

114TH CONGRESS  
1ST SESSION

# H. R. 2039

To authorize the programs of the National Aeronautics and Space  
Administration, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

APRIL 28, 2015

Mr. PALAZZO (for himself, Mr. SMITH of Texas, Mr. CULBERSON, Mr. LUCAS, Mr. BRIDENSTINE, Mr. WEBER of Texas, Mr. LOUDERMILK, Mr. ROHRABACHER, Mr. MCCAUL, Mr. HULTGREN, Mr. MOOLENAAR, Mr. KNIGHT, Mr. BABIN, Mrs. COMSTOCK, Mr. BROOKS of Alabama, Mr. JOHNSON of Ohio, and Mr. POSEY) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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## A BILL

To authorize the programs of the National Aeronautics and  
Space Administration, and for other purposes.

1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*

3       **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4       (a) SHORT TITLE.—This Act may be cited as the  
5       “National Aeronautics and Space Administration Author-  
6       ization Act for 2016 and 2017”.

7       (b) TABLE OF CONTENTS.—The table of contents for  
8       this Act is as follows:

- Sec. 1. Short title; table of contents.
- Sec. 2. Definitions.

## TITLE I—AUTHORIZATION OF APPROPRIATIONS

- Sec. 101. Fiscal year 2016.
- Sec. 102. Fiscal year 2017.
- Sec. 103. Budget control.

## TITLE II—HUMAN SPACE FLIGHT

### Subtitle A—Exploration

- Sec. 201. Space exploration policy.
- Sec. 202. Stepping stone approach to exploration.
- Sec. 203. Space Launch System.
- Sec. 204. Orion crew vehicle.
- Sec. 205. Space radiation.
- Sec. 206. Planetary protection for human exploration missions.

### Subtitle B—Space Operations

- Sec. 211. International Space Station.
- Sec. 212. Barriers impeding enhanced utilization of the ISS's National Laboratory by commercial companies.
- Sec. 213. Utilization of International Space Station for science missions.
- Sec. 214. International Space Station cargo resupply services lessons learned.
- Sec. 215. Commercial crew program.
- Sec. 216. Space communications.

## TITLE III—SCIENCE

### Subtitle A—General

- Sec. 301. Science portfolio.
- Sec. 302. Radioisotope power systems.
- Sec. 303. Congressional declaration of policy and purpose.
- Sec. 304. University class science missions.
- Sec. 305. Assessment of science mission extensions.

### Subtitle B—Astrophysics

- Sec. 311. Decadal cadence.
- Sec. 312. Extrasolar planet exploration strategy.
- Sec. 313. James Webb Space Telescope.
- Sec. 314. National Reconnaissance Office telescope donation.
- Sec. 315. Wide-Field Infrared Survey Telescope.
- Sec. 316. Stratospheric Observatory for Infrared Astronomy.

### Subtitle C—Planetary Science

- Sec. 321. Decadal cadence.
- Sec. 322. Near-Earth objects.
- Sec. 323. Near-Earth objects public-private partnerships.
- Sec. 324. Research on near-Earth object tsunami effects.
- Sec. 325. Astrobiology strategy.
- Sec. 326. Astrobiology public-private partnerships.
- Sec. 327. Assessment of Mars architecture.

### Subtitle D—Heliophysics

- Sec. 331. Decadal cadence.
- Sec. 332. Review of space weather.

### Subtitle E—Earth Science

- Sec. 341. Goal.
- Sec. 342. Decadal cadence.
- Sec. 343. Venture class missions.
- Sec. 344. Assessment.

## TITLE IV—AERONAUTICS

- Sec. 401. Sense of Congress.
- Sec. 402. Aeronautics research goals.
- Sec. 403. Unmanned aerial systems research and development.
- Sec. 404. Research program on composite materials used in aeronautics.
- Sec. 405. Hypersonic research.
- Sec. 406. Supersonic research.
- Sec. 407. Research on NextGen airspace management concepts and tools.
- Sec. 408. Rotorcraft research.
- Sec. 409. Transformative aeronautics research.
- Sec. 410. Study of United States leadership in aeronautics research.

## TITLE V—SPACE TECHNOLOGY

- Sec. 501. Sense of Congress.
- Sec. 502. Space Technology Program.
- Sec. 503. Utilization of the International Space Station for technology demonstrations.

## TITLE VI—EDUCATION

- Sec. 601. Education.
- Sec. 602. Independent review of the National Space Grant College and Fellowship Program.
- Sec. 603. Sense of Congress.

## TITLE VII—POLICY PROVISIONS

- Sec. 701. Asteroid Retrieval Mission.
- Sec. 702. Termination liability sense of Congress.
- Sec. 703. Baseline and cost controls.
- Sec. 704. Project and program reserves.
- Sec. 705. Independent reviews.
- Sec. 706. Commercial technology transfer program.
- Sec. 707. National Aeronautics and Space Administration Advisory Council.
- Sec. 708. Cost estimation.
- Sec. 709. Avoiding organizational conflicts of interest in major Administration acquisition programs.
- Sec. 710. Facilities and infrastructure.
- Sec. 711. Detection and avoidance of counterfeit electronic parts.
- Sec. 712. Space Act Agreements.
- Sec. 713. Human spaceflight accident investigations.
- Sec. 714. Full commercial use of space.
- Sec. 715. Orbital debris.
- Sec. 716. Review of orbital debris removal concepts.

- Sec. 717. Use of operational commercial suborbital vehicles for research, development, and education.
- Sec. 718. Fundamental space life and physical sciences research.
- Sec. 719. Restoring commitment to engineering research.
- Sec. 720. Liquid rocket engine development program.
- Sec. 721. Remote satellite servicing demonstrations.
- Sec. 722. Information technology governance.
- Sec. 723. Strengthening Administration security.
- Sec. 724. Prohibition on use of funds for contractors that have committed fraud or other crimes.
- Sec. 725. Protection of Apollo landing sites.
- Sec. 726. Astronaut occupational healthcare.
- Sec. 727. Sense of Congress on access to observational data sets.

## 1 **SEC. 2. DEFINITIONS.**

2 In this Act:

3 (1) ADMINISTRATION.—The term “Administra-  
4 tion” means the National Aeronautics and Space  
5 Administration.

6 (2) ADMINISTRATOR.—The term “Adminis-  
7 trator” means the Administrator of the Administra-  
8 tion.

9 (3) ORION CREW VEHICLE.—The term “Orion  
10 crew vehicle” means the multipurpose crew vehicle  
11 described in section 303 of the National Aeronautics  
12 and Space Administration Authorization Act of 2010  
13 (42 U.S.C. 18323).

14 (4) SPACE ACT AGREEMENT.—The term “Space  
15 Act Agreement” means an agreement created under  
16 the authority to enter into “other transactions”  
17 under section 20113(e) of title 51, United States  
18 Code.

1           (5) SPACE LAUNCH SYSTEM.—The term “Space  
 2       Launch System” means the follow-on Government-  
 3       owned civil launch system developed, managed, and  
 4       operated by the Administration to serve as a key  
 5       component to expand human presence beyond low-  
 6       Earth orbit, as described in section 302 of the Na-  
 7       tional Aeronautics and Space Administration Au-  
 8       thorization Act of 2010 (42 U.S.C. 18322).

## 9       **TITLE I—AUTHORIZATION OF** 10       **APPROPRIATIONS**

### 11   **SEC. 101. FISCAL YEAR 2016.**

12       Except as provided in section 103, there are author-  
 13       ized to be appropriated to the Administration for fiscal  
 14       year 2016 \$18,529,100,000 as follows:

15           (1) For Space Exploration, \$4,953,100,000, of  
 16       which—

17                   (A) \$1,700,000,000 shall be for the Space  
 18       Launch System;

19                   (B) \$410,100,000 shall be for Exploration  
 20       Ground Systems;

21                   (C) \$1,200,000,000 shall be for the Orion  
 22       crew vehicle;

23                   (D) \$399,200,000 shall be for Exploration  
 24       Research and Development; and

1 (E) \$1,243,800,000 shall be for Commer-  
2 cial Crew Development activities.

3 (2) For Space Operations, \$3,992,500,000.

4 (3) For Science, \$4,951,700,000, of which—

5 (A) \$1,450,000,000 shall be for Earth  
6 Science;

7 (B) \$1,500,000,000 shall be for Planetary  
8 Science, with up to \$30,000,000 for the  
9 Astrobiology Institute;

10 (C) \$730,700,000 shall be for Astro-  
11 physics;

12 (D) \$620,000,000 shall be for the James  
13 Webb Space Telescope; and

14 (E) \$651,000,000 shall be for  
15 Heliophysics.

16 (4) For Aeronautics, \$571,400,000.

17 (5) For Space Technology, \$596,000,000.

18 (6) For Education, \$119,000,000.

19 (7) For Safety, Security, and Mission Services,  
20 \$2,843,100,000.

21 (8) For Construction and Environmental Com-  
22 pliance and Restoration, \$465,300,000.

23 (9) For Inspector General, \$37,000,000.

1 **SEC. 102. FISCAL YEAR 2017.**

2 Except as provided in section 103, there are author-  
3 ized to be appropriated to the Administration for fiscal  
4 year 2017 \$18,807,000,000 as follows:

5 (1) For Space Exploration, \$5,268,000,000, of  
6 which—

7 (A) \$1,899,600,000 shall be for the Space  
8 Launch System;

9 (B) \$432,300,000 shall be for Exploration  
10 Ground Systems;

11 (C) \$1,349,600,000 shall be for the Orion  
12 crew vehicle;

13 (D) \$401,700,000 shall be for Exploration  
14 Research and Development; and

15 (E) \$1,184,800,000 shall be for Commer-  
16 cial Crew Development activities.

17 (2) For Space Operations, \$3,992,500,000.

18 (3) For Science, \$4,935,300,000, of which—

19 (A) \$1,450,000,000 shall be for Earth  
20 Science;

21 (B) \$1,500,000,000 shall be for Planetary  
22 Science, with up to \$30,000,000 for the  
23 Astrobiology Institute;

24 (C) \$730,700,000 shall be for Astro-  
25 physics;

1 (D) \$569,400,000 shall be for the James  
2 Webb Space Telescope; and

3 (E) \$685,200,000 shall be for  
4 Heliophysics.

5 (4) For Aeronautics, \$580,000,000.

6 (5) For Space Technology, \$596,000,000.

7 (6) For Education, \$119,000,000.

8 (7) For Safety, Security, and Mission Services,  
9 \$2,843,100,000.

10 (8) For Construction and Environmental Com-  
11 pliance and Restoration, \$436,100,000.

12 (9) For Inspector General, \$37,000,000.

13 **SEC. 103. BUDGET CONTROL.**

14 (a) IN GENERAL.—Except as provided in subsection  
15 (b), if the applicable limits for discretionary, nonsecurity  
16 purposes contained in section 251(c) of the Balanced  
17 Budget and Emergency Deficit Control Act of 1985 are  
18 not repealed, replaced, or modified to account for in-  
19 creased allocations, and if increased allocations do not oth-  
20 erwise become available through corresponding offsets  
21 from within such limits, there are authorized to be appro-  
22 priated to the Administration for each of fiscal years 2016  
23 and 2017 \$18,010,200,000 as follows:

24 (1) For Space Exploration, \$4,845,400,000, of  
25 which—



1 (A) \$1,700,000,000 shall be for the Space  
2 Launch System;

3 (B) \$410,100,000 shall be for Exploration  
4 Ground Systems;

5 (C) \$1,200,000,000 shall be for the Orion  
6 crew vehicle;

7 (D) \$399,200,000 shall be for Exploration  
8 Research and Development; and

9 (E) \$1,136,100,000 shall be for Commer-  
10 cial Crew Development activities.

11 (2) For Space Operations, \$3,950,400,000.

12 (3) For Science, \$4,678,600,000, of which—

13 (A) \$1,198,500,000 shall be for Earth  
14 Science;

15 (B) \$1,500,000,000 shall be for Planetary  
16 Science, with up to \$30,000,000 for the  
17 Astrobiology Institute;

18 (C) \$709,100,000 shall be for Astro-  
19 physics;

20 (D) \$620,000,000 shall be for the James  
21 Webb Space Telescope; and

22 (E) \$651,000,000 shall be for  
23 Heliophysics.

24 (4) For Aeronautics, \$571,400,000.

25 (5) For Space Technology, \$500,000,000.

1 (6) For Education, \$119,000,000.

2 (7) For Safety, Security, and Mission Services,  
3 \$2,843,100,000.

4 (8) For Construction and Environmental Com-  
5 pliance and Restoration, \$465,300,000.

6 (9) For Inspector General, \$37,000,000.

7 (b) EXCEPTION.—If increased allocations described  
8 in subsection (a) become available in an amount that is  
9 not sufficient to accommodate the authorization levels  
10 specified in sections 101 and 102, there are authorized  
11 to be appropriated to the Administration for each of fiscal  
12 years 2016 and 2017 the amounts that such increased al-  
13 locations do accommodate. Any increases in authorizations  
14 under this subsection above the amounts specified in sub-  
15 section (a) shall be allocated proportionately among the  
16 accounts specified in this title, except that in no event  
17 shall an authorized amount exceed any amount specified  
18 in section 101 or 102.

19 **TITLE II—HUMAN SPACE FLIGHT**  
20 **Subtitle A—Exploration**

21 **SEC. 201. SPACE EXPLORATION POLICY.**

22 (a) POLICY.—Human exploration deeper into the  
23 Solar System shall be a core mission of the Administra-  
24 tion. It is the policy of the United States that the goal  
25 of the Administration’s exploration program shall be to

1 successfully conduct a crewed mission to the surface of  
2 Mars to begin human exploration of that planet. The use  
3 of the surface of the Moon, cis-lunar space, near-Earth  
4 asteroids, Lagrangian points, and Martian moons may be  
5 pursued provided they are properly incorporated into the  
6 Human Exploration Roadmap described in section 70504  
7 of title 51, United States Code.

8 (b) VISION FOR SPACE EXPLORATION.—Section  
9 20302 of title 51, United States Code, is amended by add-  
10 ing at the end the following:

11 “(c) DEFINITIONS.—In this section:

12 “(1) ORION CREW VEHICLE.—The term ‘Orion  
13 crew vehicle’ means the multipurpose crew vehicle  
14 described in section 303 of the National Aeronautics  
15 and Space Administration Authorization Act of 2010  
16 (42 U.S.C. 18323).

17 “(2) SPACE LAUNCH SYSTEM.—The term  
18 ‘Space Launch System’ means the follow-on Govern-  
19 ment-owned civil launch system developed, managed,  
20 and operated by the Administration to serve as a  
21 key component to expand human presence beyond  
22 low-Earth orbit, as described in section 302 of the  
23 National Aeronautics and Space Administration Au-  
24 thorization Act of 2010 (42 U.S.C. 18322).”.

1 (c) KEY OBJECTIVES.—Section 202(b) of the Na-  
2 tional Aeronautics and Space Administration Authoriza-  
3 tion Act of 2010 (42 U.S.C. 18312(b)) is amended—

4 (1) in paragraph (3), by striking “and” after  
5 the semicolon;

6 (2) in paragraph (4), by striking the period at  
7 the end and inserting “; and”; and

8 (3) by adding at the end the following:

9 “(5) to accelerate the development of capabili-  
10 ties to enable a human exploration mission to the  
11 surface of Mars and beyond through the  
12 prioritization of those technologies and capabilities  
13 best suited for such a mission in accordance with the  
14 Human Exploration Roadmap under section 70504  
15 of title 51, United States Code.”.

16 (d) USE OF NON-UNITED STATES HUMAN SPACE  
17 FLIGHT TRANSPORTATION CAPABILITIES.—Section  
18 201(a) of the National Aeronautics and Space Administra-  
19 tion Authorization Act of 2010 (42 U.S.C. 18311(a)) is  
20 amended to read as follows:

21 “(a) USE OF NON-UNITED STATES HUMAN SPACE  
22 FLIGHT TRANSPORTATION CAPABILITIES.—

23 “(1) IN GENERAL.—NASA may not obtain non-  
24 United States human space flight capabilities unless  
25 no domestic commercial or public-private partnership

1 provider that the Administrator has determined to  
2 meet safety and affordability requirements estab-  
3 lished by NASA for the transport of its astronauts  
4 is available to provide such capabilities.

5 “(2) DEFINITION.—For purposes of this sub-  
6 section, the term ‘domestic commercial provider’  
7 means a person providing space transportation serv-  
8 ices or other space-related activities, the majority  
9 control of which is held by persons other than a  
10 Federal, State, local, or foreign government, foreign  
11 company, or foreign national.”.

12 (e) REPEAL OF SPACE SHUTTLE CAPABILITY ASSUR-  
13 ANCE.—Section 203 of the National Aeronautics and  
14 Space Administration Authorization Act of 2010 (42  
15 U.S.C. 18313) is amended—

16 (1) by striking subsection (b);

17 (2) in subsection (d), by striking “subsection  
18 (c)” and inserting “subsection (b)”; and

19 (3) by redesignating subsections (c) and (d) as  
20 subsections (b) and (c), respectively.

21 **SEC. 202. STEPPING STONE APPROACH TO EXPLORATION.**

22 (a) IN GENERAL.—Section 70504 of title 51, United  
23 States Code, is amended to read as follows:

1 **“§ 70504. Stepping stone approach to exploration**

2       “(a) IN GENERAL.—In order to maximize the cost  
3 effectiveness of the long-term space exploration and utili-  
4 zation activities of the United States, the Administrator  
5 shall direct the Human Exploration and Operations Mis-  
6 sion Directorate, or its successor division, to develop a  
7 Human Exploration Roadmap to define the specific capa-  
8 bilities and technologies necessary to extend human pres-  
9 ence to the surface of Mars and the sets and sequences  
10 of missions required to demonstrate such capabilities and  
11 technologies.

12       “(b) INTERNATIONAL PARTICIPATION.—The Presi-  
13 dent should invite the United States partners in the Inter-  
14 national Space Station program and other nations, as ap-  
15 propriate, to participate in an international initiative  
16 under the leadership of the United States to achieve the  
17 goal of successfully conducting a crewed mission to the  
18 surface of Mars.

