



# **The Budget Environment**

**Briefing to the NASA Advisory Committee  
July 28, 2017**

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Acting CFO



## FY 2017 and FY 2018 Appropriations

- FY 2017 CJS appropriations bill enacted 5/5/17 includes \$19.653B for NASA, \$368.3M above the FY 2016 enacted level and \$628M above the FY17 request.
  
- House Committee on Appropriations has moved aggressively to mark up FY 2018 appropriations bills. All 12 appropriations bills now marked up in full Committee.
  - FY 2018 CJS appropriations bill marked up at full Committee on 7/13, with NASA funding recommended at \$19.872B, \$780M above the President's request.
  - Committee bundled four of the 12 annual appropriations bills into a so-called "minibus" —and is being considered on House floor this week before August recess. The package includes the Defense, Energy-Water, Legislative Branch and Military Construction-VA bills.
  - No schedule has yet been set for House floor consideration of the FY 2018 CJS Appropriations bill.
  
- Senate Committee on Appropriations has begun marking up FY 2018 appropriations bills
  - FY 2018 CJS appropriations bill marked up at full Committee on 7/27, with NASA funding recommended at 19.529B, \$124M below the FY17 enacted level and \$437M above the President's FY18 request.



# FY 2018 NASA Appropriations Action to Date

(as of 7/27/17)

	FY 2016 Enacted	FY 2017 Enacted* (5/5/17)	Change from FY 2017 Request	FY 2018 Request	FY 2018 HAC CJS Draft Bill and Report (7/12/17)	Change from FY 2018 Request	FY 2018 SAC CJS Full Committee Mark	Change from FY 2018 Request
<b>NASA TOTAL</b>	<b>19,285.0</b>	<b>19,653.3</b>	<b>628.2</b>	<b>19,092.2</b>	<b>19,871.8</b>	<b>779.6</b>	<b>19,529.3</b>	<b>437.1</b>
<b>Science</b>	<b>5,589.4</b>	<b>5,764.9</b>	<b>164.4</b>	<b>5,711.8</b>	<b>5,858.5</b>	<b>146.7</b>	<b>5,571.8</b>	<b>-140.0</b>
Earth Science	1,921.0	1,921.0	-111.2	1,754.1	1,704.0	-50.1	1,921.0	166.9
Planetary	1,631.0	1,846.0	327.3	1,929.5	2,120.9	191.4	1,611.9	-317.6
<i>Europa</i>	<u>175.0</u>	<u>275.0</u>	<u>225.4</u>	<u>425.0</u>	<u>495.0</u>	<u>70.0</u>		
Astrophysics.	<u>767.6</u>	<u>750.0</u>	-31.5	816.7	822.0	5.3	816.7	0.0
JWST	620.0	569.4	0.0	533.7	533.7	0.0	533.7	0.0
Heliophysics.	649.8	678.5	-20.2	677.8	677.8	0.0	688.5	10.7
<b>Aeronautics</b>	<b>640.0</b>	<b>660.0</b>	<b>-130.4</b>	<b>624.0</b>	<b>660.0</b>	<b>36.0</b>	<b>650.0</b>	<b>26.0</b>
<b>Space Tech</b>	<b>686.5</b>	<b>686.5</b>	<b>-140.2</b>	<b>678.6</b>	<b>686.5</b>	<b>7.9</b>	<b>700.0</b>	<b>21.4</b>
<b>Exploration</b>	<b>4,030.0</b>	<b>4,324.0</b>	<b>987.1</b>	<b>3,934.1</b>	<b>4,550.0</b>	<b>615.9</b>	<b>4,395.0</b>	<b>460.9</b>
Orion	1,270.0	1,350.0	230.2	1,186.0	1,350.0	164.0	1,350.0	164.0
SLS	<u>2,000.0</u>	<u>2,150.0</u>	<u>839.7</u>	<u>1,937.8</u>	<u>2,150.0</u>	<u>212.2</u>	2,150.0	212.2
EGS	410.0	429.0	-0.4	460.4	600.0	139.6	545.0	84.6
ERD	350.0	395.0	-82.3	350.0	450.0	100.0	350.0	0.0
<b>Space Ops</b>	<b>5,029.2</b>	<b>4,950.7</b>	<b>-125.1</b>	<b>4,740.8</b>	<b>4,676.6</b>	<b>-64.2</b>	<b>4,751.5</b>	<b>10.7</b>
Comm Crew	1,243.8	1,184.8	0.0	731.9				
<b>Education</b>	<b>115</b>	<b>100</b>	<b>-0.1</b>	<b>37.3</b>	<b>90</b>	<b>52.7</b>	<b>100</b>	<b>62.7</b>
Space Grant	40	40	16		40	40	40	40
EPSCOR	18	18	9		18	18	18	18
MUREP	32	32	2		32	32	32	32
SEAP	25	10	-27.1				10	10
<b>SSMS</b>	<b>2,768.60</b>	<b>2,768.60</b>	<b>-68.2</b>	<b>2,830.20</b>	<b>2,826.20</b>	<b>-4</b>	<b>2826.9</b>	<b>-3.3</b>
<b>CECR</b>	<b>388.9</b>	<b>360.7</b>	<b>-59.1</b>	<b>496</b>	<b>486.1</b>	<b>-9.9</b>	<b>496.1</b>	
<b>IG</b>	<b>37.4</b>	<b>37.9</b>	<b>-0.2</b>	<b>39.3</b>	<b>37.9</b>	<b>-1.4</b>	<b>38</b>	<b>-1.3</b>

