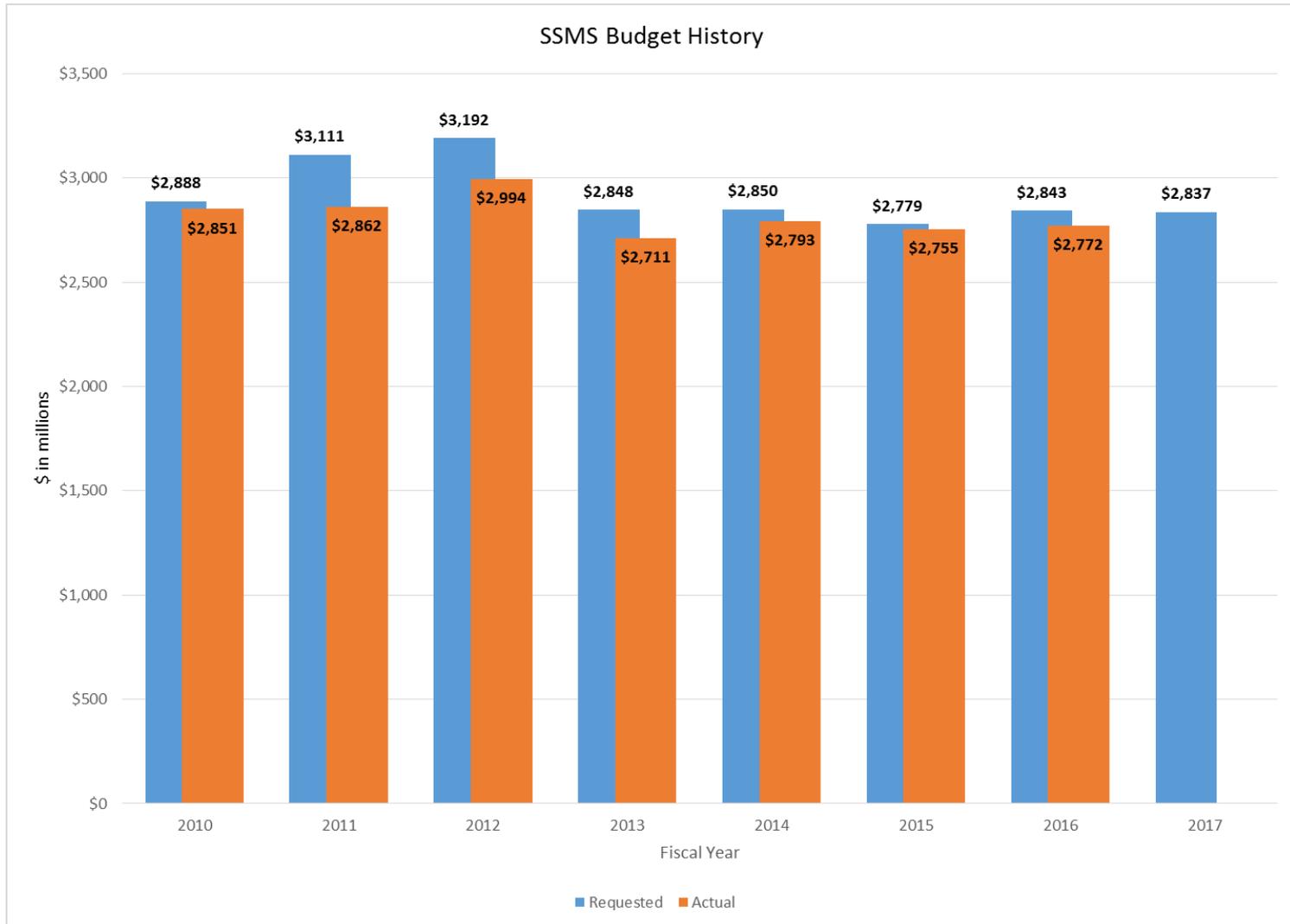


Safety, Security, & Mission Services



Safety, Security, and Mission Services (SSMS) Budget Trends

Mission Support Directorate





Center Management and Operations

Mission Support Directorate

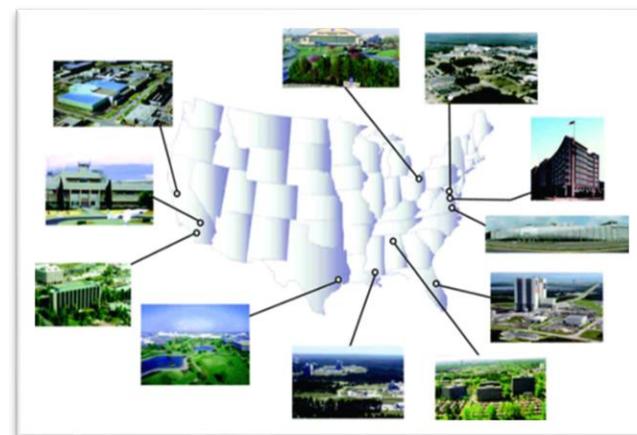
\$ in millions			Outyears are Notional				
	FY 2015	FY 2016 Enacted	FY 2017 Request	FY 2018	FY 2019	FY 2020	FY 2021
Center Management and Operations	\$2,023.7		\$2,017.7	\$2,058.1	\$2,113.5	\$2,155.6	\$2,198.8
Center Institutional Capabilities	\$1,574.8		\$1,563.8	\$1,596.7	\$1,636.9	\$1,665.1	\$1,696.1
Center Programmatic Capabilities	\$448.9		\$453.8	\$461.4	\$476.6	\$490.5	\$502.7
Grand Total	\$2,023.7		\$2,017.7	\$2,058.1	\$2,113.5	\$2,155.6	\$2,198.8

- Center Institutional Capabilities

- Essential business operations to run NASA Centers and component facilities as safe, healthy, and environmentally responsible workplaces.
 - Safety & security services, environmental management, and facility maintenance of ~4,400 buildings and structures.
 - IT, occupational health, equal employment opportunity, human resource, & training services to ensure the agency's workforce has the tools and capabilities required to meet mission requirements.
 - Financial management and acquisition capabilities for 41,000 annual procurement actions.
- Reallocates \$38.1 million to AMO Agency IT Services to consolidate network transformation activities under the CIO.