19       “(c) ROADMAP REQUIREMENTS.—In developing the  
20 Human Exploration Roadmap, the Administrator shall—

21               “(1) include the specific set of capabilities and  
22 technologies that contribute to extending human  
23 presence to the surface of Mars and the sets and se-  
24 quences of missions necessary to demonstrate the  
25 proficiency of these capabilities and technologies  
26 with an emphasis on using or not using the Inter-

1 national Space Station, lunar landings, cis-lunar  
2 space, trans-lunar space, Lagrangian points, and the  
3 natural satellites of Mars, Phobos and Deimos, as  
4 testbeds, as necessary, and shall include the most  
5 appropriate process for developing such capabilities  
6 and technologies;

7 “(2) include information on the phasing of  
8 planned intermediate destinations, Mars mission risk  
9 areas and potential risk mitigation approaches, tech-  
10 nology requirements and phasing of required tech-  
11 nology development activities, the management strat-  
12 egy to be followed, related International Space Sta-  
13 tion activities, and planned international collabo-  
14 rative activities, potential commercial contributions,  
15 and other activities relevant to the achievement of  
16 the goal established in section 201(a) of the Na-  
17 tional Aeronautics and Space Administration Au-  
18 thorization Act for 2016 and 2017;

19 “(3) describe those technologies already under  
20 development across the Federal Government or by  
21 nongovernment entities which meet or exceed the  
22 needs described in paragraph (1);

23 “(4) provide a specific process for the evolution  
24 of the capabilities of the fully integrated Orion crew  
25 vehicle with the Space Launch System and how

1       these systems demonstrate the capabilities and tech-  
2       nologies described in paragraph (1);

3           “(5) provide a description of the capabilities  
4       and technologies that need to be demonstrated or re-  
5       search data that could be gained through the utiliza-  
6       tion of the International Space Station and the sta-  
7       tus of the development of such capabilities and tech-  
8       nologies;

9           “(6) describe a framework for international co-  
10      operation in the development of all technologies and  
11      capabilities required in this section, as well as an as-  
12      sessment of the risks posed by relying on inter-  
13      national partners for capabilities and technologies on  
14      the critical path of development;

15          “(7) describe a process for utilizing nongovern-  
16      mental entities for future human exploration beyond  
17      lunar landings and cis-lunar space and specify what,  
18      if any, synergy could be gained from—

19           “(A) partnerships using Space Act Agree-  
20      ments (as defined in section 2 of the National  
21      Aeronautics and Space Administration Author-  
22      ization Act for 2016 and 2017); or

23           “(B) other acquisition instruments;

24          “(8) include in the Human Exploration Road-  
25      map an addendum from the National Aeronautics



1 and Space Administration Advisory Council, and an  
2 addendum from the Aerospace Safety Advisory  
3 Panel, each with a statement of review of the  
4 Human Exploration Roadmap that shall include—

5 “(A) subjects of agreement;

6 “(B) areas of concern; and

7 “(C) recommendations; and

8 “(9) include in the Human Exploration Road-  
9 map an examination of the benefits of utilizing cur-  
10 rent Administration launch facilities for trans-lunar  
11 missions.

12 “(d) UPDATES.—The Administrator shall update  
13 such Human Exploration Roadmap as needed but no less  
14 frequently than every 2 years and include it in the budget  
15 for that fiscal year transmitted to Congress under section  
16 1105(a) of title 31, and describe—

17 “(1) the achievements and goals reached in the  
18 process of developing such capabilities and tech-  
19 nologies during the 2-year period prior to the sub-  
20 mission of the update to Congress; and

21 “(2) the expected goals and achievements in the  
22 following 2-year period.

23 “(e) DEFINITIONS.—In this section, the terms ‘Orion  
24 crew vehicle’ and ‘Space Launch System’ have the mean-  
25 ings given such terms in section 20302.”.

1 (b) REPORT.—

2 (1) IN GENERAL.—Not later than 180 days  
3 after the date of enactment of this Act, the Adminis-  
4 trator shall transmit a copy of the Human Explo-  
5 ration Roadmap developed under section 70504 of  
6 title 51, United States Code, to the Committee on  
7 Science, Space, and Technology of the House of  
8 Representatives and the Committee on Commerce,  
9 Science, and Transportation of the Senate.

10 (2) UPDATES.—The Administrator shall trans-  
11 mit a copy of each updated Human Exploration  
12 Roadmap to the Committee on Science, Space, and  
13 Technology of the House of Representatives and the  
14 Committee on Commerce, Science, and Transpor-  
15 tation of the Senate not later than 7 days after such  
16 Human Exploration Roadmap is updated.

17 **SEC. 203. SPACE LAUNCH SYSTEM.**

18 (a) FINDINGS.—Congress finds that—

19 (1) the Space Launch System is the most prac-  
20 tical approach to reaching the Moon, Mars, and be-  
21 yond, and Congress reaffirms the policy and min-  
22 imum capability requirements for the Space Launch  
23 System contained in section 302 of the National  
24 Aeronautics and Space Administration Authorization  
25 Act of 2010 (42 U.S.C. 18322);

1           (2) the primary goal for the design of the fully  
2           integrated Space Launch System, including an  
3           upper stage needed to go beyond low-Earth orbit, is  
4           to safely carry a total payload to enable human  
5           space exploration of the Moon, Mars, and beyond  
6           over the course of the next century as required in  
7           section 302(c) of the National Aeronautics and  
8           Space Administration Authorization Act of 2010 (42  
9           U.S.C. 18322(c)); and

10          (3) in order to promote safety and reduce pro-  
11          grammatic risk, the Administrator shall budget for  
12          and undertake a robust ground test and uncrewed  
13          and crewed flight test and demonstration program  
14          for the Space Launch System and the Orion crew  
15          vehicle and shall budget for an operational flight  
16          rate sufficient to maintain safety and operational  
17          readiness.

18          (b) SENSE OF CONGRESS.—It is the sense of Con-  
19          gress that the President’s annual budget requests for the  
20          Space Launch System and Orion crew vehicle develop-  
21          ment, test, and operational phases should strive to accu-  
22          rately reflect the resource requirements of each of those  
23          phases, consistent with the policy established in section  
24          201(a) of this Act.

1       (c) IN GENERAL.—Given the critical importance of  
2 a heavy-lift launch vehicle and crewed spacecraft to enable  
3 the achievement of the goal established in section 201(a)  
4 of this Act, as well as the accomplishment of intermediate  
5 exploration milestones and the provision of a backup capa-  
6 bility to transfer crew and cargo to the International  
7 Space Station, the Administrator shall make the expedi-  
8 tious development, test, and achievement of operational  
9 readiness of the Space Launch System and the Orion crew  
10 vehicle the highest priority of the exploration program.

11       (d) GOVERNMENT ACCOUNTABILITY OFFICE RE-  
12 VIEW.—Not later than 270 days after the date of enact-  
13 ment of this Act, the Comptroller General shall transmit  
14 to the Committee on Science, Space, and Technology of  
15 the House of Representatives and the Committee on Com-  
16 merce, Science, and Transportation of the Senate a report  
17 on the Administration’s acquisition of ground systems in  
18 support of the Space Launch System. The report shall as-  
19 sess the extent to which ground systems acquired in sup-  
20 port of the Space Launch System are focused on the direct  
21 support of the Space Launch System and shall identify  
22 any ground support projects or activities that the Admin-  
23 istration is undertaking that do not solely or primarily  
24 support the Space Launch System.

1       (e) UTILIZATION REPORT.—The Administrator, in  
2 consultation with the Secretary of Defense and the Direc-  
3 tor of National Intelligence, shall prepare a report that  
4 addresses the effort and budget required to enable and  
5 utilize a cargo variant of the 130-ton Space Launch Sys-  
6 tem configuration described in section 302(c) of the Na-  
7 tional Aeronautics and Space Administration Authoriza-  
8 tion Act of 2010 (42 U.S.C. 18322(c)). This report shall  
9 also include consideration of the technical requirements of  
10 the scientific and national security communities related to  
11 such Space Launch System and shall directly assess the  
12 utility and estimated cost savings obtained by using such  
13 Space Launch System for national security and space  
14 science missions. The Administrator shall transmit such  
15 report to the Committee on Science, Space, and Tech-  
16 nology of the House of Representatives and the Committee  
17 on Commerce, Science, and Transportation of the Senate  
18 not later than 180 days after the date of enactment of  
19 this Act.

20       (f) NAMING COMPETITION.—Beginning not later  
21 than 180 days after the date of enactment of this Act and  
22 concluding not later than 1 year after such date of enact-  
23 ment, the Administrator shall conduct a well-publicized  
24 competition among students in elementary and secondary

1 schools to name the elements of the Administration’s ex-  
2 ploration program, including—

3 (1) a name for the deep space human explo-  
4 ration program as a whole, which includes the Space  
5 Launch System, the Orion crew vehicle, and future  
6 missions; and

7 (2) a name for the Space Launch System.

8 (g) ADVANCED BOOSTER COMPETITION.—

9 (1) REPORT.—Not later than 90 days after the  
10 date of enactment of this Act, the Associate Admin-  
11 istrator of the Administration shall transmit to the  
12 Committee on Science, Space, and Technology of the  
13 House of Representatives and the Committee on  
14 Commerce, Science, and Transportation of the Sen-  
15 ate a report that—

16 (A) describes the estimated total develop-  
17 ment cost of an advanced booster for the Space  
18 Launch System;

19 (B) details any reductions or increases to  
20 the development cost of the Space Launch Sys-  
21 tem which may result from conducting a com-  
22 petition for an advanced booster; and

23 (C) outlines any potential schedule delay to  
24 the Space Launch System 2018 Exploration  
25 Mission–1 launch as a result of increased costs

1 associated with conducting a competition for an  
2 advanced booster.

3 (2) COMPETITION.—If the Associate Adminis-  
4 trator reports reductions pursuant to paragraph  
5 (1)(B), and no adverse schedule impact pursuant to  
6 paragraph (1)(C), then the Administration shall con-  
7 duct a full and open competition for an advanced  
8 booster for the Space Launch System to meet the  
9 requirements described in section 302(c) of the Na-  
10 tional Aeronautics and Space Administration Au-  
11 thorization Act of 2010 (42 U.S.C. 18322(c)), to  
12 begin as soon as practicable after the development of  
13 the upper stage has been initiated.

14 **SEC. 204. ORION CREW VEHICLE.**

15 (a) IN GENERAL.—The Orion crew vehicle shall meet  
16 the needs and the minimum capability requirements de-  
17 scribed in section 303 of the National Aeronautics and  
18 Space Administration Authorization Act of 2010 (42  
19 U.S.C. 18323).

20 (b) REPORT.—Not later than 60 days after the date  
21 of enactment of this Act, the Administrator shall transmit  
22 a report to the Committee on Science, Space, and Tech-  
23 nology of the House of Representatives and the Committee  
24 on Commerce, Science, and Transportation of the Sen-  
25 ate—

1           (1) detailing those components and systems of  
2           the Orion crew vehicle that ensure it is in compli-  
3           ance with section 303(b) of such Act (42 U.S.C.  
4           18323(b));

5           (2) detailing the expected date that the Orion  
6           crew vehicle will be available to transport crew and  
7           cargo to the International Space Station; and

8           (3) certifying that the requirements of section  
9           303(b)(3) of such Act (42 U.S.C. 18323(b)(3)) will  
10          be met by the Administration.

11 **SEC. 205. SPACE RADIATION.**

12          (a) STRATEGY AND PLAN.—

13           (1) IN GENERAL.—The Administrator shall de-  
14          velop a space radiation mitigation and management  
15          strategy and implementation plan to enable the  
16          achievement of the goal established in section 201  
17          that includes key research and monitoring require-  
18          ments, milestones, a timetable, and an estimate of  
19          facility and budgetary requirements.

20           (2) COORDINATION.—The strategy shall include  
21          a mechanism for coordinating Administration re-  
22          search, technology, facilities, engineering, operations,  
23          and other functions required to support the strategy  
24          and plan.



1           (3) TRANSMITTAL.—Not later than 1 year after  
2       the date of enactment of this Act, the Administrator  
3       shall transmit the strategy and plan to the Com-  
4       mittee on Science, Space, and Technology of the  
5       House of Representatives and the Committee on  
6       Commerce, Science, and Transportation of the Sen-  
7       ate.

8       (b) SPACE RADIATION RESEARCH FACILITIES.—The  
9       Administrator, in consultation with the heads of other ap-  
10      propriate Federal agencies, shall assess the national capa-  
11      bilities for carrying out critical ground-based research on  
12      space radiation biology and shall identify any issues that  
13      could affect the ability to carry out that research.

14   **SEC. 206. PLANETARY PROTECTION FOR HUMAN EXPLO-**  
15                   **RATION MISSIONS.**

16      (a) STUDY.—The Administrator shall enter into an  
17      arrangement with the National Academies for a study to  
18      explore the planetary protection ramifications of potential  
19      future missions by astronauts such as to the lunar polar  
20      regions, near-Earth asteroids, the moons of Mars, and the  
21      surface of Mars.

22      (b) SCOPE.—The study shall—

23           (1) collate and summarize what has been done  
24      to date with respect to planetary protection meas-  
25      ures to be applied to potential human missions such

1 as to the lunar polar regions, near-Earth asteroids,  
 2 the moons of Mars, and the surface of Mars;

3 (2) identify and document planetary protection  
 4 concerns associated with potential human missions  
 5 such as to the lunar polar regions, near-Earth aster-  
 6 oids, the moons of Mars, and the surface of Mars;

7 (3) develop a methodology, if possible, for defin-  
 8 ing and classifying the degree of concern associated  
 9 with each likely destination;

10 (4) assess likely methodologies for addressing  
 11 planetary protection concerns; and

12 (5) identify areas for future research to reduce  
 13 current uncertainties.

14 (c) COMPLETION DATE.—Not later than 2 years  
 15 after the date of enactment of this Act, the Administrator  
 16 shall provide the results of the study to the Committee  
 17 on Science, Space, and Technology of the House of Rep-  
 18 resentatives and the Committee on Commerce, Science,  
 19 and Transportation of the Senate.

## 20 **Subtitle B—Space Operations**

### 21 **SEC. 211. INTERNATIONAL SPACE STATION.**

22 (a) FINDINGS.—Congress finds the following:

23 (1) The International Space Station is an ideal  
 24 testbed for future exploration systems development,  
 25 including long-duration space travel.

1           (2) The use of the private market to provide  
2           cargo and crew transportation services is currently  
3           the most expeditious process to restore domestic ac-  
4           cess to the International Space Station and low-  
5           Earth orbit.

6           (3) Government access to low-Earth orbit is  
7           paramount to the continued success of the Inter-  
8           national Space Station and National Laboratory.

9           (b) IN GENERAL.—The following is the policy of the  
10          United States:

11           (1) The United States International Space Sta-  
12           tion program shall have two primary objectives: sup-  
13           porting achievement of the goal established in sec-  
14           tion 201 of this Act and pursuing a research pro-  
15           gram that advances knowledge and provides benefits  
16           to the Nation. It shall continue to be the policy of  
17           the United States to, in consultation with its inter-  
18           national partners in the International Space Station  
19           program, support full and complete utilization of the  
20           International Space Station.

21           (2) The International Space Station shall be  
22           utilized to the maximum extent practicable for the  
23           development of capabilities and technologies needed  
24           for the future of human exploration beyond low-  
25           Earth orbit and shall be considered in the develop-

1       ment of the Human Exploration Roadmap developed  
2       under section 70504 of title 51, United States Code.

3           (3) The Administrator shall, in consultation  
4       with the International Space Station partners—

5           (A) take all necessary measures to support  
6       the operation and full utilization of the Inter-  
7       national Space Station; and

8           (B) seek to minimize, to the extent prac-  
9       ticable, the operating costs of the International  
10      Space Station.

11       (4) Reliance on foreign carriers for crew trans-  
12      fer is unacceptable, and the Nation's human space  
13      flight program must acquire the capability to launch  
14      United States astronauts on United States rockets  
15      from United States soil as soon as is safe and prac-  
16      tically possible, whether on Government-owned and  
17      operated space transportation systems or privately  
18      owned systems that have been certified for flight by  
19      the appropriate Federal agencies.

20       (c) REAFFIRMATION OF POLICY.—Congress reaf-  
21      firms—

22           (1) its commitment to the development of a  
23      commercially developed launch and delivery system  
24      to the International Space Station for crew missions  
25      as expressed in the National Aeronautics and Space

1 Administration Authorization Act of 2005 (Public  
2 Law 109–155), the National Aeronautics and Space  
3 Administration Authorization Act of 2008 (Public  
4 Law 110–422), and the National Aeronautics and  
5 Space Administration Authorization Act of 2010  
6 (Public Law 111–267);

7 (2) that the Administration shall make use of  
8 United States commercially provided International  
9 Space Station crew transfer and crew rescue services  
10 to the maximum extent practicable;

11 (3) that the Orion crew vehicle shall provide an  
12 alternative means of delivery of crew and cargo to  
13 the International Space Station, in the event other  
14 vehicles, whether commercial vehicles or partner-sup-  
15 plied vehicles, are unable to perform that function;  
16 and

17 (4) the policy stated in section 501(b) of the  
18 National Aeronautics and Space Administration Au-  
19 thorization Act of 2010 (42 U.S.C. 18351(b)) that  
20 the Administration shall pursue international, com-  
21 mercial, and intragovernmental means to maximize  
22 International Space Station logistics supply, mainte-  
23 nance, and operational capabilities, reduce risks to  
24 International Space Station systems sustainability,

1       and offset and minimize United States operations  
2       costs relating to the International Space Station.

3       (d) ASSURED ACCESS TO LOW-EARTH ORBIT.—Sec-  
4       tion 70501(a) of title 51, United States Code, is amended  
5       to read as follows:

6       “(a) POLICY STATEMENT.—It is the policy of the  
7       United States to maintain an uninterrupted capability for  
8       human space flight and operations in low-Earth orbit, and  
9       beyond, as an essential instrument of national security  
10      and the capability to ensure continued United States par-  
11      ticipation and leadership in the exploration and utilization  
12      of space.”.

13      (e) REPEALS.—

14           (1) USE OF SPACE SHUTTLE OR ALTER-  
15      NATIVES.—Chapter 701 of title 51, United States  
16      Code, and the item relating to such chapter in the  
17      table of chapters for such title, are repealed.

18           (2) SHUTTLE PRICING POLICY FOR COMMER-  
19      CIAL AND FOREIGN USERS.—Chapter 703 of title  
20      51, United States Code, and the item relating to  
21      such chapter in the table of chapters for such title,  
22      are repealed.

23           (3) SHUTTLE PRIVATIZATION.—Section 50133  
24      of title 51, United States Code, and the item relat-

1       ing to such section in the table of sections for chap-  
2       ter 501 of such title, are repealed.

3       (f) EXTENSION CRITERIA REPORT.—Not later than  
4   1 year after the date of enactment of this Act, the Admin-  
5   istrator shall submit to the Committee on Science, Space,  
6   and Technology of the House of Representatives and the  
7   Committee on Commerce, Science, and Transportation of  
8   the Senate a report on the feasibility of extending the op-  
9   eration of the International Space Station that includes—

10           (1) criteria for defining the International Space  
11       Station as a research success;

12           (2) any necessary contributions to enabling exe-  
13       cution of the Human Exploration Roadmap devel-  
14       oped under section 70504 of title 51, United States  
15       Code;

16           (3) cost estimates for operating the Inter-  
17       national Space Station to achieve the criteria re-  
18       quired under paragraph (1);

19           (4) cost estimates for extending operations to  
20       2024 and 2030;

21           (5) an assessment of how the defined criteria  
22       under paragraph (1) respond to the National Acad-  
23       emies Decadal Survey on Biological and Physical  
24       Sciences in Space; and

1           (6) an identification of the actions and cost es-  
2       timate needed to deorbit the International Space  
3       Station once a decision is made to deorbit the lab-  
4       oratory.