\*FY 2017 enacted total does not include \$74.7M in emergency funds provided in PL 114-254 to partially fund KSC recovery/repair from Hurricane Matthew or \$109M in emergency funds provided in PL 115-31 to fund MAF tornado recovery/repair.

# FY 2018 Budget Request (\$M)



Budget Authority (\$ in millions)	Fiscal Year						
	Actual	Enacted	Request	Notional			
	2016	2017	2018	2019	2020	2021	2022
<b>NASA Total</b>	<b>19,285.0</b>	<b>19,653.3</b>	<b>19,092.2</b>	<b>19,092.2</b>	<b>19,092.2</b>	<b>19,092.2</b>	<b>19,092.2</b>
<b>Science</b>	<b>5,584.1</b>	<b>5,764.9</b>	<b>5,711.8</b>	<b>5,728.7</b>	<b>5,728.7</b>	<b>5,728.7</b>	<b>5,728.7</b>
<b>Earth Science</b>	<b>1,926.6</b>		<b>1,754.1</b>	<b>1,769.1</b>	<b>1,769.1</b>	<b>1,769.1</b>	<b>1,769.1</b>
<b>Planetary Science</b>	<b>1,628.0</b>		<b>1,929.5</b>	<b>1,921.4</b>	<b>1,916.4</b>	<b>1,911.4</b>	<b>1,911.4</b>
<b>Astrophysics</b>	<b>762.4</b>		<b>816.7</b>	<b>1,045.8</b>	<b>1,153.2</b>	<b>1,200.6</b>	<b>1,200.4</b>
<b>James Webb Space Telescope</b>	<b>620.0</b>		<b>533.7</b>	<b>304.6</b>	<b>197.2</b>	<b>149.8</b>	<b>150.0</b>
<b>Heliophysics</b>	<b>647.2</b>		<b>677.8</b>	<b>687.8</b>	<b>692.8</b>	<b>697.8</b>	<b>697.8</b>
<b>Aeronautics</b>	<b>633.8</b>	<b>660.0</b>	<b>624.0</b>	<b>624.4</b>	<b>624.4</b>	<b>624.4</b>	<b>624.4</b>
<b>Space Technology</b>	<b>686.4</b>	<b>686.5</b>	<b>678.6</b>	<b>679.3</b>	<b>679.3</b>	<b>679.3</b>	<b>679.3</b>
<b>Exploration</b>	<b>3,996.2</b>	<b>4,324.0</b>	<b>3,934.1</b>	<b>4,259.7</b>	<b>4,513.3</b>	<b>4,437.9</b>	<b>4,449.9</b>
<b>Exploration Systems Development</b>	<b>3,640.8</b>	<b>3,929.0</b>	<b>3,584.1</b>	<b>3,739.7</b>	<b>3,898.2</b>	<b>3,771.5</b>	<b>3,762.3</b>
<b>Exploration Research and Development</b>	<b>355.4</b>	<b>395.0</b>	<b>350.0</b>	<b>520.0</b>	<b>615.1</b>	<b>666.4</b>	<b>687.6</b>
<b>Space Operations</b>	<b>5,032.3</b>	<b>4,950.7</b>	<b>4,740.8</b>	<b>4,532.8</b>	<b>4,279.2</b>	<b>4,354.6</b>	<b>4,342.6</b>
<b>Space Shuttle</b>	<b>5.4</b>	--	--	--	--	--	--
<b>International Space Station</b>	<b>1,436.4</b>	--	<b>1,490.6</b>	<b>1,561.3</b>	<b>1,611.4</b>	<b>1,616.5</b>	<b>1,635.2</b>
<b>Space Transportation</b>	<b>2,667.8</b>	--	<b>2,415.1</b>	<b>2,118.7</b>	<b>1,811.4</b>	<b>1,868.6</b>	<b>1,808.9</b>
<b>Space and Flight Support (SFS)</b>	<b>922.7</b>	--	<b>835.0</b>	<b>852.7</b>	<b>856.4</b>	<b>869.4</b>	<b>898.5</b>
<b>Education</b>	<b>115.0</b>	<b>100.0</b>	<b>37.3</b>	--	--	--	--
<b>Safety, Security, and Mission Services</b>	<b>2,772.4</b>	<b>2,768.6</b>	<b>2,830.2</b>	<b>2,859.4</b>	<b>2,859.4</b>	<b>2,859.4</b>	<b>2,859.4</b>
<b>Center Management and Operations</b>	<b>1,987.6</b>	--	<b>1,992.5</b>	<b>2,036.8</b>	<b>2,036.8</b>	<b>2,036.8</b>	<b>2,036.8</b>
<b>Agency Management and Operations</b>	<b>784.8</b>	--	<b>837.7</b>	<b>822.6</b>	<b>822.6</b>	<b>822.6</b>	<b>822.6</b>
<b>Construction and Environmental Compliance and Restoration</b>	<b>427.4</b>	<b>360.7</b>	<b>496.1</b>	<b>368.6</b>	<b>368.6</b>	<b>368.6</b>	<b>368.6</b>
<b>Construction of Facilities</b>	<b>352.9</b>	--	<b>408.2</b>	<b>280.7</b>	<b>280.7</b>	<b>280.7</b>	<b>280.7</b>
<b>Environmental Compliance and Restoration</b>	<b>74.5</b>	--	<b>87.9</b>	<b>87.9</b>	<b>87.9</b>	<b>87.9</b>	<b>87.9</b>
<b>Inspector General</b>	<b>37.4</b>	<b>37.9</b>	<b>39.3</b>	<b>39.3</b>	<b>39.3</b>	<b>39.3</b>	<b>39.3</b>
<b>NASA Total</b>	<b>19,285.0</b>	<b>19,653.3</b>	<b>19,092.2</b>	<b>19,092.2</b>	<b>19,092.2</b>	<b>19,092.2</b>	<b>19,092.2</b>