- Center Program Capabilities

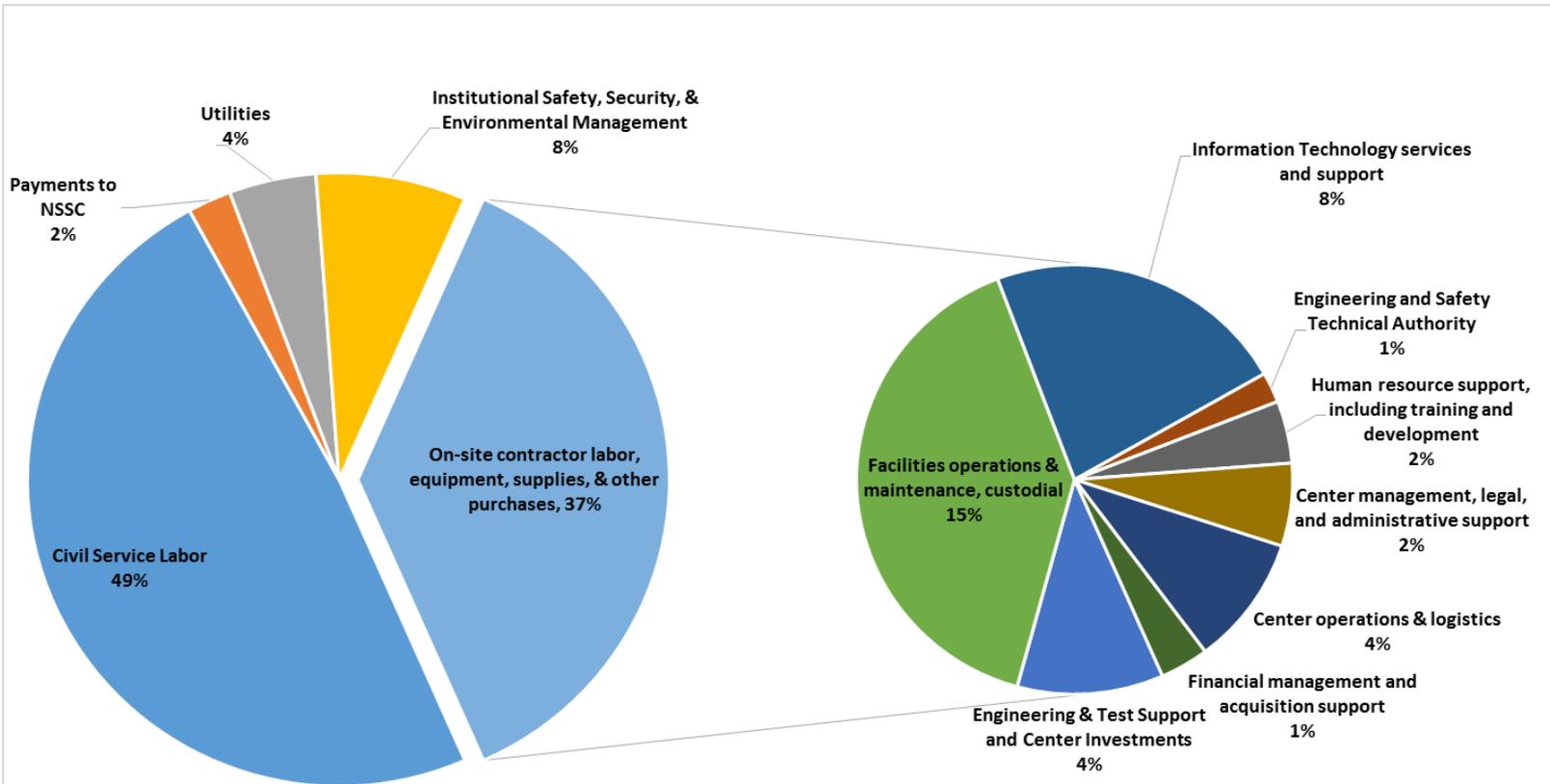
- Independent engineering assessment and safety oversight of NASA's program work.
- Operate and maintain technical facilities & laboratories, test services, and equipment.





Center Management and Operations

Mission Support Directorate



- ~60% of budget is relatively fixed in the near-term
- Request increases funding slightly (~1.5% above FY15) to partially offset inflationary increases in cost of operations



Balance Risks Across Services & Activities

Mission Support Directorate

- Reduce services and improve efficiency to offset inflationary cost increases.
 - Some institutional services are operating below established baseline levels, especially in Facilities Services and IT Services:
 - Reduce frequency of facilities maintenance and custodial support.
 - Defer replacement of some outdated and obsolete equipment.
 - Delay software and hardware maintenance activities such as maintenance of severe weather warning systems, application maintenance, cable plant operations, etc.
 - Longer lead time for acquisition and financial management support.
 - Implement cost saving improvements that do not require significant initial investment:
 - Continues activities to reduce operational costs. In FY 2015 Centers:
 - Upgraded lighting. Switching to LED bulbs improves efficiency and life, reducing operating and maintenance costs.
 - Expanded condition based maintenance programs. Investing in remote monitoring and predictive testing capability reduces the cost of routine maintenance. Stennis Space Center eliminated 2 work-years of maintenance requirements through a \$500K investment in remote monitoring.
 - Consolidated contract activities. New maintenance support contract will consolidate support for Michoud Assembly Facility and SSC into a single contract to leverage synergies between the two sites and reduce CMO and program costs.
 - Continue long-term process improvements identified through the BSAs of acquisition, human capital management, budget management and facilities management to optimize services, and maintain a minimum set of capabilities to meet mission needs.
- Ensure ongoing essential services, replace failed equipment, and meet emerging program and regulatory requirements:
 - Facility failures impact mission and require costly emergency repair. Recent examples include:
 - Cooling water system failure with 2 month shutdown to wind tunnel testing
 - Water main break undermining access to hangar
 - Emerging requirements for new badge readers and other security improvements.





