

113TH CONGRESS
1ST SESSION

H. R. 2687

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

IN THE HOUSE OF REPRESENTATIVES

JULY 15, 2013

Mr. PALAZZO (for himself and Mr. SMITH of Texas) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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 of 2013”.

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 2014.
- Sec. 102. Fiscal year 2015.
- 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 capsule.
- Sec. 205. Advanced booster competition.

Subtitle B—Space Operations

- Sec. 211. Findings.
- Sec. 212. International Space Station.
- Sec. 213. Commercial crew report.
- Sec. 214. Flight readiness demonstration.
- Sec. 215. Certification Products Contract phase two.
- Sec. 216. Space communications.

TITLE III—SCIENCE

Subtitle A—General

- Sec. 301. Science portfolio.
- Sec. 302. Assessment of science mission extensions.
- Sec. 303. Radioisotope thermoelectric generators.
- Sec. 304. Congressional declaration of policy and purpose.

Subtitle B—Astrophysics

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

Subtitle C—Planetary Science

- Sec. 321. Decadal cadence.
- Sec. 322. Near-Earth objects.
- Sec. 323. Astrobiology strategy.
- Sec. 324. Public-private partnerships.

Subtitle D—Heliophysics

- Sec. 331. Decadal cadence.
- Sec. 332. Review of space weather.
- Sec. 333. Deep Space Climate Observatory.

Subtitle E—Earth Science

- Sec. 341. Goal.
- Sec. 342. Decadal cadence.
- Sec. 343. Research to operations.
- Sec. 344. Interagency coordination.

- Sec. 345. Joint Polar Satellite System climate sensors.
- Sec. 346. Land imaging.
- Sec. 347. Sources of Earth science data.

TITLE IV—AERONAUTICS

- Sec. 401. Sense of Congress.
- Sec. 402. Unmanned aerial systems research and development.
- Sec. 403. Research program on composite materials used in aeronautics.
- Sec. 404. Hypersonic research.
- Sec. 405. Supersonic research.
- Sec. 406. Research on NextGen airspace management concepts and tools.
- Sec. 407. Rotorcraft research.

TITLE V—SPACE TECHNOLOGY

- Sec. 501. Space technology.

TITLE VI—EDUCATION

- Sec. 601. Education.

TITLE VII—POLICY PROVISIONS

- Sec. 701. Asteroid Retrieval Mission.
- Sec. 702. Termination liability.
- Sec. 703. Indemnification extension.
- Sec. 704. Baseline and cost controls.
- Sec. 705. Project and program reserves.
- Sec. 706. Independent reviews.
- Sec. 707. Space Act Agreements.
- Sec. 708. Human spaceflight accident investigations.
- Sec. 709. Commercial technology transfer program.
- Sec. 710. Orbital debris.
- Sec. 711. NASA leadership.
- Sec. 712. NASA Advisory Council.
- Sec. 713. Cost estimation.

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.

1 (3) ORION CREW CAPSULE.—The term “Orion
2 crew capsule” refers to the multipurpose crew vehi-
3 cle described in section 303 of the National Aero-
4 nautics and Space Administration Authorization Act
5 of 2010 (42 U.S.C. 18323).

6 (4) SPACE ACT AGREEMENT.—The term “Space
7 Act Agreement” means an agreement created under
8 the authority to enter into “other transactions”
9 under section 20113(e) of title 51, United States
10 Code.

11 (5) SPACE LAUNCH SYSTEM.—The term “Space
12 Launch System” refers to the follow-on Government-
13 owned civil launch system developed, managed, and
14 operated by the Administration to serve as a key
15 component to expand human presence beyond low-
16 Earth orbit, as described in section 302 of the Na-
17 tional Aeronautics and Space Administration Au-
18 thorization Act of 2010 (42 U.S.C. 18322).

19 **TITLE I—AUTHORIZATION OF**
20 **APPROPRIATIONS**

21 **SEC. 101. FISCAL YEAR 2014.**

22 There are authorized to be appropriated to the Ad-
23 ministration for fiscal year 2014 \$16,865,200,000 as fol-
24 lows:

1 (1) For Space Exploration, \$4,007,400,000, of
2 which—

3 (A) \$1,802,400,000 shall be for the Space
4 Launch System;

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

7 (C) \$305,000,000 shall be for Exploration
8 Research and Development; and

9 (D) \$700,000,000 shall be for Commercial
10 Crew Development activities.

11 (2) For Space Operations, \$3,817,900,000, of
12 which—

13 (A) \$2,984,100,000 shall be for the Inter-
14 national Space Station Program; and

15 (B) \$833,800,000 shall be for Space and
16 Flight Support.