FY 2016 reflects funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016, as executed under the Agency's current FY 2016 Operating Plan.

FY 2017 Enacted reflects the funding amounts specified in Division B of the Consolidated Appropriations Act, 2017, P.L. 115-31. Table does not reflect emergency supplemental funds also appropriated in FY 2017, totaling \$184 million.

In the outyears, Human Exploration and Operations is held flat at the combined level of the Exploration and Space Operations accounts.

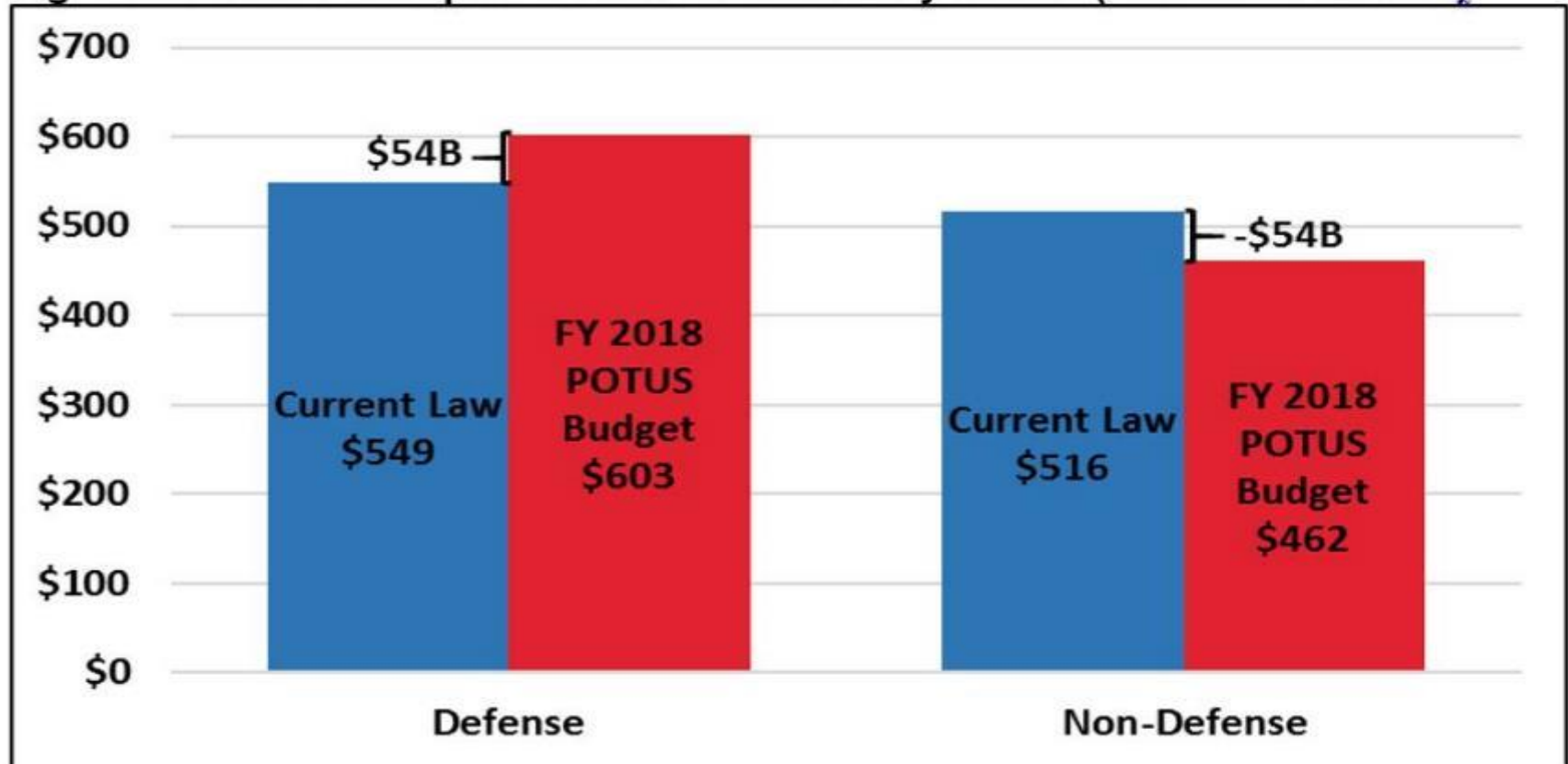
# Federal Context



The Budget Control Act of 2011 caps total discretionary spending at **\$1.065 trillion** for FY 2018

- FY 2018 cap is \$5 billion less than FY 2017
- President's FY 2018 budget request proposes to reallocate \$54 billion from non-defense discretionary (-10.5%) to defense (+9.8%) (requires change in law).
- House Budget Committee/House Appropriations Committee marks assume \$622B for defense and \$511B for non-defense spending.