Agency Management and Operations

Mission Support Directorate

\$ in millions	FY 2016		FY 2017 Request	Outyears are Notional			
	FY 2015	Enacted		FY 2018	FY 2019	FY 2020	FY 2021
Agency IT Services (AITS)	\$175.5		\$244.3	\$249.1	\$235.6	\$240.3	\$245.0
Agency Management	\$363.6		\$377.5	\$385.1	\$395.6	\$403.5	\$411.6
Safety and Mission Success	\$164.9		\$170.4	\$173.8	\$178.5	\$182.1	\$185.7
Strategic Capabilities Asset Program	\$26.9		\$27.0	\$27.5	\$28.3	\$28.9	\$29.5
Grand Total	\$730.9		\$819.2	\$835.5	\$838.0	\$854.8	\$871.8

Note: Totals may not add due to rounding

- Agency-wide management of Information Technology services including IT security policy and incident monitoring, Web services, network management, enterprise applications and consolidated end user base services.
 - Invests in IT infrastructure and enterprise solutions to modernize systems and optimize delivery of Agency-wide IT services.
 - Consolidates network operations, transformation, and voice services under the Agency CIO.
 - Integrates, simplifies, and consolidates the IT infrastructure into a more secure, effective, and efficient environment
- Essential functional and administrative management oversight for the Agency and operational support for NASA Headquarters.
 - Finance, protective services, general counsel, public affairs, external relations, legislative affairs, training, human capital management, procurement, real property and infrastructure, budget management, systems support, internal controls, diversity, equal opportunity, independent program and cost evaluation, and small business programs.
 - Continues funding to modify procurement and financial management systems to implement provisions of the Digital Accountability and Transparency Act.
- Engineering, safety, and health and medical technical authority to protect the health and safety of the NASA workforce and improve the likelihood for safety and mission success for NASA's programs, projects, and operations. Provides \$29 million for independent verification and validation of mission critical software.
- Maintains select critical test facilities in a state of readiness, providing the skilled workforce and essential maintenance required to ensure that capabilities are available to meet program requirements.