5       (g) STRATEGIC PLAN FOR INTERNATIONAL SPACE  
6       STATION RESEARCH.—

7           (1) IN GENERAL.—The Director of the Office of  
8       Science and Technology Policy, in consultation with  
9       the Administrator, academia, other Federal agencies,  
10      the International Space Station National Laboratory  
11      Advisory Committee, and other potential stake-  
12      holders, shall develop and transmit to the Committee  
13      on Science, Space, and Technology of the House of  
14      Representatives and the Committee on Commerce,  
15      Science, and Transportation of the Senate a stra-  
16      tegic plan for conducting competitive, peer-reviewed  
17      research in physical and life sciences and related  
18      technologies on the International Space Station  
19      through at least 2020.

20           (2) PLAN REQUIREMENTS.—The strategic plan  
21      shall—

22           (A) be consistent with the priorities and  
23           recommendations established by the National  
24           Academies in its Decadal Survey on Biological  
25           and Physical Sciences in Space;



1 (B) provide a research timeline and iden-  
2 tify resource requirements for its implementa-  
3 tion, including the facilities and instrumenta-  
4 tion necessary for the conduct of such research;  
5 and

6 (C) identify—

7 (i) criteria for the proposed research,  
8 including—

9 (I) a justification for the research  
10 to be carried out in the space micro-  
11 gravity environment;

12 (II) the use of model systems;

13 (III) the testing of flight hard-  
14 ware to understand and ensure its  
15 functioning in the microgravity envi-  
16 ronment;

17 (IV) the use of controls to help  
18 distinguish among the direct and indi-  
19 rect effects of microgravity, among  
20 other effects of the flight or space en-  
21 vironment;

22 (V) approaches for facilitating  
23 data collection, analysis, and interpre-  
24 tation;

1 (VI) procedures to ensure repeti-  
2 tion of experiments, as needed;

3 (VII) support for timely presen-  
4 tation of the peer-reviewed results of  
5 the research;

6 (VIII) defined metrics for the  
7 success of each study; and

8 (IX) how these activities enable  
9 the Human Exploration Roadmap de-  
10 scribed in section 70504 of title 51,  
11 United States Code;

12 (ii) instrumentation required to sup-  
13 port the measurements and analysis of the  
14 research to be carried out under the stra-  
15 tegic plan;

16 (iii) the capabilities needed to support  
17 direct, real-time communications between  
18 astronauts working on research experi-  
19 ments onboard the International Space  
20 Station and the principal investigator on  
21 the ground;

22 (iv) a process for involving the exter-  
23 nal user community in research planning,  
24 including planning for relevant flight hard-  
25 ware and instrumentation, and for utiliza-

tion of the International Space Station,  
free flyers, or other research platforms;

(v) the acquisition strategy the Administration plans to use to acquire any new support capabilities which are not operational on the International Space Station as of the date of enactment of this Act, and the criteria the Administration will apply if less than full and open competition is selected; and

(vi) defined metrics for success of the research plan.

**SEC. 212. BARRIERS IMPEDING ENHANCED UTILIZATION OF  
THE ISS'S NATIONAL LABORATORY BY COMMERCIAL COMPANIES.**

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) enhanced utilization of the International Space Station's National Laboratory requires a full understanding of the barriers impeding such utilization and actions needed to be taken to remove or mitigate them to the maximum extent practicable; and

(2) doing so will allow the Administration to encourage commercial companies to invest in micro-

1 gravity research using National Laboratory research  
2 facilities.

3 (b) ASSESSMENT.—The Administrator shall enter  
4 into an arrangement with the National Academies for an  
5 assessment to—

6 (1) identify barriers impeding enhanced utiliza-  
7 tion of the International Space Station’s National  
8 Laboratory;

9 (2) recommend ways to encourage commercial  
10 companies to make greater use of the International  
11 Space Station’s National Laboratory, including cor-  
12 porate investment in microgravity research; and

13 (3) identify any legislative changes that may be  
14 required.

15 (c) TRANSMITTAL.—Not later than 1 year after the  
16 date of enactment of this Act, the Administrator shall  
17 transmit to the Committee on Science, Space, and Tech-  
18 nology of the House of Representatives and the Committee  
19 on Commerce, Science, and Transportation of the Senate  
20 the results of the assessment described in subsection (b).

21 **SEC. 213. UTILIZATION OF INTERNATIONAL SPACE STA-**  
22 **TION FOR SCIENCE MISSIONS.**

23 The Administrator shall utilize the International  
24 Space Station for Science Mission Directorate missions in

1 low-Earth orbit wherever it is practical and cost effective  
2 to do so.

3 **SEC. 214. INTERNATIONAL SPACE STATION CARGO RESUP-**  
4 **PLY SERVICES LESSONS LEARNED.**

5 Not later than 120 days after the date of enactment  
6 of this Act, the Administrator shall transmit a report to  
7 the Committee on Science, Space, and Technology of the  
8 House of Representatives and the Committee on Com-  
9 merce, Science, and Transportation of the Senate that—

10 (1) identifies the lessons learned to date from  
11 the Commercial Resupply Services contract;

12 (2) indicates whether changes are needed to the  
13 manner in which the Administration procures and  
14 manages similar services upon the expiration of the  
15 existing Commercial Resupply Services contract; and

16 (3) identifies any lessons learned from the Com-  
17 mercial Resupply Services contract that should be  
18 applied to the procurement and management of com-  
19 mercially provided crew transfer services to and  
20 from the International Space Station.

21 **SEC. 215. COMMERCIAL CREW PROGRAM.**

22 (a) SENSE OF CONGRESS.—It is the sense of Con-  
23 gress that once developed and certified to meet the Admin-  
24 istration’s safety and reliability requirements, United  
25 States commercially provided crew transportation systems

1 offer the potential of serving as the primary means of  
2 transporting American astronauts and international part-  
3 ner astronauts to and from the International Space Sta-  
4 tion and serving as International Space Station emergency  
5 crew rescue vehicles. At the same time, the budgetary as-  
6 sumptions used by the Administration in its planning for  
7 the Commercial Crew Program have consistently assumed  
8 significantly higher funding levels than have been author-  
9 ized and appropriated by Congress. It is the sense of Con-  
10 gress that credibility in the Administration's budgetary es-  
11 timates for the Commercial Crew Program can be en-  
12 hanced by an independently developed cost estimate. Such  
13 credibility in budgetary estimates is an important factor  
14 in understanding program risk.

15 (b) OBJECTIVE.—The objective of the Administra-  
16 tion's Commercial Crew Program shall be to assist the de-  
17 velopment of at least one crew transportation system to  
18 carry Administration astronauts safely, reliably, and  
19 affordably to and from the International Space Station  
20 and to serve as an emergency crew rescue vehicle as soon  
21 as practicable within the funding levels authorized. The  
22 Administration shall not use any considerations beyond  
23 this objective in the overall acquisition strategy.

24 (c) SAFETY.—Consistent with the findings and rec-  
25 ommendations of the Columbia Accident Investigation

1 Board, the Administration shall ensure that safety and the  
2 minimization of the probability of loss of crew are the  
3 highest priorities of the commercial crew transportation  
4 program.

5 (d) COST MINIMIZATION.—The Administrator shall  
6 strive through the competitive selection process to mini-  
7 mize the life cycle cost to the Administration through the  
8 planned period of commercially provided crew transpor-  
9 tation services.

10 (e) TRANSPARENCY.—Transparency is the corner-  
11 stone of ensuring a safe and reliable commercial crew  
12 transportation service to the International Space Station.  
13 The Administrator shall, to the greatest extent prac-  
14 ticable, ensure that every commercial crew transportation  
15 services provider has provided evidence-based support for  
16 their costs and schedule.

17 (f) INDEPENDENT COST AND SCHEDULE ESTI-  
18 MATE.—

19 (1) REQUIREMENT.—Not later than 60 days  
20 after the date of enactment of this Act, the Adminis-  
21 trator shall arrange for the initiation of an Inde-  
22 pendent Cost and Schedule Estimate for—

23 (A) all activities associated with the devel-  
24 opment, test, demonstration, and certification  
25 of commercial crew transportation systems;

1 (B) transportation and rescue services re-  
2 quired by the Administration for International  
3 Space Station operations through calendar year  
4 2020 or later if Administration requirements so  
5 dictate; and

6 (C) the estimated date of operational read-  
7 iness for the program.

8 (2) TRANSMITTAL.—Not later than 180 days  
9 after initiation of the Independent Cost and Sched-  
10 ule Estimate under paragraph (1), the Adminis-  
11 trator shall transmit the results of the Independent  
12 Cost and Schedule Estimate to the Committee on  
13 Science, Space, and Technology of the House of  
14 Representatives and the Committee on Commerce,  
15 Science, and Transportation of the Senate.

16 **SEC. 216. SPACE COMMUNICATIONS.**

17 (a) PLAN.—The Administrator shall develop a plan,  
18 in consultation with relevant Federal agencies, for updat-  
19 ing the Administration's space communications and navi-  
20 gation architecture for low-Earth orbital and deep space  
21 operations so that it is capable of meeting the Administra-  
22 tion's communications needs over the next 20 years. The  
23 plan shall include lifecycle cost estimates, milestones, esti-  
24 mated performance capabilities, and 5-year funding pro-  
25 files. The plan shall also include an estimate of the



1 amounts of any reimbursements the Administration is  
2 likely to receive from other Federal agencies during the  
3 expected life of the upgrades described in the plan. At a  
4 minimum, the plan shall include a description of the fol-  
5 lowing:

6           (1) Steps to sustain the existing space commu-  
7           nications and navigation network and infrastructure  
8           and priorities for how resources will be applied and  
9           cost estimates for the maintenance of existing space  
10          communications network capabilities.

11          (2) Upgrades needed to support space commu-  
12          nications and navigation network and infrastructure  
13          requirements, including cost estimates and schedules  
14          and an assessment of the impact on missions if re-  
15          sources are not secured at the level needed.

16          (3) Projected space communications and navi-  
17          gation network requirements for the next 20 years,  
18          including those in support of human space explo-  
19          ration missions.

20          (4) Projected Tracking and Data Relay Sat-  
21          ellite System requirements for the next 20 years, in-  
22          cluding those in support of other relevant Federal  
23          agencies, and cost and schedule estimates to main-  
24          tain and upgrade the Tracking and Data Relay Sat-  
25          ellite System to meet projected requirements.

1           (5) Steps the Administration is taking to meet  
 2           future space communications requirements after all  
 3           Tracking and Data Relay Satellite System third-gen-  
 4           eration communications satellites are operational.

5           (6) Steps the Administration is taking to miti-  
 6           gate threats to electromagnetic spectrum use.

7           (b) SCHEDULE.—The Administrator shall transmit  
 8           the plan developed under this section to the Committee  
 9           on Science, Space, and Technology of the House of Rep-  
 10          resentatives and the Committee on Commerce, Science,  
 11          and Transportation of the Senate not later than 1 year  
 12          after the date of enactment of this Act.

## 13                           **TITLE III—SCIENCE**

### 14                           **Subtitle A—General**

#### 15   **SEC. 301. SCIENCE PORTFOLIO.**

16          (a) BALANCED AND ADEQUATELY FUNDED ACTIVI-  
 17          TIES.—Section 803 of the National Aeronautics and Space  
 18          Administration Authorization Act of 2010 (124 Stat.  
 19          2832) is amended to read as follows:

#### 20   **“SEC. 803. OVERALL SCIENCE PORTFOLIO—SENSE OF THE** 21                           **CONGRESS.**

22          “Congress reaffirms its sense, expressed in the Na-  
 23          tional Aeronautics and Space Administration Authoriza-  
 24          tion Act of 2010, that a balanced and adequately funded  
 25          set of activities, consisting of research and analysis grants

1 programs, technology development, small, medium, and  
2 large space missions, and suborbital research activities,  
3 contributes to a robust and productive science program  
4 and serves as a catalyst for innovation and discovery.”.

5 (b) DECADAL SURVEYS.—In proposing the funding  
6 of programs and activities for the Administration for each  
7 fiscal year, the Administrator shall, to the greatest extent  
8 practicable, follow guidance provided in the current  
9 decadal surveys from the National Academies’ Space  
10 Studies Board.

11 **SEC. 302. RADIOISOTOPE POWER SYSTEMS.**

12 (a) SENSE OF CONGRESS.—It is the sense of Con-  
13 gress that conducting deep space exploration requires ra-  
14 dioisotope power systems, and establishing continuity in  
15 the production of the material needed to power these sys-  
16 tems is paramount to the success of these future deep  
17 space missions. It is further the sense of Congress that  
18 Federal agencies supporting the Administration through  
19 the production of such material should do so in a cost ef-  
20 fective manner so as not to impose excessive reimburse-  
21 ment requirements on the Administration.

22 (b) ANALYSIS OF REQUIREMENTS AND RISKS.—The  
23 Director of the Office of Science and Technology Policy  
24 and the Administrator, in consultation with other Federal  
25 agencies, shall conduct an analysis of—

1           (1) the requirements of the Administration for  
2       radioisotope power system material that is needed to  
3       carry out planned, high priority robotic missions in  
4       the solar system and other surface exploration activi-  
5       ties beyond low-Earth orbit; and

6           (2) the risks to missions of the Administration  
7       in meeting those requirements, or any additional re-  
8       quirements, due to a lack of adequate radioisotope  
9       power system material.

10       (c) CONTENTS OF ANALYSIS.—The analysis con-  
11       ducted under subsection (b) shall—

12           (1) detail the Administration’s current pro-  
13       jected mission requirements and associated time-  
14       frames for radioisotope power system material;

15           (2) explain the assumptions used to determine  
16       the Administration’s requirements for the material,  
17       including—

18                (A) the planned use of advanced thermal  
19       conversion technology such as advanced  
20       thermocouples and Stirling generators and con-  
21       verters; and

22                (B) the risks and implications of, and con-  
23       tingencies for, any delays or unanticipated tech-  
24       nical challenges affecting or related to the Ad-

1           ministration’s mission plans for the anticipated  
2           use of advanced thermal conversion technology;  
3           (3) assess the risk to the Administration’s pro-  
4           grams of any potential delays in achieving the sched-  
5           ule and milestones for planned domestic production  
6           of radioisotope power system material;  
7           (4) outline a process for meeting any additional  
8           Administration requirements for the material;  
9           (5) estimate the incremental costs required to  
10          increase the amount of material produced each year,  
11          if such an increase is needed to support additional  
12          Administration requirements for the material;  
13          (6) detail how the Administration and other  
14          Federal agencies will manage, operate, and fund  
15          production facilities and the design and development  
16          of all radioisotope power systems used by the Ad-  
17          ministration and other Federal agencies as nec-  
18          essary;  
19          (7) specify the steps the Administration will  
20          take, in consultation with the Department of En-  
21          ergy, to preserve the infrastructure and workforce  
22          necessary for production of radioisotope power sys-  
23          tems and ensure that its reimbursements to the De-  
24          partment of Energy associated with such preserva-  
25          tion are equitable and justified; and

1           (8) detail how the Administration has imple-  
2           mented or rejected the recommendations from the  
3           National Research Council’s 2009 report titled “Ra-  
4           dioisotope Power Systems: An Imperative for Main-  
5           taining U.S. Leadership in Space Exploration”.

6           (d) TRANSMITTAL.—Not later than 180 days after  
7           the date of enactment of this Act, the Administrator shall  
8           transmit the results of the analysis to the Committee on  
9           Science, Space, and Technology of the House of Rep-  
10          resentatives and the Committee on Commerce, Science,  
11          and Transportation of the Senate.

12   **SEC. 303. CONGRESSIONAL DECLARATION OF POLICY AND**  
13                           **PURPOSE.**

14          Section 20102(d) of title 51, United States Code, is  
15          amended by adding at the end the following new para-  
16          graph:

17               “(10) The direction of the unique competence  
18               of the Administration to the search for life’s origin,  
19               evolution, distribution, and future in the Universe.  
20               In carrying out this objective, the Administration  
21               may use any practicable ground-based, airborne, or  
22               space-based technical means and spectra of electro-  
23               magnetic radiation.”.

1 **SEC. 304. UNIVERSITY CLASS SCIENCE MISSIONS.**

2 (a) SENSE OF CONGRESS.—It is the sense of Con-  
3 gress that principal investigator-led small orbital science  
4 missions, including CubeSat class, University Explorer  
5 (UNEX) class, Small Explorer (SMEX) class, and Ven-  
6 ture class, offer valuable opportunities to advance science  
7 at low cost, train the next generation of scientists and en-  
8 gineers, and enable participants in the program to acquire  
9 skills in systems engineering and systems integration that  
10 are critical to maintaining the Nation’s leadership in space  
11 and to enhancing the United States innovation and com-  
12 petitiveness abroad.

13 (b) REVIEW OF PRINCIPAL INVESTIGATOR-LED  
14 SMALL ORBITAL SCIENCE MISSIONS.—The Administrator  
15 shall conduct a review of the science missions described  
16 in subsection (a). The review shall include—

17 (1) the status, capability, and availability of ex-  
18 isting small orbital science mission programs and  
19 the extent to which each program enables the par-  
20 ticipation of university scientists and students;

21 (2) the opportunities such mission programs  
22 provide for scientific research;

23 (3) the opportunities such mission programs  
24 provide for training and education, including sci-  
25 entific and engineering workforce development, in-

1 including for the Administration’s scientific and engi-  
2 neering workforce; and

3 (4) the extent to which commercial applications  
4 such as hosted payloads, free flyers, and data buys  
5 could provide measurable benefits for such mission  
6 programs, while preserving the principle of inde-  
7 pendent peer review as the basis for mission selec-  
8 tion.

9 (c) REPORT.—Not later than 270 days after the date  
10 of enactment of this Act, the Administrator shall transmit  
11 to the Committee on Science, Space, and Technology of  
12 the House of Representatives and the Committee on Com-  
13 merce, Science, and Transportation of the Senate a report  
14 on the review required under subsection (b) and on rec-  
15 ommendations to enhance principal investigator-led small  
16 orbital science missions conducted by the Administration  
17 in accordance with the results of the review required by  
18 subsection (b).