- Projected total federal spending is projected to be **\$3.76 trillion**

**Fig. 1: President Trump's FY 2018 Discretionary Levels (Billions of Dollars)**

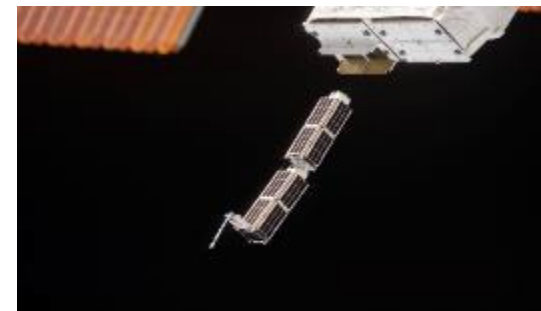


Sources: Office of Management and Budget, Congressional Budget Office

# 2018 Budget Highlights



- Provides \$19.1 billion to increase understanding of the universe and our place in it, advance America's world-leading aerospace technology, inspire the Nation, and open the space frontier.
- Increases cooperation with industry through public-private partnerships, focuses the Nation's efforts on deep space exploration rather than Earth-centric research, and develops technologies that would help achieve U.S. space goals and benefit the economy.
- Continues leadership in driving commercial partnerships, which has enabled us to turn over cargo resupply services for the International Space Station (ISS) to American industry and is building toward the imminent return of the capability to launch astronauts from American soil.