JPL Beam Waveguide 34 Meter Antenna, Madrid



ARC Biosciences Collaborative Facility



MSFC Revitalize Steam Distribution System

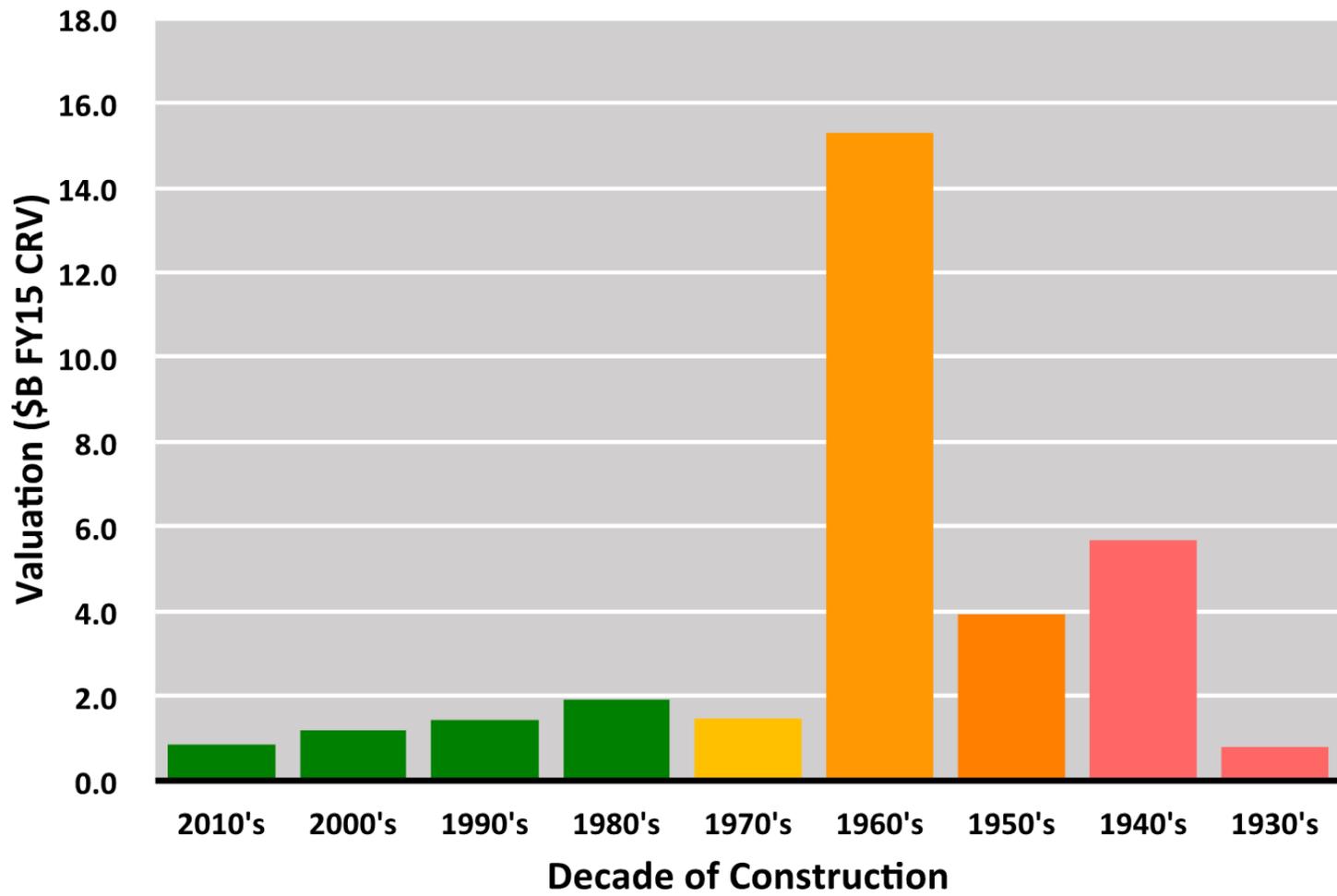


SSFL Demolition

CONSTRUCTION AND ENVIRONMENTAL COMPLIANCE & RESTORATION



Aging facility base drives operations, maintenance, and investment





Institutional Construction of Facilities

Mission Support Directorate

Construction of Facilities (\$ in millions)	FY 2016		FY 2017 Request	Outyears are Notional			
	FY 2015	Enacted		FY 2018	FY 2019	FY 2020	FY 2021
Institutional CoF	\$276.5		\$290.7	\$297.9	\$303.8	\$310.1	\$317.9
Exploration CoF	\$67.9		\$8.8	\$0.0	\$0.0	\$0.0	\$0.0
Space Operations CoF	\$19.3		\$28.5	\$0.0	\$0.0	\$0.0	\$0.0
Grand Total	\$374.4		\$328.0	\$297.9	\$303.8	\$310.1	\$317.9



- Repair and modernize electrical, mechanical, life safety, and utility systems
 - Projects mitigate near-term risk to mission & are selected using agency-wide prioritization process.
- Replace and rehabilitate aging facilities to increase efficiency and consolidate functions into a smaller footprint.
- Construct the Biosciences Collaborative Facility, ARC
 - Consolidate and modernize aging facilities into a smaller, energy-efficient research facility.
 - Replace existing deteriorated lab spaces with modern laboratory spaces to optimize collaboration and efficiency.
- Improve efficiency and reduce utility costs through energy savings investments.
- Demolish inactive and obsolete facilities to reduce the agency's facility footprint.





Meeting Agency Infrastructure Challenges

Mission Support Directorate

- Increases Institutional CoF to include some projects deferred from prior years.