17 (3) For Science, \$4,626,900,000, of which—

18 (A) \$1,200,000,000 shall be for Earth
19 Science;

20 (B) \$1,500,000,000 shall be for Planetary
21 Science, of which \$30,000,000 shall be for the
22 Astrobiology Institute;

23 (C) \$642,300,000 shall be for Astro-
24 physics;

1 (D) \$658,200,000 shall be for the James
2 Webb Space Telescope; and

3 (E) \$626,400,000 shall be for
4 Heliophysics.

5 (4) For Aeronautics, \$565,700,000.

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

7 (6) For Education, \$125,000,000.

8 (7) For Cross-Agency Support, \$2,600,000,000,
9 of which—

10 (A) \$2,000,000,000 shall be for Center
11 Management and Operations; and

12 (B) \$600,000,000 shall be for Agency
13 Management and Operations.

14 (8) For Construction and Environmental Com-
15 pliance and Restoration, \$587,000,000, of which—

16 (A) \$542,000,000 shall be for Construction
17 and Facilities; and

18 (B) \$45,000,000 shall be for Environ-
19 mental Compliance and Restoration.

20 (9) For Inspector General, \$35,300,000.

21 **SEC. 102. FISCAL YEAR 2015.**

22 There are authorized to be appropriated to the Ad-
23 ministration for fiscal year 2015 \$16,865,200,000 as fol-
24 lows:

1 (1) For Space Exploration, \$4,007,400,000, of
2 which—

3 (A) \$1,802,400,000 shall be for the Space
4 Launch System;

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

7 (C) \$305,000,000 shall be for Exploration
8 Research and Development; and

9 (D) \$700,000,000 shall be for Commercial
10 Crew Development activities.

11 (2) For Space Operations, \$3,817,900,000, of
12 which—

13 (A) \$2,984,100,000 shall be for the Inter-
14 national Space Station Program; and

15 (B) \$833,800,000 shall be for Space and
16 Flight Support.

17 (3) For Science, \$4,626,900,000, of which—

18 (A) \$1,200,000,000 shall be for Earth
19 Science;

20 (B) \$1,500,000,000 shall be for Planetary
21 Science, of which \$30,000,000 shall be for the
22 Astrobiology Institute;

23 (C) \$642,300,000 shall be for Astro-
24 physics;

1 (D) \$658,200,000 shall be for the James
2 Webb Space Telescope; and

3 (E) \$626,400,000 shall be for
4 Heliophysics.

5 (4) For Aeronautics, \$565,700,000.

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

7 (6) For Education, \$125,000,000.

8 (7) For Cross-Agency Support, \$2,600,000,000,
9 of which—

10 (A) \$2,000,000,000 shall be for Center
11 Management and Operations; and

12 (B) \$600,000,000 shall be for Agency
13 Management and Operations.

14 (8) For Construction and Environmental Com-
15 pliance and Restoration, \$587,000,000, of which—

16 (A) \$542,000,000 shall be for Construction
17 and Facilities; and

18 (B) \$45,000,000 shall be for Environ-
19 mental Compliance and Restoration.

20 (9) For Inspector General, \$35,300,000.

21 **SEC. 103. BUDGET CONTROL.**

22 The amounts authorized to be appropriated to the
23 Administration for fiscal years 2014 and 2015 are con-
24 sistent with the Budget Control Act of 2011 (Public Law
25 112–25). If such Act is repealed or replaced with an Act

1 that increases allocations, there are authorized to be ap-
2 propriated to the Administration such sums as that in-
3 crease allows, with increases allocated as follows:

4 (1) One-third of such increase shall be for the
5 International Space Station Program.

6 (2) One-third of such increase shall be for the
7 Space Launch System.

8 (3) One-third of such increase shall be divided
9 evenly between—

10 (A) Commercial Crew Development activi-
11 ties; and

12 (B) the Orion crew capsule.

13 **TITLE II—HUMAN SPACE FLIGHT**

14 **Subtitle A—Exploration**

15 **SEC. 201. SPACE EXPLORATION POLICY.**

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

17 (1) Congress supports a human exploration pro-
18 gram that is not critically dependent on the achieve-
19 ment of milestones by fixed dates and an exploration
20 technology development program to enable lunar
21 human and robotic operations, as described in para-
22 graphs (1) and (2) of section 70502 of title 51,
23 United States Code.

24 (2) Congress supports the expansion of perma-
25 nent human presence beyond low-Earth orbit, in a

1 manner involving international partners where prac-
2 tical.

3 (3) Congress remains committed to ensuring
4 that authorized budgets for the human space flight
5 program should allow the Administration to main-
6 tain high safety standards.