# Highlights *(continued)*



- Maintains commitment to studying our home planet and the universe
- Enables our wide ranging science work on many fronts, which continues to lead the world in its size, scope, and scientific output.
- Reinvigorates robotic exploration of the solar system, including funding for a Europa Clipper mission to fly repeatedly by Jupiter's icy ocean moon Europa.
- Maintains a robust Earth Science program while terminating several missions.
- Supports initiatives that use smaller, less expensive satellites and/or public-private partnerships to advance science, in keeping with recent National Academies recommendations.







# Anticipated Accomplishments in FY 2018



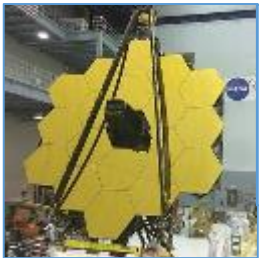
Advanced Exploration Systems  
Develop prototype habitats for space exploration through public-private partnerships



Commercial Crew  
First Commercial Crew Post Certification Mission planned for September 2018



Exploration Systems  
Continuing systems integration in preparation for the EM-1 launch



James Webb Space Telescope  
Completes its assembly and testing, and ships for launch in October 2018.



X-57 Flights  
Conduct flight tests of a new distributed electric propulsion system



Space Technology  
Completes Laser Comm hardware build, and launches and demos Green Propellant and Deep Space Atomic Clock.



Science Launches in 2018  
ICON, GRACE-FO, InSight, ICESat-2, TESS, and SPP

# NASA Mission Launches (Fiscal Years 2017 – 2022)



	NASA Mission on US ELV		Exploration Systems Development Mission
	Reimbursable Mission for NOAA **** NASA does not directly manage/control JASD missions. LRDs reflected are to the best of our knowledge		Commercial Crew Mission
	Joint NASA-Int'l Partner Mission		Commercial Resupply Services Mission
	Int'l Mission with NASA contribution		Future Commercial Resupply Mission
	Joint NASA-USAF Mission		Aeronautics Mission

ARMD missions in blue text  
HEOMD missions in white text  
SMD missions in black text  
STMD missions in yellow text

✓ Mission successfully launched  
X Mission unsuccessful

\*\* Ground-based elements (includes suborbital) block of 5 missions  
+ Future CRS Capabilities unknown, will be updated after award of CRS-2 when cargo delivery capabilities are known  
\*\*\* Instrument only

FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
JPSS-1	GOES-S	Comm Crew	Comm Crew	Low Boom Flight Demonstrator	Comm Crew
✓ GOES-R	InSight	Comm Crew	Comm Crew	Comm Crew	Comm Crew
✓ CYGNSS	GOLD***	Metop-C***	GOES-T	Helio Expl MoO-1***	JPSS-2
✓ SAGE-III***	ICON	BepiColombo***	Mars-2020	MAIA MoO***	JUICE***
NICER***	SPP	Solar Orb***	ExoMars Rover***	TROPICS MoO***	Psyche
ISS-CREAM	TSIS-1 MoO***	GEDI MoO***	Future Cargo+	EVS-3**	Lucy
SpaceX-12 CRS	GRACE FO	ECOSTRESS MoO***	Future Cargo+	GeoCarb	LWS-MoO-4***
SpaceX-11 CRS	ICESat-2	EVS-2**	Future Cargo+	Astro MoO-1***	STP MoO-3***
✓ SpaceX-10 CRS	TESS	JWST	Future Cargo+	IXPE	Helio Expl MoO-2***
Orbital ATK-8 CRS	SpaceX-15 CRS	SpaceX-19 CRS	SpaceX-20 CRS	Euclid***	TEMPO MoO***
✓ Orbital ATK-7 CRS	SpaceX-14 CRS	SpaceX-18 CRS	Ascent Abort-2	Future Cargo+	OMPS-L***
✓ Orbital ATK-5 CRS	SpaceX-13 CRS	SpaceX-17 CRS	TDM LCRD	Future Cargo+	NI-SAR
TDRS-M	Orbital ATK-9 CRS	SpaceX-16 CRS	TDM TRN	Future Cargo+	Sentinel-6a
TDM GPIM	CCtCap DM-2 - SpaceX flight test w/ crew	Orbital ATK-11 CRS	TDM MOXIE	Future Cargo+	SWOT
TDM DSAC	CCtCap DM-1 - SpaceX flight test w/o crew	Orbital ATK-10 CRS	GCD MEDLI2	Future Cargo+	Landsat-9
GCD SEXTANT	CCtCap - Boeing crewed flight test	EM-1	GCD MEDA	Future Cargo+	Future Cargo+
	CCtCap - Boeing orbital flight test	TDM e-Cryo		Future Cargo+	Future Cargo+
	TDM IRMA			Future Cargo+	Future Cargo+
				Future Cargo+	EM-2 Crew (EUS) Power/Prop Bus
					TDM-High Mass Entry Descent/Landing
					TDM Satellite Servicing
					TDM SEP
					TDM DSOC