19 **SEC. 305. ASSESSMENT OF SCIENCE MISSION EXTENSIONS.**

20 Section 30504 of title 51, United States Code, is  
21 amended to read as follows:

22 **“§ 30504. Assessment of science mission extensions**

23 “(a) ASSESSMENT.—The Administrator shall carry  
24 out biennial reviews within each of the Science divisions  
25 to assess the cost and benefits of extending the date of



1 the termination of data collection for those missions that  
 2 exceed their planned missions' lifetime. The assessment  
 3 shall take into consideration how extending missions im-  
 4 pacts the start of future missions.

5 “(b) CONSULTATION AND CONSIDERATION OF PO-  
 6 TENTIAL BENEFITS OF INSTRUMENTS ON MISSIONS.—  
 7 When deciding whether to extend a mission that has an  
 8 operational component, the Administrator shall consult  
 9 with any affected Federal agency and shall take into ac-  
 10 count the potential benefits of instruments on missions  
 11 that are beyond their planned mission lifetime.

12 “(c) REPORT.—The Administrator shall transmit to  
 13 the Committee on Science, Space, and Technology of the  
 14 House of Representatives and the Committee on Com-  
 15 merce, Science, and Transportation of the Senate, at the  
 16 same time as the submission to Congress of the Adminis-  
 17 tration's annual budget request for each fiscal year, a re-  
 18 port detailing any assessment required by subsection (a)  
 19 that was carried out during the previous year.”.

## 20 **Subtitle B—Astrophysics**

### 21 **SEC. 311. DECADEAL CADENCE.**

22 In carrying out section 301(b), the Administrator  
 23 shall seek to ensure to the extent practicable a steady ca-  
 24 dence of large, medium, and small astrophysics missions.

1 **SEC. 312. EXTRASOLAR PLANET EXPLORATION STRATEGY.**

2 (a) STRATEGY.—The Administrator shall enter into  
3 an arrangement with the National Academies to develop  
4 a science strategy for the study and exploration of  
5 extrasolar planets, including the use of the Transiting  
6 Exoplanet Survey Satellite, the James Webb Space Tele-  
7 scope, a potential Wide-Field Infrared Survey Telescope  
8 mission, or any other telescope, spacecraft, or instrument  
9 as appropriate. Such strategy shall—

10 (1) outline key scientific questions;

11 (2) identify the most promising research in the  
12 field;

13 (3) indicate the extent to which the mission pri-  
14 orities in existing decadal surveys address the key  
15 extrasolar planet research goals;

16 (4) identify opportunities for coordination with  
17 international partners, commercial partners, and  
18 other not-for-profit partners; and

19 (5) make recommendations on the above as ap-  
20 propriate.

21 (b) USE OF STRATEGY.—The Administrator shall use  
22 the strategy to—

23 (1) inform roadmaps, strategic plans, and other  
24 activities of the Administration as they relate to  
25 extrasolar planet research and exploration; and

1           (2) provide a foundation for future activities  
2           and initiatives.

3           (c) REPORT TO CONGRESS.—Not later than 18  
4 months after the date of enactment of this Act, the Na-  
5 tional Academies shall transmit a report to the Adminis-  
6 trator, and to the Committee on Science, Space, and Tech-  
7 nology of the House of Representatives and the Committee  
8 on Commerce, Science, and Transportation of the Senate,  
9 containing the strategy developed under subsection (a).

10 **SEC. 313. JAMES WEBB SPACE TELESCOPE.**

11           It is the sense of Congress that—

12           (1) the James Webb Space Telescope will revo-  
13 lutionize our understanding of star and planet for-  
14 mation and how galaxies evolved, and advance the  
15 search for the origins of the universe;

16           (2) the James Webb Space Telescope will en-  
17 able American scientists to maintain their leadership  
18 in astrophysics and other disciplines;

19           (3) the James Webb Space Telescope program  
20 is making steady progress towards a launch in 2018;

21           (4) the on-time and on-budget delivery of the  
22 James Webb Space Telescope is a high congressional  
23 priority; and

24           (5) maintaining this progress will require the  
25 Administrator to ensure that integrated testing is

1 appropriately timed and sufficiently comprehensive  
2 to enable potential issues to be identified and ad-  
3 dressed early enough to be handled within the James  
4 Webb Space Telescope’s development schedule prior  
5 to launch.

6 **SEC. 314. NATIONAL RECONNAISSANCE OFFICE TELESCOPE**  
7 **DONATION.**

8 Not later than 90 days after the date of enactment  
9 of this Act, the Administrator shall transmit a report to  
10 the Committee on Science, Space, and Technology of the  
11 House of Representatives and the Committee on Com-  
12 merce, Science, and Transportation of the Senate out-  
13 lining the cost of the Administration’s potential plan for  
14 developing the Wide-Field Infrared Survey Telescope as  
15 described in the 2010 National Academies’ astronomy and  
16 astrophysics decadal survey, including an alternative plan  
17 for the Wide-Field Infrared Survey Telescope 2.4, which  
18 includes the donated 2.4-meter aperture National Recon-  
19 naissance Office telescope. Due to the budget constraints  
20 on the Administration’s science programs, this report shall  
21 include—

22 (1) an assessment of cost efficient approaches  
23 to develop the Wide-Field Infrared Survey Telescope;

1           (2) a comparison to the development of mission  
2       concepts that exclude the utilization of the donated  
3       asset;

4           (3) an assessment of how the Administration's  
5       existing science missions will be affected by the utili-  
6       zation of the donated asset described in this section;  
7       and

8           (4) a description of the cost associated with  
9       storing and maintaining the donated asset.

10 **SEC. 315. WIDE-FIELD INFRARED SURVEY TELESCOPE.**

11       (a) SENSE OF CONGRESS.—It is the sense of Con-  
12       gress that the Administrator, to the extent practicable,  
13       should make progress on the technologies and capabilities  
14       needed to position the Administration to meet the objec-  
15       tives of the Wide-Field Infrared Survey Telescope mission,  
16       as outlined in the 2010 National Academies' astronomy  
17       and astrophysics decadal survey, in a way that maximizes  
18       the scientific productivity of meeting those objectives for  
19       the resources invested. It is further the sense of Congress  
20       that the Wide-Field Infrared Survey Telescope mission  
21       has the potential to enable scientific discoveries that will  
22       transform our understanding of the universe.

23       (b) CONTINUITY OF DEVELOPMENT.—The Adminis-  
24       trator shall ensure that the concept definition and pre-  
25       formulation activities of a Wide-Field Infrared Survey Tel-

1 escope mission continue while the James Webb Space Tel-  
2 escope is being completed.

3 **SEC. 316. STRATOSPHERIC OBSERVATORY FOR INFRARED**  
4 **ASTRONOMY.**

5 The Administrator shall not use any funding appro-  
6 priated to the Administration for fiscal year 2016 for the  
7 shutdown of the Stratospheric Observatory for Infrared  
8 Astronomy or for the preparation therefor.

9 **Subtitle C—Planetary Science**

10 **SEC. 321. DECADAL CADENCE.**

11 In carrying out section 301(b), the Administrator  
12 shall seek to ensure, to the greatest extent practicable,  
13 that the Administration carries out a balanced set of plan-  
14 etary science programs in accordance with the priorities  
15 established in the most recent decadal survey for planetary  
16 science. Such programs shall include, at a minimum—

17 (1) a Discovery-class mission at least once every  
18 24 months;

19 (2) a New Frontiers-class mission at least once  
20 every 60 months; and

21 (3) at least one Flagship-class mission per  
22 decadal survey period, including a Europa mission  
23 with a goal of launching by 2021.

1 **SEC. 322. NEAR-EARTH OBJECTS.**

2 (a) FINDINGS.—Congress makes the following find-  
3 ings:

4 (1) Near-Earth objects pose a serious and cred-  
5 ible threat to humankind, as many scientists believe  
6 that a major asteroid or comet was responsible for  
7 the mass extinction of the majority of the Earth’s  
8 species, including the dinosaurs, approximately 65  
9 million years ago.

10 (2) Similar objects have struck the Earth or  
11 passed through the Earth’s atmosphere several times  
12 in the Earth’s history and pose a similar threat in  
13 the future.

14 (3) Several such near-Earth objects have only  
15 been discovered within days of the objects’ closest  
16 approach to Earth, and recent discoveries of such  
17 large objects indicate that many large near-Earth  
18 objects remain to be discovered.

19 (4) The efforts undertaken by the Administra-  
20 tion for detecting and characterizing the hazards of  
21 near-Earth objects should continue to seek to fully  
22 determine the threat posed by such objects to cause  
23 widespread destruction and loss of life.

24 (b) DEFINITION.—For purposes of this section, the  
25 term “near-Earth object” means an asteroid or comet with

1 a perihelion distance of less than 1.3 Astronomical Units  
2 from the Sun.

3 (c) NEAR-EARTH OBJECT SURVEY.—The Adminis-  
4 trator shall continue to detect, track, catalogue, and char-  
5 acterize the physical characteristics of near-Earth objects  
6 equal to or greater than 140 meters in diameter in order  
7 to assess the threat of such near-Earth objects to the  
8 Earth, pursuant to the George E. Brown, Jr. Near-Earth  
9 Object Survey Act (42 U.S.C. 16691). It shall be the goal  
10 of the Survey program to achieve 90 percent completion  
11 of its near-Earth object catalogue (based on statistically  
12 predicted populations of near-Earth objects) by 2020.

13 (d) WARNING AND MITIGATION OF POTENTIAL HAZ-  
14 ARDS OF NEAR-EARTH OBJECTS.—Congress reaffirms  
15 the policy set forth in section 20102(g) of title 51, United  
16 States Code (relating to detecting, tracking, cataloguing,  
17 and characterizing asteroids and comets).

18 (e) PROGRAM REPORT.—The Director of the Office  
19 of Science and Technology Policy and the Administrator  
20 shall transmit to the Committee on Science, Space, and  
21 Technology of the House of Representatives and the Com-  
22 mittee on Commerce, Science, and Transportation of the  
23 Senate, not later than 1 year after the date of enactment  
24 of this Act, an initial report that provides—



1           (1) recommendations for carrying out the Sur-  
2       vey program and an associated proposed budget;

3           (2) analysis of possible options that the Admin-  
4       istration could employ to divert an object on a likely  
5       collision course with Earth; and

6           (3) a description of the status of efforts to co-  
7       ordinate and cooperate with other countries to dis-  
8       cover hazardous asteroids and comets, plan a mitiga-  
9       tion strategy, and implement that strategy in the  
10      event of the discovery of an object on a likely colli-  
11      sion course with Earth.

12      (f) ANNUAL REPORTS.—Subsequent to the initial re-  
13      port the Administrator shall annually transmit to the  
14      Committee on Science, Space, and Technology of the  
15      House of Representatives and the Committee on Com-  
16      merce, Science, and Transportation of the Senate a report  
17      that provides—

18           (1) a summary of all activities carried out pur-  
19       suant to subsection (c) since the date of enactment  
20       of this Act, including the progress toward achieving  
21       90 percent completion of the survey described in  
22       subsection (c); and

23           (2) a summary of expenditures for all activities  
24       carried out pursuant to subsection (c) since the date  
25       of enactment of this Act.

1 (g) STUDY.—The Administrator, in collaboration  
2 with other relevant Federal agencies, shall carry out a  
3 technical and scientific assessment of the capabilities and  
4 resources to—

5 (1) accelerate the survey described in subsection  
6 (c); and

7 (2) expand the Administration’s Near-Earth  
8 Object Program to include the detection, tracking,  
9 cataloguing, and characterization of potentially haz-  
10 ardous near-Earth objects less than 140 meters in  
11 diameter.

12 (h) TRANSMITTAL.—Not later than 270 days after  
13 the date of enactment of this Act, the Administrator shall  
14 transmit the results of the assessment carried out under  
15 subsection (g) to the Committee on Science, Space, and  
16 Technology of the House of Representatives and the Com-  
17 mittee on Commerce, Science, and Transportation of the  
18 Senate.

19 **SEC. 323. NEAR-EARTH OBJECTS PUBLIC-PRIVATE PART-**  
20 **NERSHIPS.**

21 (a) SENSE OF CONGRESS.—It is the sense of Con-  
22 gress that the Administration should seek to leverage the  
23 capabilities of the private sector and philanthropic organi-  
24 zations to the maximum extent practicable in carrying out

1 the Near-Earth Object Survey program in order to meet  
2 the goal of the Survey program.

3 (b) REPORT.—Not later than 180 days after the date  
4 of enactment of this Act, the Administrator shall transmit  
5 to the Committee on Science, Space, and Technology of  
6 the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report  
7 describing how the Administration can expand collaborative  
8 partnerships to detect, track, catalogue, and categorize  
9 near-Earth objects.  
10

11 **SEC. 324. RESEARCH ON NEAR-EARTH OBJECT TSUNAMI**  
12 **EFFECTS.**

13 (a) REPORT ON POTENTIAL TSUNAMI EFFECTS  
14 FROM NEAR-EARTH OBJECT IMPACT.—The Administrator, in collaboration with the Administrator of the National Oceanic and Atmospheric Administration and other  
15 relevant agencies, shall prepare a report identifying and  
16 describing existing research activities and further research  
17 objectives that would increase our understanding of the  
18 nature of the effects of potential tsunamis that could occur  
19 if a near-Earth object were to impact an ocean of Earth.  
20

22 (b) TRANSMITTAL.—Not later than 180 days after  
23 the date of enactment of this Act, the Administrator shall  
24 transmit the report required and prepared under subsection (a) to the Committee on Science, Space, and Technology  
25

1 nology of the House of Representatives and the Committee  
2 on Commerce, Science, and Transportation of the Senate.

3 **SEC. 325. ASTROBIOLOGY STRATEGY.**

4 (a) STRATEGY.—The Administrator shall enter into  
5 an arrangement with the National Academies to develop  
6 a science strategy for astrobiology that would outline key  
7 scientific questions, identify the most promising research  
8 in the field, and indicate the extent to which the mission  
9 priorities in existing decadal surveys address the search  
10 for life’s origin, evolution, distribution, and future in the  
11 Universe. The strategy shall include recommendations for  
12 coordination with international partners.

13 (b) USE OF STRATEGY.—The Administrator shall use  
14 the strategy developed under subsection (a) in planning  
15 and funding research and other activities and initiatives  
16 in the field of astrobiology.

17 (c) REPORT TO CONGRESS.—Not later than 18  
18 months after the date of enactment of this Act, the Na-  
19 tional Academies shall transmit a report to the Adminis-  
20 trator, and to the Committee on Science, Space, and Tech-  
21 nology of the House of Representatives and the Committee  
22 on Commerce, Science, and Transportation of the Senate,  
23 containing the strategy developed under subsection (a).

1 **SEC. 326. ASTROBIOLOGY PUBLIC-PRIVATE PARTNERSHIPS.**

2 Not later than 180 days after the date of enactment  
3 of this Act, the Administrator shall transmit to the Com-  
4 mittee on Science, Space, and Technology of the House  
5 of Representatives and the Committee on Commerce,  
6 Science, and Transportation of the Senate a report de-  
7 scribing how the Administration can expand collaborative  
8 partnerships to study life's origin, evolution, distribution,  
9 and future in the Universe.

10 **SEC. 327. ASSESSMENT OF MARS ARCHITECTURE.**

11 (a) ASSESSMENT.—The Administrator shall enter  
12 into an arrangement with the National Academies to as-  
13 sess—

14 (1) the Administration's revised post-2016  
15 Mars exploration architecture and its responsiveness  
16 to the strategies, priorities, and guidelines put for-  
17 ward by the National Academies' planetary science  
18 decadal surveys and other relevant National Acad-  
19 emies Mars-related reports;

20 (2) the long-term goals of the Administration's  
21 Mars Exploration Program and such program's abil-  
22 ity to optimize the science return, given the current  
23 fiscal posture of the program;

24 (3) the Mars architecture's relationship to  
25 Mars-related activities to be undertaken by agencies  
26 and organizations outside of the United States; and

1           (4) the extent to which the Mars architecture  
2       represents a reasonably balanced mission portfolio.

3       (b) TRANSMITTAL.—Not later than 18 months after  
4 the date of enactment of this Act, the Administrator shall  
5 transmit the results of the assessment to the Committee  
6 on Science, Space, and Technology of the House of Rep-  
7 resentatives and the Committee on Commerce, Science,  
8 and Transportation of the Senate.

## 9           **Subtitle D—Heliophysics**

### 10   **SEC. 331. DECADAL CADENCE.**

11       In carrying out section 301(b), the Administrator  
12 shall seek to ensure to the extent practicable a steady ca-  
13 dence of large, medium, and small heliophysics missions.

### 14   **SEC. 332. REVIEW OF SPACE WEATHER.**

15       (a) REVIEW.—The Director of the Office of Science  
16 and Technology Policy, in consultation with the Adminis-  
17 trator, the Administrator of the National Oceanic and At-  
18 mospheric Administration, the Director of the National  
19 Science Foundation, and heads of other relevant Federal  
20 agencies, shall enter into an arrangement with the Na-  
21 tional Academies to provide a comprehensive study that  
22 reviews current and planned ground-based and space-  
23 based space weather monitoring requirements and capa-  
24 bilities, identifies gaps, and identifies options for a robust  
25 and resilient capability. The study shall inform the process

1 of identifying national needs for future space weather  
2 monitoring, forecasts, and mitigation. The National Acad-  
3 emies shall give consideration to international and private  
4 sector efforts and collaboration that could potentially con-  
5 tribute to national space weather needs. The study shall  
6 also review the current state of research capabilities in ob-  
7 serving, modeling, and prediction and provide rec-  
8 ommendations to ensure future advancement of predictive  
9 capability.

10 (b) REPORT TO CONGRESS.—Not later than 14  
11 months after the date of enactment of this Act, the Na-  
12 tional Academies shall transmit a report containing the  
13 results of the study provided under subsection (a) to the  
14 Director of the Office of Science and Technology Policy,  
15 and to the Committee on Science, Space, and Technology  
16 of the House of Representatives and the Committee on  
17 Commerce, Science, and Transportation of the Senate.

## 18 **Subtitle E—Earth Science**

### 19 **SEC. 341. GOAL.**

20 (a) SENSE OF CONGRESS.—It is the sense of Con-  
21 gress that the Administration is being asked to undertake  
22 important Earth science activities in an environment of  
23 increasingly constrained fiscal resources, and that any  
24 transfer of additional responsibilities to the Administra-  
25 tion, such as climate instrument development and meas-

1 urements that are currently part of the portfolio of the  
2 National Oceanic and Atmospheric Administration, should  
3 be accompanied by the provision of additional resources  
4 to allow the Administration to carry out the increased re-  
5 sponsibilities without adversely impacting its implementa-  
6 tion of its existing Earth science programs and priorities.