 - FY 2017 plans include five previously requested projects.
 - Delayed projects increases NASA's repair backlog, increasing risk of failure and the cost of repairs.
- Includes energy savings and renewable energy projects.
 - Planned projects provide an 11.0 year payback.
 - NASA is actively reducing energy consumption to reduce greenhouse gas and meet goals. In FY 2015 NASA exceeded its Greenhouse Gas reduction targets: Scope 1 and 2 reduction of 26.7% against a target of 10.7%.
 - Energy savings and renewable energy projects partially offset energy unit cost increases.
- ARC Biosciences Collaborative Facility continues the Agency's efforts to renew and sustain its capabilities into fewer, more efficient facilities.
 - 80% facilities have been in place since before 1970. Older facilities are inefficient and not configured to support current mission requirements.
 - Slow pace of renewal – recapitalizes facilities every ~240 years.
- Demolition of unneeded facilities helps reduce the Agency's footprint.
 - Goal is to reduce NASA buildings by 700,000 square feet from FY 2015 to FY 2020.
 - Eliminated 550 assets, \$1.6B (current replacement value) in obsolete and inactive facilities since 2010.
 - NASA is currently demolishing 2.3 square feet for every square foot it replaces.
- CoF and Center Maintenance activities are interrelated
 - An inability to meet maintenance requirements has increased repair needs and contributes to the large backlog of CoF repair projects.
 - The FY 2015 estimated repair backlog is \$2.3B
 - Demolition, replacement of obsolete facilities, and repair of high value assets help reduce this backlog.