*Notional*

Dates reflect Agency Baseline Commitments or updated Agency schedules and may include schedule margin beyond any manifested launch dates



# Agency Reform Plan

The White House  
Office of the Press Secretary  
For Immediate Release January 23, 2017

## Presidential Memorandum Regarding the Hiring Freeze

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Hiring Freeze

By the authority vested in me as President by the Constitution and the laws of the United States of America, I hereby order a freeze on the hiring of Federal civilian employees to be applied across the board in the executive branch. As part of this freeze, no vacant positions existing at noon on January 22, 2017, may be filled and no new positions may be created, except in limited circumstances. This order does not include or apply to military personnel. The head of any executive department or agency may exempt from the hiring freeze any positions that it deems necessary to meet national security or public safety responsibilities. In addition, the Director of the Office of Personnel Management (OPM) may grant exemptions from this freeze where those exemptions are otherwise necessary.

Within 90 days of the date of this memorandum, the Director of the Office of Management and Budget (OMB), in consultation with the Director of OPM, shall recommend a long-term plan to reduce the size of the Federal Government's workforce through attrition. This order shall expire upon implementation of the OMB plan.

January 23

The White House  
Office of the Press Secretary  
For Immediate Release March 13, 2017

## Presidential Executive Order on a Comprehensive Plan for Reorganizing the Executive Branch

EXECUTIVE ORDER

COMPREHENSIVE PLAN FOR REORGANIZING THE EXECUTIVE BRANCH

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:


Section 1. Purpose. This order is intended to improve the efficiency, effectiveness, and accountability of the executive branch by directing the Director of the Office of Management and Budget (Director) to propose a plan to reorganize governmental functions and eliminate unnecessary agencies (as defined in section 551(1) of title 5, United States Code), components of agencies, and agency programs.

Sec. 2. Proposed Plan to Improve the Efficiency, Effectiveness, and Accountability of Federal Agencies, Including, as Appropriate, to Eliminate or Reorganize Unnecessary or Redundant Federal Agencies. (a) Within 180 days of the date of this order, the head of each agency shall submit to the Director a proposed plan to reorganize the agency, if appropriate, in order to improve the efficiency, effectiveness, and accountability of that agency.

March 13

## America First

### A Budget Blueprint to Make America Great Again



Office of Management and Budget

March 16

April 12

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
WASHINGTON, D.C. 20503

THE DIRECTOR April 12, 2017

M-17-21

MEMORANDUM FOR HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Mick Mulvaney, Director

SUBJECT: Comprehensive Plan for Reforming the Federal Government and Reducing the Federal Civilian Workforce

**I. Purpose and Scope**

Despite growing citizen dissatisfaction with the cost and performance of the Federal government, Washington often crafts costly solutions in search of a problem. Too often the focus has been on creating new programs instead of eliminating or reforming programs which are no longer operating effectively. The result has been too many overlapping and outdated programs, rules, and processes, and too many Federal employees stuck in a system that is not working for the American people. Through the actions described below, President Trump aims to make government lean, accountable, and more efficient.