7 (b) GENERAL.—The Administrator shall continue to  
8 carry out a balanced Earth science program that includes  
9 Earth science research, Earth systematic missions, com-  
10 petitive Venture class missions, other missions and data  
11 analysis, mission operations, technology development, and  
12 applied sciences, consistent with the recommendations and  
13 priorities established in the National Academies’ Earth  
14 Science Decadal Survey.

15 (c) COLLABORATION.—The Administrator shall col-  
16 laborate with other Federal agencies, including the Na-  
17 tional Oceanic and Atmospheric Administration, non-gov-  
18 ernment entities, and international partners, as appro-  
19 priate, in carrying out the Administration’s Earth science  
20 program. The Administration shall continue to develop  
21 first-of-a-kind instruments that, once proved, can be  
22 transitioned to other agencies for operations.

23 (d) REIMBURSEMENT.—Whenever responsibilities for  
24 the development of sensors or for measurements are trans-  
25 ferred to the Administration from another agency, the Ad-



1   ministration shall seek, to the extent possible, to be reim-  
2   bursed for the assumption of such responsibilities.

3   **SEC. 342. DECADAL CADENCE.**

4       In carrying out section 341(b), the Administrator  
5   shall seek to ensure to the extent practicable a steady ca-  
6   dence of large, medium, and small Earth science missions.

7   **SEC. 343. VENTURE CLASS MISSIONS.**

8       It is the sense of Congress that the Administration's  
9   Venture class missions provide opportunities for innova-  
10   tion in the Earth science program, offer low-cost ap-  
11   proaches for high-quality competitive science investiga-  
12   tions, enable frequent flight opportunities to engage the  
13   Earth science and applications community, and serve as  
14   a training ground for students and young scientists. It is  
15   further the sense of Congress that the Administration  
16   should seek to increase the number of Venture class  
17   projects to the extent practicable as part of a balanced  
18   Earth science program.

19   **SEC. 344. ASSESSMENT.**

20       The Administrator shall carry out a scientific assess-  
21   ment of the Administration's Earth science global datasets  
22   for the purpose of identifying those datasets that are use-  
23   ful for understanding regional changes and variability, and  
24   for informing applied science research. The Administrator  
25   shall complete and transmit the assessment to the Com-

1 mittee on Science, Space, and Technology of the House  
2 of Representatives and the Committee on Commerce,  
3 Science, and Transportation of the Senate not later than  
4 180 days after the date of enactment of this Act.

## 5 **TITLE IV—AERONAUTICS**

### 6 **SEC. 401. SENSE OF CONGRESS.**

7 It is the sense of Congress that—

8 (1) a robust aeronautics research portfolio will  
9 help maintain the United States status as a leader  
10 in aviation, enhance the competitiveness of the  
11 United States in the world economy and improve the  
12 quality of life of all citizens;

13 (2) aeronautics research is essential to the Ad-  
14 ministration’s mission, continues to be an important  
15 core element of the Administration’s mission and  
16 should be supported;

17 (3) the Administrator should coordinate and  
18 consult with relevant Federal agencies and the pri-  
19 vate sector to minimize duplication and leverage re-  
20 sources; and

21 (4) carrying aeronautics research to a level of  
22 maturity that allows the Administration’s research  
23 results to be transitioned to the users, whether pri-  
24 vate or public sector, is critical to their eventual  
25 adoption.

1 **SEC. 402. AERONAUTICS RESEARCH GOALS.**

2       The Administrator shall ensure that the Administra-  
3 tion maintains a strong aeronautics research portfolio  
4 ranging from fundamental research through integrated  
5 systems research with specific research goals, including  
6 the following:

7           (1) ENHANCE AIRSPACE OPERATIONS AND  
8 SAFETY.—The Administration’s Aeronautics Re-  
9 search Mission Directorate shall address research  
10 needs of the Next Generation Air Transportation  
11 System and identify critical gaps in technology  
12 which must be bridged to enable the implementation  
13 of the Next Generation Air Transportation System  
14 so that safety and productivity improvements can be  
15 achieved as soon as possible.

16           (2) IMPROVE AIR VEHICLE PERFORMANCE.—  
17 The Administration’s Aeronautics Research Mission  
18 Directorate shall conduct research to improve air-  
19 craft performance and minimize environmental im-  
20 pacts. The Associate Administrator for the Aero-  
21 nautics Research Mission Directorate shall consider  
22 and pursue concepts to reduce noise, emissions, and  
23 fuel consumption while maintaining high safety  
24 standards, and shall conduct research related to the  
25 impact of alternative fuels on the safety, reliability  
26 and maintainability of current and new air vehicles.

1           (3) STRENGTHEN AVIATION SAFETY.—The Ad-  
2           ministration’s Aeronautics Research Mission Direc-  
3           torate shall proactively address safety challenges as-  
4           sociated with current and new air vehicles and with  
5           operations in the Nation’s current and future air  
6           transportation system.

7           (4) DEMONSTRATE CONCEPTS AT THE SYSTEM  
8           LEVEL.—The Administration’s Aeronautics Research  
9           Mission Directorate shall mature the most promising  
10          technologies to the point at which they can be dem-  
11          onstrated in a relevant environment and shall inte-  
12          grate individual components and technologies as ap-  
13          propriate to ensure that they perform in an inte-  
14          grated manner as well as they do when operated in-  
15          dividually.

16 **SEC. 403. UNMANNED AERIAL SYSTEMS RESEARCH AND DE-**  
17 **VELOPMENT.**

18          (a) IN GENERAL.—The Administrator, in consulta-  
19          tion with the Administrator of the Federal Aviation Ad-  
20          ministration and other Federal agencies, shall carry out  
21          research and technological development to facilitate the  
22          safe integration of unmanned aerial systems into the Na-  
23          tional Airspace System, including—

24                (1) positioning and navigation systems;

25                (2) sense and avoid capabilities;

1 (3) secure data and communication links;

2 (4) flight recovery systems; and

3 (5) human systems integration.

4 (b) ROADMAP.—The Administrator shall update a  
5 roadmap for unmanned aerial systems research and devel-  
6 opment and transmit this roadmap to the Committee on  
7 Science, Space, and Technology of the House of Rep-  
8 resentatives and the Committee on Commerce, Science,  
9 and Transportation of the Senate not later than 180 days  
10 after the date of enactment of this Act.

11 (c) COOPERATIVE UNMANNED AERIAL VEHICLE AC-  
12 TIVITIES.—Section 31504 of title 51, United States Code,  
13 is amended by inserting “Operational flight data derived  
14 from these cooperative agreements shall be made available,  
15 in appropriate and usable formats, to the Administration  
16 and the Federal Aviation Administration for the develop-  
17 ment of regulatory standards.” after “in remote areas.”.

18 **SEC. 404. RESEARCH PROGRAM ON COMPOSITE MATERIALS**

19 **USED IN AERONAUTICS.**

20 (a) PURPOSE OF RESEARCH.—The Administrator  
21 shall continue the Administration’s cooperative research  
22 program with industry to identify and demonstrate more  
23 effective and safe ways of developing, manufacturing, and  
24 maintaining composite materials for use in airframes, sub-  
25 systems, and propulsion components.

1       (b) EXPOSURE OF RESEARCH TO NEXT GENERATION  
2 OF ENGINEERS AND TECHNICIANS.—To the extent prac-  
3 ticable, the Administration’s cooperative research program  
4 with industry on composite materials shall provide timely  
5 access to that research to the next generation of engineers  
6 and technicians at universities, community colleges, and  
7 vocational schools, thereby helping to develop a workforce  
8 ready to take on the development, manufacture, and main-  
9 tenance of components reliant on advanced composite ma-  
10 terials.

11       (c) CONSULTATION.—The Administrator, in over-  
12 seeing the Administration’s work on composite materials,  
13 shall consult with relevant Federal agencies and partners  
14 in industry to accelerate safe development and certifi-  
15 cation processes for new composite materials and design  
16 methods while maintaining rigorous inspection of new  
17 composite materials.

18       (d) REPORT.—Not later than 1 year after the date  
19 of enactment of this Act, the Administrator shall transmit  
20 a report to the Committee on Science, Space, and Tech-  
21 nology of the House of Representatives and the Committee  
22 on Commerce, Science, and Transportation of the Senate  
23 detailing the Administration’s work on new composite ma-  
24 terials and the coordination efforts among Federal agen-  
25 cies and industry partners.

1 **SEC. 405. HYPERSONIC RESEARCH.**

2 Not later than 1 year after the date of enactment  
3 of this Act, the Administrator, in consultation with other  
4 Federal agencies, shall develop and transmit to the Com-  
5 mittee on Science, Space, and Technology of the House  
6 of Representatives and the Committee on Commerce,  
7 Science, and Transportation of the Senate a research and  
8 development roadmap for hypersonic aircraft research  
9 with the objective of exploring hypersonic science and  
10 technology using air-breathing propulsion concepts,  
11 through a mix of theoretical work, basic and applied re-  
12 search, and development of flight research demonstration  
13 vehicles. The roadmap shall prescribe appropriate agency  
14 contributions, coordination efforts, and technology mile-  
15 stones.

16 **SEC. 406. SUPERSONIC RESEARCH.**

17 (a) FINDINGS.—Congress finds that—

18 (1) the ability to fly commercial aircraft over  
19 land at supersonic speeds without adverse impacts  
20 on the environment or on local communities could  
21 open new global markets and enable new transpor-  
22 tation capabilities; and

23 (2) continuing the Administration’s research  
24 program is necessary to assess the impact in a rel-  
25 evant environment of commercial supersonic flight  
26 operations and provide the basis for establishing ap-

1       appropriate sonic boom standards for such flight oper-  
2       ations.

3       (b) ROADMAP FOR SUPERSONIC RESEARCH.—Not  
4 later than 1 year after the date of enactment of this Act,  
5 the Administrator shall develop and transmit to the Com-  
6 mittee on Science, Space, and Technology of the House  
7 of Representatives and the Committee on Commerce,  
8 Science, and Transportation of the Senate a roadmap that  
9 allows for flexible funding profiles for supersonic aero-  
10 nautics research and development with the objective of de-  
11 veloping and demonstrating, in a relevant environment,  
12 airframe and propulsion technologies to minimize the envi-  
13 ronmental impact, including noise, of supersonic overland  
14 flight in an efficient and economical manner. The roadmap  
15 shall include—

16           (1) the baseline research as embodied by the  
17 Administration’s existing research on supersonic  
18 flight;

19           (2) a list of specific technological, environ-  
20 mental, and other challenges that must be overcome  
21 to minimize the environmental impact, including  
22 noise, of supersonic overland flight;

23           (3) a research plan to address such challenges,  
24 as well as a project timeline for accomplishing rel-  
25 evant research goals;



1           (4) a plan for coordination with stakeholders,  
2           including relevant government agencies and indus-  
3           try; and

4           (5) a plan for how the Administration will en-  
5           sure that sonic boom research is coordinated as ap-  
6           propriate with relevant Federal agencies.

7   **SEC. 407. RESEARCH ON NEXTGEN AIRSPACE MANAGE-**  
8                           **MENT CONCEPTS AND TOOLS.**

9           (a) IN GENERAL.—The Administrator shall, in con-  
10          sultation with other Federal agencies, review at least an-  
11          nually the alignment and timing of the Administration’s  
12          research and development activities in support of the  
13          NextGen airspace management modernization initiative,  
14          and shall make any necessary adjustments by  
15          reprioritizing or retargeting the Administration’s research  
16          and development activities in support of the NextGen ini-  
17          tiative.

18          (b) ANNUAL REPORTS.—The Administrator shall re-  
19          port to the Committee on Science, Space, and Technology  
20          of the House of Representatives and the Committee on  
21          Commerce, Science, and Transportation of the Senate an-  
22          nually regarding the progress of the Administration’s re-  
23          search and development activities in support of the  
24          NextGen airspace management modernization initiative,  
25          including details of technologies transferred to relevant

1 Federal agencies for eventual operation implementation,  
2 consultation with other Federal agencies, and any adjust-  
3 ments made to research activities.

4 **SEC. 408. ROTORCRAFT RESEARCH.**

5 Not later than 1 year after the date of enactment  
6 of this Act, the Administrator, in consultation with other  
7 Federal agencies, shall prepare and transmit to the Com-  
8 mittee on Science, Space, and Technology of the House  
9 of Representatives and the Committee on Commerce,  
10 Science, and Transportation of the Senate a roadmap for  
11 research relating to rotorcraft and other runway-inde-  
12 pendent air vehicles, with the objective of developing and  
13 demonstrating improved safety, noise, and environmental  
14 impact in a relevant environment. The roadmap shall in-  
15 clude specific goals for the research, a timeline for imple-  
16 mentation, metrics for success, and guidelines for collabo-  
17 ration and coordination with industry and other Federal  
18 agencies.

19 **SEC. 409. TRANSFORMATIVE AERONAUTICS RESEARCH.**

20 It is the sense of Congress that the Administrator,  
21 in looking strategically into the future and ensuring that  
22 the Administration's Center personnel are at the leading  
23 edge of aeronautics research, should encourage investiga-  
24 tions into the early-stage advancement of new processes,  
25 novel concepts, and innovative technologies that have the

1 potential to meet national aeronautics needs. The Admin-  
2 istrator shall continue to ensure that awards for the inves-  
3 tigation of these concepts and technologies are open for  
4 competition among Administration civil servants at its  
5 Centers, separate from other awards open only to non-Ad-  
6 ministration sources.

7 **SEC. 410. STUDY OF UNITED STATES LEADERSHIP IN AERO-**  
8 **NAUTICS RESEARCH.**

9 (a) STUDY.—The Administrator shall enter into an  
10 arrangement with the National Academies for a study to  
11 benchmark the position of the United States in civil aero-  
12 nautics research compared to the rest of the world. The  
13 study shall—

14 (1) seek to define metrics by which relative  
15 leadership in civil aeronautics research can be deter-  
16 mined;

17 (2) ascertain how the United States compares  
18 to other countries in the field of civil aeronautics re-  
19 search and any relevant trends; and

20 (3) provide recommendations on what can be  
21 done to regain or retain global leadership, includ-  
22 ing—

23 (A) identifying research areas where  
24 United States expertise has been or is at risk  
25 of being overtaken;

1 (B) defining appropriate roles for the Ad-  
2 ministration;

3 (C) identifying public-private partnerships  
4 that could be formed; and

5 (D) estimating the impact on the Adminis-  
6 tration's budget should such recommendations  
7 be implemented.

8 (b) REPORT.—Not later than 18 months after the  
9 date of enactment of this Act, the Administrator shall pro-  
10 vide the results of the study to the Committee on Science,  
11 Space, and Technology of the House of Representatives  
12 and the Committee on Commerce, Science, and Transpor-  
13 tation of the Senate.

## 14 **TITLE V—SPACE TECHNOLOGY**

### 15 **SEC. 501. SENSE OF CONGRESS.**

16 It is the sense of Congress that space technology is  
17 critical to—

18 (1) enabling a new class of Administration mis-  
19 sions beyond low-Earth orbit;

20 (2) developing technologies and capabilities that  
21 will make the Administration's missions more afford-  
22 able and more reliable; and

23 (3) improving technological capabilities and pro-  
24 moting innovation for the Administration and the  
25 Nation.

1 **SEC. 502. SPACE TECHNOLOGY PROGRAM.**

2 (a) AMENDMENT.—Section 70507 of title 51, United  
3 States Code, is amended to read as follows:

4 **“§ 70507. Space Technology Program authorized**

5 “(a) PROGRAM AUTHORIZED.—The Administrator  
6 shall establish a Space Technology Program to pursue the  
7 research and development of advanced space technologies  
8 that have the potential of delivering innovative solutions  
9 and to support human exploration of the solar system or  
10 advanced space science. The program established by the  
11 Administrator shall take into consideration the rec-  
12 ommendations of the National Academies’ review of the  
13 Administration’s Space Technology roadmaps and prior-  
14 ities, as well as applicable enabling aspects of the Human  
15 Exploration Roadmap specified in section 70504. In con-  
16 ducting the space technology program established under  
17 this section, the Administrator shall—

18 “(1) to the maximum extent practicable, use a  
19 competitive process to select projects to be supported  
20 as part of the program;

21 “(2) make use of small satellites and the Ad-  
22 ministration’s suborbital and ground-based plat-  
23 forms, to the extent practicable and appropriate, to  
24 demonstrate space technology concepts and develop-  
25 ments; and

1           “(3) undertake partnerships with other Federal  
2           agencies, universities, private industry, and other  
3           spacefaring nations, as appropriate.

4           “(b) SMALL BUSINESS PROGRAMS.—The Adminis-  
5           trator shall organize and manage the Administration’s  
6           Small Business Innovation Research program and Small  
7           Business Technology Transfer Program within the Space  
8           Technology Program.

9           “(c) NONDUPLICATION CERTIFICATION.—The Ad-  
10          ministrators shall include in the budget for each fiscal year,  
11          as transmitted to Congress under section 1105(a) of title  
12          31, a certification that no project, program, or mission  
13          undertaken by the Space Technology Program is duplica-  
14          tive of any other project, program, or mission conducted  
15          by another office or directorate of the Administration.”.

16          (b) COLLABORATION, COORDINATION, AND ALIGN-  
17          MENT.—The Administrator shall ensure that the Adminis-  
18          tration’s projects, programs, and activities in support of  
19          technology research and development of advanced space  
20          technologies are fully coordinated and aligned and that re-  
21          sults from such work are shared and leveraged within the  
22          Administration. Projects, programs, and activities being  
23          conducted by the Human Exploration and Operations Mis-  
24          sion Directorate in support of research and development  
25          of advanced space technologies and systems focusing on

1 human space exploration should continue in that Direc-  
2 torate. The Administrator shall ensure that organizational  
3 responsibility for research and development activities in  
4 support of human space exploration not initiated as of the  
5 date of enactment of this Act is established on the basis  
6 of a sound rationale. The Administrator shall provide the  
7 rationale in the report specified in subsection (d).

8       (c) REPORT.—Not later than 180 days after the date  
9 of enactment of this Act, the Administrator shall provide  
10 to the Committee on Science, Space, and Technology of  
11 the House of Representatives and the Committee on Com-  
12 merce, Science, and Transportation of the Senate a report  
13 comparing the Administration’s space technology invest-  
14 ments with the high-priority technology areas identified by  
15 the National Academies in the National Research Coun-  
16 cil’s report on the Administration’s Space Technology  
17 Roadmaps. The Administrator shall identify how the Ad-  
18 ministration will address any gaps between the agency’s  
19 investments and the recommended technology areas, in-  
20 cluding a projection of funding requirements.

21       (d) ANNUAL REPORT.—The Administrator shall in-  
22 clude in the Administration’s annual budget request for  
23 each fiscal year the rationale for assigning organizational  
24 responsibility for, in the year prior to the budget fiscal  
25 year, each initiated project, program, and mission focused

1 on research and development of advanced technologies for  
 2 human space exploration.