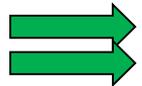


Exploration and Space Operations

Construction of Facilities

Mission Support Directorate

Construction of Facilities (\$ in millions)	FY 2015	FY 2016 Enacted	FY 2017 Request	Outyears are Notional			
				FY 2018	FY 2019	FY 2020	FY 2021
Institutional CoF	\$276.5		\$290.7	\$297.9	\$303.8	\$310.1	\$317.9
Exploration CoF	\$67.9		\$8.8	\$0.0	\$0.0	\$0.0	\$0.0
Space Operations CoF	\$19.3		\$28.5	\$0.0	\$0.0	\$0.0	\$0.0
Grand Total	\$374.4		\$328.0	\$297.9	\$303.8	\$310.1	\$317.9



- Exploration CoF

- Minor construction projects to repair and modernize existing facilities required to meet Exploration program requirements. Planned projects include roof repairs and substation repairs at Michoud and modification of the Turn Basin Wharf at Kennedy Space Center.

- Space Operations CoF

- Continues modernization of the Deep Space Network with construction of two new 34 meter beam wave guide antennas in Madrid. Total project estimate is \$57.8 million (FY 2015 – FY 2019). The construction estimate for the work planned in FY 2017 is \$23 million.
- Minor construction projects to repair and modernize existing facilities required to meet Space Operations program requirements. Planned projects replace the logistics roof at Kennedy Space Center, repair site & improve lighting at Vandenberg Air Force Base, and remediate the apron at the Deep Space Network in Madrid.





Environmental Compliance & Restoration

Mission Support Directorate

\$ in millions	Outyears are Notional						
	FY 2015	FY 2016 Enacted	FY 2017 Request	FY 2018	FY 2019	FY 2020	FY 2021
Environmental Compliance and Restor.	\$71.7		\$91.8	\$92.3	\$94.2	\$95.9	\$96.2

- Cleanup contaminated groundwater, begin soil removal, operate groundwater treatment systems, and continue long term groundwater monitoring at Santa Susana Field Laboratory in accordance with the consent order with the State of California.
- Continue cleanup of ground water contamination and investigation of soil contamination at White Sands Test Facility, to comply with the facility permit issued by the State of New Mexico.
- Continue investigation and cleanup of groundwater and soil contamination at Kennedy Space Center in accordance with State of Florida requirements.
- Operate and maintain systems to clean up contaminated groundwater emanating from Jet Propulsion Laboratory and operate the Lincoln Avenue and Monk Hill drinking water treatment systems.





Mission Support

FY17 Budget Request Summary

Mission Support Directorate

- Implements the long-term alignment of mission support services with our missions, identified in the Business Services Assessment (BSA) of IT, acquisition, human capital management, budget management, and facilities management to optimize services and maintain a minimum set of capabilities to meet mission needs.
- Requires NASA to balance risks across functional areas to provide a safe, reliable infrastructure.
- Prioritizes activities consistent with the improvement opportunities identified through the 2015 Strategic Objective Annual Review:
 - Increases Institutional Construction of Facilities to address critical infrastructure repair and modernization requirements.
 - Reallocates funding to Agency IT Services to consolidate network operations under the Agency CIO.
 - Invests in IT infrastructure and enterprise solutions to modernize systems and optimize delivery of Agency-wide IT services.
 - Integrates, simplifies, and consolidates the IT infrastructure into a more secure, effective, and efficient environment.
- Invests in energy savings projects to reduce utility usage and costs.
- Continues cleanup of current or former sites where NASA operations contributed to environmental problems