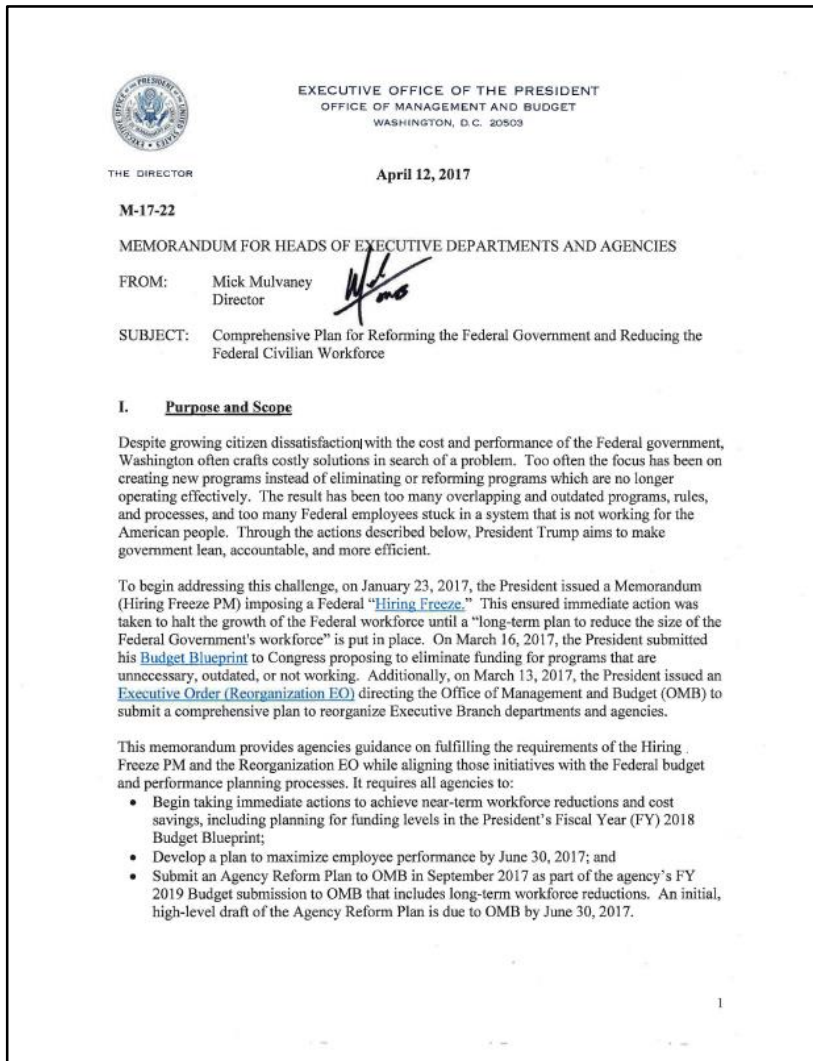
To begin addressing this challenge, on January 23, 2017, the President issued a Memorandum (Hiring Freeze PM) imposing a Federal "Hiring Freeze." This ensured immediate action was taken to halt the growth of the Federal workforce until a long-term plan to reduce the size of the Federal Government's workforce is put in place. On March 16, 2017, the President submitted his Budget Blueprint to Congress proposing to eliminate funding for programs that are unnecessary, outdated, or not working. Additionally, on March 13, 2017, the President issued an Executive Order (Reorganization EO) directing the Office of Management and Budget (OMB) to submit a comprehensive plan to reorganize Executive Branch departments and agencies.

This memorandum provides agencies guidance on fulfilling the requirements of the Hiring Freeze PM and the Reorganization EO while aligning those initiatives with the Federal budget and performance planning processes. It requires all agencies to:

- Begin taking immediate actions to achieve near-term workforce reductions and cost savings, including planning for funding levels in the President's Fiscal Year (FY) 2018 Budget Blueprint;
- Develop a plan to maximize employee performance by June 30, 2017; and
- Submit an Agency Reform Plan to OMB in September 2017 as part of the agency's FY 2019 Budget submission to OMB that includes long-term workforce solutions. An initial, high-level draft of the Agency Reform Plan is due to OMB by June 30, 2017.



# OMB Guidance



- This guidance describes specific actions that OMB and agencies will be taking to chart the course for a lean, more effective, efficient, and accountable government.
- The guidance requires all agencies to:
  - Begin taking immediate actions to achieve near-term workforce reductions and cost savings, including planning for funding levels in the President's Fiscal Year (FY) 2018 Budget Blueprint;
  - Develop a plan to maximize employee performance and a high-level draft of an Agency Reform Plan by June 30, 2017; and
  - Submit an Agency Reform Plan to OMB in September 2017 as part of the agency's FY 2019 Budget submission to OMB that includes long-term workforce reductions.



**QUESTIONS?**