3 (e) TABLE OF SECTIONS AMENDMENT.—The item  
 4 relating to section 70507 in the table of sections for chap-  
 5 ter 705 of title 51, United States Code, is amended to  
 6 read as follows:

“70507. Space Technology Program authorized.”.

7 **SEC. 503. UTILIZATION OF THE INTERNATIONAL SPACE**  
 8 **STATION FOR TECHNOLOGY DEMONSTRA-**  
 9 **TIONS.**

10 The Administrator shall utilize the International  
 11 Space Station and commercial services for space tech-  
 12 nology demonstration missions in low-Earth orbit when-  
 13 ever it is practical and cost effective to do so.

14 **TITLE VI—EDUCATION**

15 **SEC. 601. EDUCATION.**

16 (a) SENSE OF CONGRESS.—It is the sense of Con-  
 17 gress that—

18 (1) the Administration’s missions are an inspi-  
 19 ration for Americans and in particular for the next  
 20 generation, and that this inspiration has a powerful  
 21 effect in stimulating interest in science, technology,  
 22 engineering, and mathematics (in this section re-  
 23 ferred to as “STEM”) education and careers;

24 (2) the Administration’s Office of Education  
 25 and mission directorates have been effective in deliv-



1       ering Administration educational content because of  
2       the strong engagement of Administration scientists  
3       and engineers in the Administration’s education and  
4       outreach activities; and

5               (3) the Administration should be a central part-  
6       ner in contributing to the goals of the National  
7       Science and Technology Council’s Federal Science,  
8       Technology, Engineering, and Mathematics (STEM)  
9       Education 5-Year Strategic Plan.

10       (b) IN GENERAL.—The Administration shall continue  
11       its education and outreach efforts to—

12               (1) increase student interest and participation  
13       in STEM education;

14               (2) improve public literacy in STEM;

15               (3) employ proven strategies for improving stu-  
16       dent learning and teaching;

17               (4) provide curriculum support materials; and

18               (5) create and support opportunities for profes-  
19       sional development for STEM teachers.

20       (c) ORGANIZATION.—In order to ensure the inspira-  
21       tion and engagement of children and the general public,  
22       the Administration shall continue its STEM education and  
23       outreach activities within the Science, Aeronautics Re-  
24       search, Space Operations, and Exploration Mission Direc-  
25       torates.

1       (d) CONTINUATION OF EDUCATION AND OUTREACH  
2 ACTIVITIES AND PROGRAMS.—The Administrator shall  
3 continue to carry out education and outreach programs  
4 and activities through the Office of Education and the Ad-  
5 ministration mission directorates and shall continue to en-  
6 gage, to the maximum extent practicable, Administration  
7 and Administration-supported researchers and engineers  
8 in carrying out those programs and activities.

9       (e) CONTINUATION OF SPACE GRANT PROGRAM.—  
10 The Administrator shall continue to operate the National  
11 Space Grant College and Fellowship program through a  
12 national network consisting of a State-based consortium  
13 in each State that provides flexibility to the States, with  
14 the objective of providing hands-on research, training, and  
15 education programs, with measurable outcomes, to en-  
16 hance America’s STEM education and workforce.

17       (f) REAFFIRMATION OF POLICY.—Congress reaffirms  
18 its commitment to informal science education at science  
19 centers and planetariums as set forth in section 616 of  
20 the National Aeronautics and Space Administration Au-  
21 thorization Act of 2005 (51 U.S.C. 40907).

1 **SEC. 602. INDEPENDENT REVIEW OF THE NATIONAL SPACE**  
2 **GRANT COLLEGE AND FELLOWSHIP PRO-**  
3 **GRAM.**

4 (a) SENSE OF CONGRESS.—It is the sense of Con-  
5 gress that the National Space Grant College and Fellow-  
6 ship Program, which was established in the National Aero-  
7 nautics and Space Administration Authorization Act of  
8 1988 (42 U.S.C. 2486 et seq.), has been an important  
9 program by which the Federal Government has partnered  
10 with State and local governments, universities, private in-  
11 dustry, and other organizations to enhance the under-  
12 standing and use of space and aeronautics activities and  
13 their benefits through education, fostering of interdiscipli-  
14 nary and multidisciplinary space research and training,  
15 and supporting Federal funding for graduate fellowships  
16 in space-related fields, among other purposes.

17 (b) REVIEW.—The Administrator shall enter into an  
18 arrangement with the National Academies for—

19 (1) a review of the National Space Grant Col-  
20 lege and Fellowship Program, including its structure  
21 and capabilities for supporting science, technology,  
22 engineering, and mathematics education and train-  
23 ing consistent with the National Science and Tech-  
24 nology Council’s Federal Science, Technology, Engi-  
25 neering, and Mathematics (STEM) Education 5-  
26 Year Strategic Plan; and

1           (2) recommendations on measures, if needed, to  
2       enhance the Program’s effectiveness and mecha-  
3       nisms by which any increases in funding appro-  
4       priated by Congress can be applied.

5       (c) NATIONAL SPACE GRANT COLLEGE AND FEL-  
6       LOWSHIP PROGRAM AMENDMENTS.—

7           (1) PURPOSES.—Section 40301 of title 51,  
8       United States Code, is amended—

9               (A) by striking “and” at the end of para-  
10       graph (5);

11              (B) by striking the period at the end of  
12       paragraph (6) and inserting “; and”; and

13              (C) by adding at the end the following new  
14       paragraph:

15           “(7) support outreach to primary and sec-  
16       ondary schools to help support STEM engagement  
17       and learning at the K–12 level and to encourage K–  
18       12 students to pursue postsecondary degrees in  
19       fields related to space.”.

20       (2) REGIONAL CONSORTIUM.—Section 40306 of  
21       title 51, United States Code, is amended—

22           (A) in subsection (a)—

23               (i) by redesignating paragraphs (2)  
24       and (3) as paragraphs (3) and (4), respec-  
25       tively; and

1 (ii) by inserting after paragraph (1)  
 2 the following new paragraph:

3 “(2) INCLUSION OF 2-YEAR INSTITUTIONS.—A  
 4 space grant regional consortium designated in para-  
 5 graph (1)(B) may include one or more 2-year insti-  
 6 tutions of higher education.”; and

7 (B) in subsection (b)(1), by striking “para-  
 8 graphs (2)(C) and (3)(D)” and inserting “para-  
 9 graphs (3)(C) and (4)(D)”.

10 **SEC. 603. SENSE OF CONGRESS.**

11 It is the sense of Congress that the Administrator  
 12 should make the continuation of the Administration’s Mi-  
 13 nority University Research and Education Program a pri-  
 14 ority in order to further STEM education for underrep-  
 15 resented students.

16 **TITLE VII—POLICY PROVISIONS**

17 **SEC. 701. ASTEROID RETRIEVAL MISSION.**

18 (a) ASTEROID RETRIEVAL REPORT.—Not later than  
 19 180 days after the date of enactment of this Act, the Ad-  
 20 ministrator shall provide to the Committee on Science,  
 21 Space, and Technology of the House of Representatives  
 22 and the Committee on Commerce, Science, and Transpor-  
 23 tation of the Senate a report on the proposed Asteroid  
 24 Retrieval Mission. Such report shall include—

1           (1) a detailed budget profile, including cost esti-  
2           mates for the development of all necessary tech-  
3           nologies and spacecraft required for the mission;

4           (2) a detailed technical plan that includes mile-  
5           stones and a specific schedule;

6           (3) a description of the technologies and capa-  
7           bilities anticipated to be gained from the proposed  
8           mission that will enable future human missions to  
9           Mars which could not be gained by lunar missions;

10          (4) a description of the technologies and capa-  
11          bilities anticipated to be gained from the proposed  
12          mission that will enable future planetary defense  
13          missions, against impact threats from near-Earth  
14          objects equal to or greater than 140 meters in di-  
15          ameter, which could not be gained by robotic mis-  
16          sions; and

17          (5) a complete assessment by the Small Bodies  
18          Assessment Group and the National Aeronautics and  
19          Space Administration Advisory Council of how the  
20          proposed mission is or is not in the strategic inter-  
21          ests of the United States in space exploration.

22          (b) MARS FLYBY REPORT.—Not later than 60 days  
23          after the date of enactment of this Act, an independent,  
24          private systems engineering and technical assistance orga-  
25          nization contracted by the Human Exploration Operations

1 Mission Directorate shall transmit to the Administrator,  
2 the Committee on Science, Space, and Technology of the  
3 House of Representatives, and the Committee on Commerce,  
4 Science, and Transportation of the Senate a report  
5 analyzing the proposal for a Mars Flyby human  
6 spaceflight mission to be launched in 2021. Such report  
7 shall include—

8           (1) a technical development, test, fielding, and  
9           operations plan using the Space Launch System and  
10          other systems to successfully mount a Mars Flyby  
11          mission by 2021;

12          (2) a description of the benefits in scientific  
13          knowledge and technologies demonstrated by a Mars  
14          Flyby mission to be launched in 2021 suitable for  
15          future Mars missions; and

16          (3) an annual budget profile, including cost estimates,  
17          for the development test, fielding, and operations plan to carry out a Mars Flyby mission  
18          through 2021 and comparison of that budget profile  
19          to the 5-year budget profile contained in the President's Budget request for fiscal year 2017.

22          (c) ASSESSMENT.—Not later than 60 days after  
23 transmittal of the report specified in subsection (b), the  
24 Administrator shall transmit to the Committee on Science,  
25 Space, and Technology of the House of Representatives

1 and the Committee on Commerce, Science, and Transpor-  
2 tation of the Senate an assessment by the National Aero-  
3 nautics and Space Administration Advisory Council of  
4 whether the proposal for a Mars Flyby Mission to be  
5 launched in 2021 is in the strategic interests of the United  
6 States in space exploration.

7 (d) CREWED MISSION.—The report transmitted  
8 under subsection (b) may consider a crewed mission with  
9 the Space Launch System in cis-lunar space prior to the  
10 Mars Flyby mission in 2021.

11 **SEC. 702. TERMINATION LIABILITY SENSE OF CONGRESS.**

12 It is the sense of Congress that:

13 (1) The International Space Station, the Space  
14 Launch System, and the Orion crew vehicle will en-  
15 able the Nation to continue operations in low-Earth  
16 orbit and to send its astronauts to deep space. The  
17 James Webb Space Telescope will revolutionize our  
18 understanding of star and planet formation and how  
19 galaxies evolved and advance the search for the ori-  
20 gins of our universe. As a result of their unique ca-  
21 pabilities and their critical contribution to the future  
22 of space exploration, these systems have been des-  
23 ignated by Congress and the Administration as pri-  
24 ority investments.



1           (2) In addition, contractors are currently hold-  
2           ing program funding, estimated to be in the hun-  
3           dreds of millions of dollars, to cover the potential  
4           termination liability should the Government choose  
5           to terminate a program for convenience. As a result,  
6           hundreds of millions of taxpayer dollars are unavail-  
7           able for meaningful work on these programs.

8           (3) According to the Government Accountability  
9           Office, the Administration procures most of its  
10          goods and services through contracts, and it termi-  
11          nates very few of them. In fiscal year 2010, the Ad-  
12          ministration terminated 28 of 16,343 active con-  
13          tracts and orders—a termination rate of about 0.17  
14          percent.

15          (4) The Administration should vigorously pur-  
16          sue a policy on termination liability that maximizes  
17          the utilization of its appropriated funds to make  
18          maximum progress in meeting established technical  
19          goals and schedule milestones on these high-priority  
20          programs.

21 **SEC. 703. BASELINE AND COST CONTROLS.**

22          Section 30104 of title 51, United States Code, is  
23          amended—

24                (1) in subsection (a)(1), by striking “Proce-  
25          dural Requirements 7120.5c, dated March 22,

1       2005” and inserting “Procedural Requirements  
2       7120.5E, dated August 14, 2012”; and

3               (2) in subsection (f), by striking “beginning 18  
4       months after the date the Administrator transmits a  
5       report under subsection (e)(1)(A)” and inserting  
6       “beginning 18 months after the Administrator  
7       makes such determination”.

8       **SEC. 704. PROJECT AND PROGRAM RESERVES.**

9       (a) SENSE OF CONGRESS.—It is the sense of Con-  
10      gress that the judicious use of program and project re-  
11      serves provides the Administration’s project and program  
12      managers with the flexibility needed to manage projects  
13      and programs to ensure that the impacts of contingencies  
14      can be mitigated.

15      (b) REPORT.—Not later than 180 days after the date  
16      of enactment of this Act the Administrator shall transmit  
17      to the Committee on Science, Space, and Technology of  
18      the House of Representatives and the Committee on Com-  
19      merce, Science, and Transportation of the Senate a report  
20      describing—

21              (1) the Administration’s criteria for establishing  
22      the amount of reserves held at the project and pro-  
23      gram levels;

1           (2) how such criteria relate to the agency's pol-  
2       icy of budgeting at a 70-percent confidence level;  
3       and

4           (3) the Administration's criteria for waiving the  
5       policy of budgeting at a 70-percent confidence level  
6       and alternative strategies and mechanisms aimed at  
7       controlling program and project costs when a waiver  
8       is granted.

9   **SEC. 705. INDEPENDENT REVIEWS.**

10       Not later than 270 days after the date of enactment  
11   of this Act, the Administrator shall transmit to the Com-  
12   mittee on Science, Space, and Technology of the House  
13   of Representatives and the Committee on Commerce,  
14   Science, and Transportation of the Senate a report de-  
15   scribing—

16           (1) the Administration's procedures for con-  
17       ducting independent reviews of projects and pro-  
18       grams at lifecycle milestones and how the Adminis-  
19       tration ensures the independence of the individuals  
20       who conduct those reviews prior to their assignment;

21           (2) the internal and external entities inde-  
22       pendent of project and program management that  
23       conduct reviews of projects and programs at life  
24       cycle milestones; and

1           (3) how the Administration ensures the inde-  
2           pendence of such entities and their members.

3 **SEC. 706. COMMERCIAL TECHNOLOGY TRANSFER PRO-**  
4 **GRAM.**

5           Section 50116(a) of title 51, United States Code, is  
6 amended by inserting “, while protecting national secu-  
7 rity” after “research community”.

8 **SEC. 707. NATIONAL AERONAUTICS AND SPACE ADMINIS-**  
9 **TRATION ADVISORY COUNCIL.**

10          (a) STUDY.—The Administrator shall enter into an  
11 arrangement with the National Academy of Public Admin-  
12 istration to assess the effectiveness of the NASA Advisory  
13 Council and to make recommendations to Congress for  
14 any change to—

- 15           (1) the functions of the Council;  
16           (2) the appointment of members to the Council;  
17           (3) qualifications for members of the Council;  
18           (4) duration of terms of office for members of  
19           the Council;  
20           (5) frequency of meetings of the Council;  
21           (6) the structure of leadership and Committees  
22           of the Council; and  
23           (7) levels of professional staffing for the Coun-  
24           cil.

1 In carrying out the assessment, the Academy shall also  
2 assess the impacts of broadening the Council's role to ad-  
3 vising Congress, and any other issues that the Academy  
4 determines could potentially impact the effectiveness of  
5 the Council. The Academy shall consider the past activities  
6 of the NASA Advisory Council, as well as the activities  
7 of other analogous Federal advisory bodies in conducting  
8 its assessment. The results of the assessment, including  
9 any recommendations, shall be transmitted to the Com-  
10 mittee on Science, Space, and Technology of the House  
11 of Representatives and the Committee on Commerce,  
12 Science, and Transportation of the Senate.

13 (b) CONSULTATION AND ADVICE.—Section 20113(g)  
14 of title 51, United States Code, is amended by inserting  
15 “and Congress” after “advice to the Administration”.

16 (c) SUNSET.—Effective on September 30, 2016, sec-  
17 tion 20113(g) of title 51, United States Code, is amended  
18 by striking “and Congress”.

19 **SEC. 708. COST ESTIMATION.**

20 (a) SENSE OF CONGRESS.—It is the sense of Con-  
21 gress that realistic cost estimating is critically important  
22 to the ultimate success of major space development  
23 projects. The Administration has devoted significant ef-  
24 forts over the past 5 years to improving its cost estimating  
25 capabilities, but it is important that the Administration

1 continue its efforts to develop and implement guidance in  
2 establishing realistic cost estimates.

3 (b) GUIDANCE AND CRITERIA.—The Administrator  
4 shall provide to programs and projects, and in a manner  
5 consistent with the Administration’s Space Flight Pro-  
6 gram and Project Management Requirements—

7 (1) guidance on when an Independent Cost Es-  
8 timate and Independent Cost Assessment should be  
9 used; and

10 (2) the criteria to be used to make such a de-  
11 termination.

12 (c) REPORT.—Not later than 270 days after the date  
13 of enactment of this Act, the Administrator shall transmit  
14 to the Committee on Science, Space, and Technology of  
15 the House of Representatives and the Committee on Com-  
16 merce, Science, and Transportation of the Senate a re-  
17 port—

18 (1) describing efforts to enhance internal cost  
19 estimation and assessment expertise;

20 (2) describing the mechanisms the Administra-  
21 tion is using and will continue to use to ensure that  
22 adequate resources are dedicated to cost estimation;

23 (3) listing the steps the Administration is un-  
24 dertaking to advance consistent implementation of  
25 the joint cost and schedule process;

1 (4) identifying criteria used by programs and  
2 projects in determining when to conduct an Inde-  
3 pendent Cost Estimate and Independent Cost As-  
4 sessment; and

5 (5) listing—

6 (A) the costs of each individual Inde-  
7 pendent Cost Estimate or Independent Cost As-  
8 sessment activity conducted in fiscal year 2012,  
9 fiscal year 2013, fiscal year 2014, and fiscal  
10 year 2015;

11 (B) the purpose of the activity;

12 (C) identification of the primary Adminis-  
13 tration unit or outside body that conducted the  
14 activity; and

15 (D) key findings and recommendations.

16 (d) UPDATED REPORT.—Subsequent to submission  
17 of the report under subsection (c), for each subsequent  
18 year, the Administrator shall provide an update of listed  
19 elements in conjunction with subsequent congressional  
20 budget justifications.

21 **SEC. 709. AVOIDING ORGANIZATIONAL CONFLICTS OF IN-**  
22 **TEREST IN MAJOR ADMINISTRATION ACQUI-**  
23 **SITION PROGRAMS.**

24 (a) REVISED REGULATIONS REQUIRED.—Not later  
25 than 270 days after the date of enactment of this Act,

1 the Administrator shall revise the Administration Supple-  
2 ment to the Federal Acquisition Regulation to provide uni-  
3 form guidance and recommend revised requirements for  
4 organizational conflicts of interest by contractors in major  
5 acquisition programs in order to address elements identi-  
6 fied in subsection (b).

7 (b) ELEMENTS.—The revised regulations required by  
8 subsection (a) shall, at a minimum—

9 (1) address organizational conflicts of interest  
10 that could potentially arise as a result of—

11 (A) lead system integrator contracts on  
12 major acquisition programs and contracts that  
13 follow lead system integrator contracts on such  
14 programs, particularly contracts for production;

15 (B) the ownership of business units per-  
16 forming systems engineering and technical as-  
17 sistance functions, professional services, or  
18 management support services in relation to  
19 major acquisition programs by contractors who  
20 simultaneously own business units competing to  
21 perform as either the prime contractor or the  
22 supplier of a major subsystem or component for  
23 such programs;

24 (C) the award of major subsystem con-  
25 tracts by a prime contractor for a major acqui-



sition program to business units or other affiliates of the same parent corporate entity, and particularly the award of subcontracts for software integration or the development of a proprietary software system architecture; or

(D) the performance by, or assistance of, contractors in technical evaluations on major acquisition programs;

(2) ensure that the Administration receives advice on systems architecture and systems engineering matters with respect to major acquisition programs from objective sources independent of the prime contractor;

(3) require that a contract for the performance of systems engineering and technical assistance functions for a major acquisition program contains a provision prohibiting the contractor or any affiliate of the contractor from participating as a prime contractor or a major subcontractor in the development of a system under the program; and

(4) establish such limited exceptions to the requirement in paragraphs (2) and (3) as may be necessary to ensure that the Administration has continued access to advice on systems architecture and systems engineering matters from highly qualified

1 contractors with domain experience and expertise,  
2 while ensuring that such advice comes from sources  
3 that are objective and unbiased.

4 **SEC. 710. FACILITIES AND INFRASTRUCTURE.**

5 (a) SENSE OF CONGRESS.—It is the sense of Con-  
6 gress that—

7 (1) the Administration must reverse the deterio-  
8 rating condition of its facilities and infrastructure,  
9 as this condition is hampering the effectiveness and  
10 efficiency of research performed by both the Admin-  
11 istration and industry participants making use of  
12 Administration facilities, thus reducing the competi-  
13 tiveness of the United States aerospace industry;

14 (2) the Administration has a role in providing  
15 laboratory capabilities that are not available else-  
16 where to industry participants that are economically  
17 viable as commercial entities;

18 (3) to ensure continued access to reliable and  
19 efficient world-class facilities by researchers, the Ad-  
20 ministration should seek to establish strategic part-  
21 nerships with other Federal agencies, academic insti-  
22 tutions, and industry, as appropriate; and

23 (4) decisions on whether to dispose of, main-  
24 tain, or modernize existing facilities must be made  
25 in the context of meeting future Administration and

1       other Federal agencies' laboratory needs, including  
2       those required to meet the activities supporting the  
3       Human Exploration Roadmap required by section  
4       70504 of title 51, United States Code, as added by  
5       section 202 of this Act.

6       (b) POLICY.—It is the policy of the United States  
7       that the Administration maintain reliable and efficient fa-  
8       cilities and that decisions on whether to dispose of, main-  
9       tain, or modernize existing facilities be made in the con-  
10      text of meeting future Administration needs.

11      (c) PLAN.—The Administrator shall develop a plan  
12      that has the goal of positioning the Administration to have  
13      the facilities, laboratories, tools, and approaches necessary  
14      to address future Administration requirements. Such plan  
15      shall identify—

16           (1) future Administration research and develop-  
17      ment and testing needs;

18           (2) a strategy for identifying facilities that are  
19      candidates for disposal, that is consistent with the  
20      national strategic direction set forth in—

21           (A) the National Space Policy;

22           (B) the National Aeronautics Research,  
23      Development, Test, and Evaluation Infrastruc-  
24      ture Plan;

1 (C) National Aeronautics and Space Ad-  
2 ministration Authorization Acts; and

3 (D) the Human Exploration Roadmap  
4 specified in section 70504 of title 51, United  
5 States Code, as added by section 202 of this  
6 Act;

7 (3) a strategy for the maintenance, repair, up-  
8 grading, and modernization of the Administration's  
9 laboratories, facilities, and equipment;

10 (4) criteria for prioritizing deferred mainte-  
11 nance tasks and also for upgrading or modernizing  
12 laboratories, facilities, and equipment and imple-  
13 menting processes, plans, and policies for guiding  
14 the Administration's Centers on whether to main-  
15 tain, repair, upgrade, or modernize a facility and for  
16 determining the type of instrument to be used;

17 (5) an assessment of modifications needed to  
18 maximize usage of facilities that offer unique and  
19 highly specialized benefits to the aerospace industry  
20 and the American public;

21 (6) barriers, if any, to the application of exist-  
22 ing Working Capital Fund authorities that would  
23 enable to the maximum extent practicable that all fi-  
24 nancial savings achieved by closing outdated or sur-  
25 plus facilities at an Administration Center be made

1 available to that Center for the purpose of modern-  
2 izing the Center’s facilities and laboratories and for  
3 upgrading the infrastructure at the Center; and

4 (7) implementation steps, including a timeline,  
5 milestones, and an estimate of resources, required  
6 for carrying out the plan.

7 (d) POLICY.—Not later than 180 days after the date  
8 of enactment of this Act, the Administrator shall establish  
9 and make publically available a policy that guides the Ad-  
10 ministration’s use of existing authorities to out-grant,  
11 lease, excess to the General Services Administration, sell,  
12 decommission, demolish, or otherwise transfer property,  
13 facilities, or infrastructure. This policy shall establish cri-  
14 teria for the use of authorities, best practices, standard-  
15 ized procedures, and guidelines for how to appropriately  
16 manage property, infrastructure, and facilities.

17 (e) TRANSMITTAL.—Not later than one year after the  
18 date of enactment of this Act, the Administrator shall  
19 transmit the plan developed under subsection (c) to the  
20 Committee on Science, Space, and Technology of the  
21 House of Representatives and the Committee on Com-  
22 merce, Science, and Transportation of the Senate.

23 **SEC. 711. DETECTION AND AVOIDANCE OF COUNTERFEIT**  
24 **ELECTRONIC PARTS.**

25 (a) REGULATIONS.—

1           (1) IN GENERAL.—Not later than 270 days  
2       after the date of enactment of this Act, the Adminis-  
3       trator shall revise the National Aeronautics and  
4       Space Administration Supplement to the Federal  
5       Acquisition Regulation to address the detection and  
6       avoidance of counterfeit electronic parts.

7           (2) CONTRACTOR RESPONSIBILITIES.—The re-  
8       vised regulations issued pursuant to paragraph (1)  
9       shall provide that—

10           (A) Administration contractors who supply  
11       electronic parts or products that include elec-  
12       tronic parts are responsible for detecting and  
13       avoiding the use or inclusion of counterfeit elec-  
14       tronic parts or suspect counterfeit electronic  
15       parts in such products and for any rework or  
16       corrective action that may be required to rem-  
17       edy the use or inclusion of such parts; and

18           (B) the cost of counterfeit electronic parts  
19       and suspect counterfeit electronic parts and the  
20       cost of rework or corrective action that may be  
21       required to remedy the use or inclusion of such  
22       parts are not allowable costs under Administra-  
23       tion contracts, unless—

24           (i) the covered contractor has an oper-  
25       ational system to detect and avoid counter-

1           feit parts and suspect counterfeit electronic  
2           parts that has been reviewed and approved  
3           by the Administration or the Department  
4           of Defense;

5                 (ii) the covered contractor provides  
6           timely notice to the Administration pursu-  
7           ant to paragraph (4); or

8                 (iii) the counterfeit electronic parts or  
9           suspect counterfeit electronic parts were  
10          provided to the contractor as Government  
11          property in accordance with part 45 of the  
12          Federal Acquisition Regulation.

13               (3) SUPPLIERS OF ELECTRONIC PARTS.—The  
14          revised regulations issued pursuant to paragraph (1)  
15          shall—

16                (A) require that the Administration and  
17          Administration contractors and subcontractors  
18          at all tiers—

19                       (i) obtain electronic parts that are in  
20          production or currently available in stock  
21          from the original manufacturers of the  
22          parts or their authorized dealers, or from  
23          suppliers who obtain such parts exclusively  
24          from the original manufacturers of the  
25          parts or their authorized dealers; and

1                   (ii) obtain electronic parts that are  
2                   not in production or currently available in  
3                   stock from suppliers that meet qualifica-  
4                   tion requirements established pursuant to  
5                   subparagraph (C);

6                   (B) establish documented requirements  
7                   consistent with published industry standards or  
8                   Government contract requirements for—

9                   (i) notification of the Administration;  
10                  and

11                  (ii) inspection, testing, and authen-  
12                  tication of electronic parts that the Admin-  
13                  istration or an Administration contractor  
14                  or subcontractor obtains from any source  
15                  other than a source described in subpara-  
16                  graph (A);

17                  (C) establish qualification requirements,  
18                  consistent with the requirements of section  
19                  2319 of title 10, United States Code, pursuant  
20                  to which the Administration may identify sup-  
21                  pliers that have appropriate policies and proce-  
22                  dures in place to detect and avoid counterfeit  
23                  electronic parts and suspect counterfeit elec-  
24                  tronic parts; and



1 (D) authorize Administration contractors  
2 and subcontractors to identify and use addi-  
3 tional suppliers beyond those identified pursu-  
4 ant to subparagraph (C) provided that—

5 (i) the standards and processes for  
6 identifying such suppliers comply with es-  
7 tablished industry standards;

8 (ii) the contractor or subcontractor  
9 assumes responsibility for the authenticity  
10 of parts provided by such suppliers as pro-  
11 vided in paragraph (2); and

12 (iii) the selection of such suppliers is  
13 subject to review and audit by appropriate  
14 Administration officials.

15 (4) TIMELY NOTIFICATION.—The revised regu-  
16 lations issued pursuant to paragraph (1) shall re-  
17 quire that any Administration contractor or subcon-  
18 tractor who becomes aware, or has reason to sus-  
19 pect, that any end item, component, part, or mate-  
20 rial contained in supplies purchased by the Adminis-  
21 tration, or purchased by a contractor or subcon-  
22 tractor for delivery to, or on behalf of, the Adminis-  
23 tration, contains counterfeit electronic parts or sus-  
24 pect counterfeit electronic parts, shall provide notifi-

1 cation to the applicable Administration contracting  
2 officer within 30 calendar days.

3 (b) REPORT.—Not later than 120 days after the re-  
4 vised regulations specified in subsection (a) have been im-  
5 plemented, the Administrator shall submit to the Com-  
6 mittee on Science, Space, and Technology of the House  
7 of Representatives and the Committee on Commerce,  
8 Science, and Transportation of the Senate a report updat-  
9 ing the Administration’s actions to prevent counterfeit  
10 electronic parts from entering the supply chain as de-  
11 scribed in its October 2011 report pursuant to section  
12 1206(d) of the National Aeronautics and Space Adminis-  
13 tration Authorization Act of 2010 (42 U.S.C. 18444(d)).

14 (c) DEFINITION.—In this section, the term “elec-  
15 tronic part” means a discrete electronic component, in-  
16 cluding a microcircuit, transistor, capacitor, resistor, or  
17 diode that is intended for use in a safety or mission critical  
18 application.

19 **SEC. 712. SPACE ACT AGREEMENTS.**

20 (a) COST SHARING.—To the extent that the Adminis-  
21 trator determines practicable, the funds provided by the  
22 Government under a funded Space Act Agreement shall  
23 not exceed the total amount provided by other parties to  
24 the Space Act Agreement.

1 (b) NEED.—A funded Space Act Agreement may be  
2 used only when the use of a standard contract, grant, or  
3 cooperative agreement is not feasible or appropriate, as  
4 determined by the Associate Administrator for Procure-  
5 ment.

6 (c) PUBLIC NOTICE AND COMMENT.—The Adminis-  
7 trator shall make available for public notice and comment  
8 each proposed Space Act Agreement at least 30 days be-  
9 fore entering into such agreement, with appropriate  
10 redactions for proprietary, sensitive, or classified informa-  
11 tion.

12 (d) TRANSPARENCY.—The Administrator shall pub-  
13 licly disclose on the Administration’s website and make  
14 available in a searchable format each Space Act Agree-  
15 ment, with appropriate redactions for proprietary, sen-  
16 sitive, or classified information, not later than 60 days  
17 after such agreement is signed.

18 (e) ANNUAL REPORT.—

19 (1) REQUIREMENT.—Not later than 90 days  
20 after the end of each fiscal year, the Administrator  
21 shall submit to the Committee on Science, Space,  
22 and Technology of the House of Representatives and  
23 the Committee on Commerce, Science, and Trans-  
24 portation of the Senate a report on the use of Space

1 Act Agreement authority by the Administration dur-  
2 ing the previous fiscal year.

3 (2) CONTENTS.—The report shall include for  
4 each Space Act Agreement in effect at the time of  
5 the report—

6 (A) an indication of whether the agreement  
7 is a reimbursable, nonreimbursable, or funded  
8 Space Act Agreement;

9 (B) a description of—

10 (i) the subject and terms;

11 (ii) the parties;

12 (iii) the responsible—

13 (I) mission directorate;

14 (II) center; or

15 (III) headquarters element;

16 (iv) the value;

17 (v) the extent of the cost sharing  
18 among Federal Government and non-Fed-  
19 eral sources;

20 (vi) the time period or schedule; and

21 (vii) all milestones; and

22 (C) an indication of whether the agreement  
23 was renewed during the previous fiscal year.

24 (3) ANTICIPATED AGREEMENTS.—The report  
25 shall also include a list of all anticipated reimburs-

1       able, nonreimbursable, and funded Space Act Agree-  
2       ments for the upcoming fiscal year.

3           (4) CUMULATIVE PROGRAM BENEFITS.—The  
4       report shall also include, with respect to the Space  
5       Act Agreements covered by the report, a summary  
6       of—

7           (A) the technology areas in which research  
8       projects were conducted under such agreements;

9           (B) the extent to which the use of the  
10      Space Act Agreements—

11           (i) has contributed to a broadening of  
12      the technology and industrial base avail-  
13      able for meeting Administration needs; and

14           (ii) has fostered within the technology  
15      and industrial base new relationships and  
16      practices that support the United States;  
17      and

18           (C) the total amount of value received by  
19      the Federal Government during the fiscal year  
20      pursuant to such Space Act Agreements.

21 **SEC. 713. HUMAN SPACEFLIGHT ACCIDENT INVESTIGA-**  
22 **TIONS.**

23       Section 70702(a) of title 51, United States Code, is  
24       amended by striking paragraph (3) and inserting the fol-  
25       lowing:

1           “(3) any other orbital or suborbital space vehi-  
2       cle carrying humans—

3           “(A) that is owned by the Federal Govern-  
4       ment; or

5           “(B) that is being used pursuant to a con-  
6       tract or Space Act Agreement, as defined in  
7       section 2 of the National Aeronautics and  
8       Space Administration Authorization Act for  
9       2016 and 2017, with the Federal Government  
10      for carrying a researcher or payload funded by  
11      the Federal Government; or”.

12 **SEC. 714. FULLEST COMMERCIAL USE OF SPACE.**

13       (a) REPORT.—Not later than 90 days after the date  
14 of enactment of this Act, the Administrator shall transmit  
15 to the Committee on Science, Space, and Technology of  
16 the House of Representatives and the Committee on Com-  
17 merce, Science, and Transportation of the Senate a report  
18 on current and continuing efforts by the Administration  
19 to “seek and encourage, to the maximum extent possible,  
20 the fullest commercial use of space,” as described in sec-  
21 tion 20102(c) of title 51, United States Code.

22       (b) ELEMENTS.—The report required under sub-  
23 section (a) shall include—

24           (1) an assessment of the Administration’s ef-  
25       forts to comply with the policy;

1           (2) an explanation of criteria used to define  
2       compliance;

3           (3) a description of programs, policies, and ac-  
4       tivities the Administration is using, and will continue  
5       to use, to ensure compliance;

6           (4) an explanation of how the Administration  
7       could expand on the efforts to comply; and

8           (5) a summary of all current and planned ac-  
9       tivities pursuant to this policy.

10       (c) BARRIERS TO FULLEST COMMERCIAL USE OF  
11   SPACE.—Not later than 90 days after the date of enact-  
12   ment of this Act, the Administrator shall transmit to the  
13   Committee on Science, Space, and Technology of the  
14   House of Representatives and the Committee on Com-  
15   merce, Science, and Transportation of the Senate a report  
16   on current and continuing efforts by the Administration  
17   to reduce impediments, bureaucracy, redundancy, and  
18   burdens to ensure the fullest commercial use of space as  
19   required by section 20102(c) of title 51, United States  
20   Code.

21   **SEC. 715. ORBITAL DEBRIS.**

22       (a) FINDINGS.—Congress finds that orbital debris  
23   poses serious risks to the operational space capabilities of  
24   the United States and that an international commitment  
25   and integrated strategic plan are needed to mitigate the

1 growth of orbital debris wherever possible. Congress finds  
2 the delay in the Office of Science and Technology Policy's  
3 submission of a report on the status of international co-  
4 ordination and development of mitigation strategies to be  
5 inconsistent with such risks.

6 (b) REPORTS.—

7 (1) COORDINATION.—Not later than 90 days  
8 after the date of enactment of this Act, the Adminis-  
9 trator shall provide the Committee on Science,  
10 Space, and Technology of the House of Representa-  
11 tives and the Committee on Commerce, Science, and  
12 Transportation of the Senate with a report on the  
13 status of efforts to coordinate with countries within  
14 the Inter-Agency Space Debris Coordination Com-  
15 mittee to mitigate the effects and growth of orbital  
16 debris as required by section 1202(b)(1) of the Na-  
17 tional Aeronautics and Space Administration Au-  
18 thorization Act of 2010 (42 U.S.C. 18441(b)(1)).

19 (2) MITIGATION STRATEGY.—Not later than 90  
20 days after the date of enactment of this Act, the Di-  
21 rector of the Office of Science and Technology Policy  
22 shall provide the Committee on Science, Space, and  
23 Technology of the House of Representatives and the  
24 Committee on Commerce, Science, and Transpor-  
25 tation of the Senate with a report on the status of



1 the orbital debris mitigation strategy required under  
2 section 1202(b)(2) of the National Aeronautics and  
3 Space Administration Authorization Act of 2010 (42  
4 U.S.C. 18441(b)(2)).

5 **SEC. 716. REVIEW OF ORBITAL DEBRIS REMOVAL CON-**  
6 **CEPTS.**

7 (a) SENSE OF CONGRESS.—It is the sense of Con-  
8 gress that the amount of orbital debris in low-Earth orbit  
9 poses risks for human activities and robotic spacecraft and  
10 that this debris may increase due to collisions between ex-  
11 isting debris objects. Understanding options to address  
12 and remove orbital debris is important for ensuring safe  
13 and effective spacecraft operations in low-Earth orbit.

14 (b) REVIEW.—The Administrator, in collaboration  
15 with other relevant Federal agencies, shall solicit and re-  
16 view concepts and technological options for removing or-  
17 bital debris from low-Earth orbit. The solicitation and re-  
18 view shall also address the requirements for and feasibility  
19 of developing and implementing each of the options.

20 (c) TRANSMITTAL.—Not later than 270 days after  
21 the date of enactment of this Act, the Administrator shall  
22 provide a report to the Committee on Science, Space, and  
23 Technology of the House of Representatives and the Com-  
24 mittee on Commerce, Science, and Transportation of the

1 Senate on the solicitation and review required under sub-  
2 section (b).

3 **SEC. 717. USE OF OPERATIONAL COMMERCIAL SUB-**  
4 **ORBITAL VEHICLES FOR RESEARCH, DEVEL-**  
5 **OPMENT, AND EDUCATION.**

6 (a) POLICY.—The Administrator shall develop a pol-  
7 icy on the use of operational commercial reusable sub-  
8 orbital flight vehicles for carrying out scientific and engi-  
9 neering investigations and educational activities.

10 (b) PLAN.—The Administrator shall prepare a plan  
11 on the Administration’s use of operational commercial re-  
12 usable suborbital flight vehicles for carrying out scientific  
13 and engineering investigations and educational activities.  
14 The plan shall—

15 (1) describe the purposes for which the Admin-  
16 istration intends to use such vehicles;

17 (2) describe the processes required to support  
18 such use, including the criteria used to determine  
19 which scientific and engineering investigations and  
20 educational activities are selected for a suborbital  
21 flight;

22 (3) describe Administration, space flight oper-  
23 ator, and supporting contractor responsibilities for  
24 developing standard payload interfaces and con-  
25 ducting payload safety analyses, payload integration

1 and processing, payload operations, and safety as-  
2 surance for Administration-sponsored space flight  
3 participants, among other functions required to fly  
4 Administration-sponsored payloads and space flight  
5 participants on operational commercial suborbital ve-  
6 hicles;

7 (4) identify Administration-provided hardware,  
8 software, or services that may be provided to com-  
9 mercial reusable suborbital space flight operators on  
10 a cost-reimbursable basis, through agreements or  
11 contracts entered into under section 20113(e) of  
12 title 51, United States Code; and

13 (5) describe the United States Government and  
14 space flight operator responsibilities for liability and  
15 indemnification with respect to commercial sub-  
16 orbital vehicle flights that involve Administration-  
17 sponsored payloads or activities, Administration-sup-  
18 ported space flight participants, or other Adminis-  
19 tration-related contributions.

20 (c) ASSESSMENT OF CAPABILITIES AND RISKS.—The  
21 Administrator shall assess and characterize the potential  
22 capabilities and performance of commercial reusable sub-  
23 orbital vehicles for addressing scientific research, includ-  
24 ing research requiring access to low-gravity and micro-  
25 gravity environments, for carrying out technology dem-

1 onstrations related to science, exploration, or space oper-  
2 ations requirements, and for providing opportunities for  
3 educating and training space scientists and engineers,  
4 once those vehicles become operational. The assessment  
5 shall also characterize the risks of using potential commer-  
6 cial reusable suborbital flights to Administration-spon-  
7 sored researchers and scientific investigations and flight  
8 hardware.

9       (d) TRANSMITTAL.—Not later than 1 year after the  
10 date of enactment of this Act, the Administrator shall  
11 transmit the plan and assessment described in subsections  
12 (b) and (c) to the Committee on Science, Space, and Tech-  
13 nology of the House of Representatives and the Committee  
14 on Commerce, Science, and Transportation of the Senate.

15       (e) ANNUAL PROGRESS REPORTS.—In conjunction  
16 with the Administration’s annual budget request justifica-  
17 tion for each fiscal year, the Administrator shall transmit  
18 a report to the Committee on Science, Space, and Tech-  
19 nology of the House of Representatives and the Committee  
20 on Commerce, Science, and Transportation of the Senate  
21 describing progress in carrying out the Commercial Reus-  
22 able Suborbital Research Program, including the number  
23 and type of suborbital missions planned in each fiscal  
24 year.

1 (f) INDEMNIFICATION AND LIABILITY.—The Admin-  
2 istrator shall not proceed with a request for proposals,  
3 award any contract, commit any United States Govern-  
4 ment funds, or enter into any other agreement for the pro-  
5 vision of a commercial reusable suborbital vehicle launch  
6 service for an Administration-sponsored spaceflight partic-  
7 ipant until transmittal of the plan and assessment speci-  
8 fied in subsections (b) and (c), the liability issues associ-  
9 ated with the use of such systems by the United States  
10 Government have been addressed, and the liability and in-  
11 demnification provisions that are planned to be included  
12 in such contracts or agreements have been provided to the  
13 Committee on Science, Space, and Technology of the  
14 House of Representatives and the Committee on Com-  
15 merce, Science, and Transportation of the Senate.

16 **SEC. 718. FUNDAMENTAL SPACE LIFE AND PHYSICAL**  
17 **SCIENCES RESEARCH.**

18 (a) SENSE OF CONGRESS.—It the sense of Congress  
19 that fundamental, discovery-based space life and physical  
20 sciences research is critical for enabling space exploration,  
21 protecting humans in space, and providing societal bene-  
22 fits, and that the space environment facilitates the ad-  
23 vancement of understanding of the life sciences and phys-  
24 ical sciences. Space life and physical science research con-  
25 tributes to advancing science, technology, engineering, and

1 mathematics research, and provides careers and training  
2 opportunities in academia, Federal laboratories, and com-  
3 mercial industry. Congress encourages the Administrator  
4 to augment discovery-based fundamental research and to  
5 establish requirements reflecting the importance of such  
6 research in keeping with the priorities established in the  
7 National Academies’ decadal survey entitled “Recapturing  
8 a Future for Space Exploration: Life and Physical  
9 Sciences Research for a New Era”.

10 (b) BUDGET REQUEST.—The Administrator shall in-  
11 clude as part of the Administration’s annual budget re-  
12 quest for each fiscal year a budget line for fundamental  
13 space life and physical sciences research, devoted to com-  
14 petitive, peer-reviewed grants, that is separate from the  
15 International Space Station Operations account.

16 (c) STRATEGIC PLAN.—

17 (1) DEVELOPMENT.—The Administrator, in  
18 consultation with academia, other Federal agencies,  
19 and other potential stakeholders, shall develop a  
20 strategic plan for carrying out competitive, peer-re-  
21 viewed fundamental space life science and physical  
22 sciences and related technology research, among  
23 other activities, consistent with the priorities in the  
24 National Academies’ decadal survey described in  
25 subsection (a).

1           (2) TRANSMITTAL.—Not later than 270 days  
2       after the date of enactment of this Act, the Adminis-  
3       trator shall transmit the strategic plan developed  
4       under paragraph (1) to the Committee on Science,  
5       Space, and Technology of the House of Representa-  
6       tives and the Committee on Commerce, Science, and  
7       Transportation of the Senate.

8   **SEC. 719. RESTORING COMMITMENT TO ENGINEERING RE-**  
9                           **SEARCH.**

10       (a) SENSE OF CONGRESS.—It is the sense of Con-  
11   gress that engineering excellence has long been a hallmark  
12   of the Administration’s ability to make significant ad-  
13   vances in aeronautics and space exploration. However, as  
14   has been noted in recent National Academies reports, in-  
15   creasingly constrained funding and competing priorities  
16   have led to an erosion of the Administration’s commitment  
17   to basic engineering research. This research provides the  
18   basis for the technology development that enables the Ad-  
19   ministration’s many challenging missions to succeed. If  
20   current trends continue, the Administration’s ability to at-  
21   tract and maintain the best and brightest engineering  
22   workforce at its Centers as well as its ability to remain  
23   on the cutting edge of aeronautical and space technology  
24   will continue to erode and will threaten the Administra-

1 tion's ability to be a world leader in aeronautics research  
2 and development and space exploration.

3 (b) PLAN.—The Administrator shall develop a plan  
4 for restoring a meaningful basic engineering research pro-  
5 gram at the Administration's Centers, including, as appro-  
6 priate, collaborations with industry, universities, and other  
7 relevant organizations. The plan shall identify the organi-  
8 zational approach to be followed, an initial set of basic  
9 research priorities, and a proposed budget.

10 (c) REPORT.—Not later than 180 days after the date  
11 of enactment of this Act, the Administrator shall transmit  
12 the plan specified in subsection (b) to the Committee on  
13 Science, Space, and Technology of the House of Rep-  
14 resentatives and the Committee on Commerce, Science,  
15 and Transportation of the Senate.

16 **SEC. 720. LIQUID ROCKET ENGINE DEVELOPMENT PRO-**  
17 **GRAM.**

18 The Administrator shall consult with the Secretary  
19 of Defense to ensure that any next generation liquid rock-  
20 et engine made in the United States for national security  
21 space launch objectives can contribute, to the extent prac-  
22 ticable, to the space programs and missions carried out  
23 by the Administration.



1 **SEC. 721. REMOTE SATELLITE SERVICING DEMONSTRATIONS.**  
2

3 (a) SENSE OF CONGRESS.—It is the sense of Con-  
4 gress that—

5 (1) the Administration plays a key role in dem-  
6 onstrating the feasibility of using robotic tech-  
7 nologies for a spacecraft that could autonomously  
8 access, inspect, repair, and refuel satellites;

9 (2) demonstrating this feasibility would both as-  
10 sist the Administration in its future missions and  
11 provide other Federal agencies and private sector en-  
12 tities with enhanced confidence in the feasibility to  
13 robotically refuel, inspect, repair, and maintain their  
14 satellites in both near and distant orbits; and

15 (3) the capability to refuel, inspect, repair, and  
16 maintain satellites robotically could add years of  
17 functional life to satellites.

18 (b) REPORT.—Not later than 120 days after the date  
19 of enactment of this Act, the Administrator shall transmit  
20 a report to the Committee on Science, Space, and Tech-  
21 nology of the House of Representatives and the Committee  
22 on Commerce, Science, and Transportation of the Senate  
23 describing the Administration's—

24 (1) activities, tools, and techniques associated  
25 with the ultimate goal of autonomously servicing sat-  
26 ellites using robotic spacecraft;

1           (2) efforts to coordinate its technology develop-  
2           ment and demonstrations with other Federal agen-  
3           cies and private sector entities that conduct pro-  
4           grams, projects, or activities on on-orbit satellite in-  
5           spection and servicing capabilities;

6           (3) efforts to leverage the work of these Federal  
7           agencies and private sector entities into the Admin-  
8           istration's plans;

9           (4) accomplishments to date in demonstrating  
10          various servicing technologies;

11          (5) major technical and operational challenges  
12          encountered and mitigation measures taken; and

13          (6) demonstrations needed to increase con-  
14          fidence in the use of the technologies for operational  
15          missions, and the timeframe for these demonstra-  
16          tions.

17 **SEC. 722. INFORMATION TECHNOLOGY GOVERNANCE.**

18          (a) SENSE OF CONGRESS.—It is the sense of Con-  
19          gress that information security is central to the Adminis-  
20          tration's ability to protect information and information  
21          systems vital to its mission.

22          (b) STUDY.—The Comptroller General of the United  
23          States shall conduct a study to assess the effectiveness of  
24          the Administration's Information Technology Governance.  
25          The study shall include an assessment of—

1           (1) the resources available for overseeing Ad-  
2           ministration-wide information technology operations,  
3           investments, and security measures and the Chief  
4           Information Officer’s visibility into and access to  
5           those resources;

6           (2) the effectiveness of the Administration’s de-  
7           centralized information technology structure, deci-  
8           sionmaking processes and authorities and its ability  
9           to enforce information security; and

10          (3) the impact of providing the Chief Informa-  
11          tion Officer approval authority over information  
12          technology investments that exceed a defined mone-  
13          tary threshold and any potential impacts of the  
14          Chief Information Officer having such authority on  
15          the Administration’s missions, flights programs and  
16          projects, research activities, and Center operations.

17          (c) REPORT.—Not later than 1 year after the date  
18          of enactment of this Act, the Comptroller General shall  
19          transmit a report detailing the results of the study con-  
20          ducted under subsection (b) to the Committee on Science,  
21          Space, and Technology of the House of Representatives  
22          and the Committee on Commerce, Science, and Transpor-  
23          tation of the Senate.

1 **SEC. 723. STRENGTHENING ADMINISTRATION SECURITY.**

2 (a) FINDINGS.—Congress makes the following find-  
3 ings:

4 (1) Following the public disclosure of security  
5 and export control violations at its research centers,  
6 the Administration contracted with the National  
7 Academy of Public Administration to conduct an  
8 independent assessment of how the Administration  
9 carried out Foreign National Access Management  
10 practices and other security matters.

11 (2) The assessment by the National Academy of  
12 Public Administration concluded that “NASA net-  
13 works are compromised”, that the Administration  
14 lacked a standardized and systematic approach to  
15 export compliance, and that individuals within the  
16 Administration were not held accountable when  
17 making serious, preventable errors in carrying out  
18 Foreign National Access Management practices and  
19 other security matters.

20 (b) REPORT.—Not later than 90 days after the date  
21 of enactment of this Act, the Administration shall report  
22 to the Committee on Science, Space, and Technology of  
23 the House of Representatives and the Committee on Com-  
24 merce, Science, and Transportation of the Senate on how  
25 it plans to address each of the recommendations made in  
26 the security assessment by the National Academy of Pub-

1 lie Administration and the recommendations made by the  
2 Government Accountability Office and the Administra-  
3 tion's Office of the Inspector General regarding security  
4 and safeguarding export control information.

5 (c) REVIEW.—Not later than 1 year after the date  
6 of enactment of this Act, the Comptroller General of the  
7 United States shall report to the Committee on Science,  
8 Space, and Technology of the House of Representatives  
9 and the Committee on Commerce, Science, and Transpor-  
10 tation of the Senate its assessment of how the Administra-  
11 tion has complied with the recommendations described in  
12 subsection (b).

13 **SEC. 724. PROHIBITION ON USE OF FUNDS FOR CONTRAC-**  
14 **TORS THAT HAVE COMMITTED FRAUD OR**  
15 **OTHER CRIMES.**

16 None of the funds authorized to be appropriated or  
17 otherwise made available for fiscal year 2016 or any fiscal  
18 year thereafter for the Administration may be used to  
19 enter into a contract with any offeror or any of its prin-  
20 cipals if the offeror certifies, pursuant to the Federal Ac-  
21 quisition Regulation, that the offeror or any of its prin-  
22 cipals—

23 (1) within a 3-year period preceding the offer  
24 has been convicted of or had a civil judgment ren-  
25 dered against it for—

1 (A) commission of fraud or a criminal of-  
2 fense in connection with obtaining, attempting  
3 to obtain, or performing a public (Federal,  
4 State, or local) contract or subcontract;

5 (B) violation of Federal or State antitrust  
6 statutes relating to the submission of offers; or

7 (C) commission of embezzlement, theft,  
8 forgery, bribery, falsification or destruction of  
9 records, making false statements, tax evasion,  
10 violating Federal criminal tax laws, or receiving  
11 stolen property;

12 (2) are presently indicted for, or otherwise  
13 criminally or civilly charged by a governmental enti-  
14 ty with, commission of any of the offenses enumer-  
15 ated in paragraph (1); or

16 (3) within a 3-year period preceding the offer,  
17 has been notified of any delinquent Federal taxes in  
18 an amount that exceeds \$3,000 for which the liabil-  
19 ity remains unsatisfied.

20 **SEC. 725. PROTECTION OF APOLLO LANDING SITES.**

21 (a) ASSESSMENT.—The Director of the Office of  
22 Science and Technology Policy, in consultation with all rel-  
23 evant agencies of the Federal Government and other ap-  
24 propriate entities and individuals, shall carry out a review  
25 and assessment of the issues involved in protecting and

1 preserving historically important Apollo Program lunar  
2 landing sites and Apollo program artifacts residing on the  
3 lunar surface, including those pertaining to Apollo 11 and  
4 Apollo 17. The review and assessment shall, at a min-  
5 imum, include determination of what risks to the protec-  
6 tion and preservation of those sites and artifacts exist or  
7 may exist in the future, what measures are required to  
8 ensure such protection and preservation, the extent to  
9 which additional domestic legislation or international trea-  
10 ties or agreements will be required, and specific rec-  
11 ommendations for protecting and preserving those lunar  
12 landing sites and artifacts.

13 (b) REPORT.—Not later than 1 year after the date  
14 of enactment of this Act, the Director shall transmit to  
15 the Committee on Science, Space, and Technology of the  
16 House of Representatives and the Committee on Com-  
17 merce, Science, and Transportation of the Senate the re-  
18 sults of the assessment required under subsection (a).

19 **SEC. 726. ASTRONAUT OCCUPATIONAL HEALTHCARE.**

20 (a) IN GENERAL.—The National Academies’ Insti-  
21 tute of Medicine report “Health Standards for Long Du-  
22 ration and Exploration Spaceflight: Ethics Principles, Re-  
23 sponsibilities, and Decision Framework” found that the  
24 Administration has ethical responsibilities for and should  
25 adopt policies and processes related to health standards

1 for long duration and exploration spaceflights that recog-  
2 nize those ethical responsibilities. In particular, the report  
3 recommended that the Administration “provide preventa-  
4 tive long-term health screening and surveillance of astro-  
5 nauts and lifetime health care to protect their health, sup-  
6 port ongoing evaluation of health standards, improve mis-  
7 sion safety, and reduce risks for current and future astro-  
8 nauts”.

9 (b) RESPONSE.—The Administration shall prepare a  
10 response to the National Academies report recommenda-  
11 tion described in subsection (a). The response shall include  
12 the estimated budgetary resources required for the imple-  
13 mentation of those recommendations, and any options that  
14 might be considered as part of the response.

15 (c) TRANSMITTAL.—The response required under  
16 subsection (b) shall be transmitted to the Committee on  
17 Science, Space, and Technology of the House of Rep-  
18 resentatives and the Committee on Commerce, Science,  
19 and Transportation of the Senate not later than 6 months  
20 after the date of enactment of this Act.

21 **SEC. 727. SENSE OF CONGRESS ON ACCESS TO OBSERVA-**  
22 **TIONAL DATA SETS.**

23 It is the sense of Congress that the Administration  
24 should prioritize the development of tools and interfaces  
25 that make publicly available observational data sets more



1 easy to access, analyze, manipulate, and understand for  
2 students, teachers, and the American public at large, with  
3 a particular focus on K–12 and undergraduate STEM  
4 education settings.