7 (4) Exploration deeper into the solar system
8 should be the core mission of the Administration.

9 (5) Congress strongly supports the development
10 of the Space Launch System and the Orion crew
11 capsule as the enabling elements for human explo-
12 ration, advanced scientific missions, and national se-
13 curity priorities beyond low-Earth orbit.

14 (b) POLICY.—It is the policy of the United States
15 that the development of capabilities and technologies nec-
16 essary for human missions to lunar orbit, the surface of
17 the Moon, the surface of Mars, and beyond shall be the
18 goal of the Administration’s human space flight program.

19 (c) VISION FOR SPACE EXPLORATION.—Section
20 20302 of title 51, United States Code, is amended—

21 (1) by striking subsection (a) and inserting the
22 following:

23 “(a) IN GENERAL.—The Administrator shall estab-
24 lish a program to develop a sustained human presence on
25 the Moon and the surface of Mars, including a robust pre-

1 cursor program that follows the stepping stone plan re-
2 quired in section 70504 to promote exploration, science,
3 commerce, and United States preeminence in space. The
4 Administrator is further authorized to develop and con-
5 duct appropriate international collaborations in pursuit of
6 such program, but the absence of an international partner
7 may not be justification for failure to pursue such pro-
8 gram in a timely manner.”;

9 (2) in subsection (b)—

10 (A) by striking paragraph (1) and insert-
11 ing the following:

12 “(1) Returning Americans to the Moon.”;

13 (B) by striking paragraph (2) and insert-
14 ing the following:

15 “(2) Launching the first crewed mission of the
16 fully integrated Orion crew capsule with the Space
17 Launch System as close to 2020 as possible.”; and

18 (C) in paragraph (4), by striking “from
19 Mars and” and inserting “from the Moon,
20 Mars, and”; and

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

22 “(c) DEFINITIONS.—In this section:

23 “(1) ORION CREW CAPSULE.—The term ‘Orion
24 crew capsule’ refers to the multipurpose crew vehicle
25 described in section 303 of the National Aeronautics

1 and Space Administration Authorization Act of 2010
2 (42 U.S.C. 18323).

3 “(2) SPACE LAUNCH SYSTEM.—The term
4 ‘Space Launch System’ refers to the follow-on Gov-
5 ernment-owned civil launch system developed, man-
6 aged, and operated by the Administration to serve as
7 a key component to expand human presence beyond
8 low-Earth orbit, as described in section 302 of the
9 National Aeronautics and Space Administration Au-
10 thorization Act of 2010 (42 U.S.C. 18322).”.

11 (d) KEY OBJECTIVES.—Section 202(b) of the Na-
12 tional Aeronautics and Space Administration Authoriza-
13 tion Act of 2010 (42 U.S.C. 18312(b)) is amended—

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

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

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

19 “(5) to accelerate the development of capabili-
20 ties to enable a human exploration mission to the
21 surface of Mars and beyond through the
22 prioritization of those technologies and capabilities
23 best suited for such a mission in accordance with the
24 Mars Human Exploration Roadmap under section
25 70504 of title 51, United States Code.”.

1 (e) USE OF NON-UNITED STATES HUMAN SPACE
2 FLIGHT TRANSPORTATION CAPABILITIES.—Section
3 201(a) of the National Aeronautics and Space Administra-
4 tion Authorization Act of 2010 (42 U.S.C. 18311(a)) is
5 amended to read as follows:

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

8 “(1) IN GENERAL.—NASA may not obtain non-
9 United States human space flight capabilities unless
10 no domestic commercial provider is available to pro-
11 vide such capabilities.

12 “(2) DEFINITION.—For purposes of this sub-
13 section, the term ‘domestic commercial provider’
14 means a person providing space transportation serv-
15 ices or other space-related activities, the majority
16 control of which is held by persons other than a
17 Federal, State, local, or foreign government, foreign
18 company, or foreign national.”.

19 (f) REPEAL OF SPACE SHUTTLE CAPABILITY ASSUR-
20 ANCE.—Section 203 of the National Aeronautics and
21 Space Administration Authorization Act of 2010 (42
22 U.S.C. 18313) is amended—

23 (1) by striking subsection (b);

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

1 (3) by redesignating subsections (c) and (d) as
2 subsections (b) and (c), respectively.

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

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

6 **“§ 70504. Stepping stone approach to exploration**

7 “(a) IN GENERAL.—In order to maximize the cost
8 effectiveness of the long-term space exploration and utili-
9 zation activities of the United States, the Administrator
10 shall direct the Human Exploration and Operations Mis-
11 sion Directorate to develop a Mars Human Exploration
12 Roadmap to define the specific capabilities and tech-
13 nologies necessary to extend human presence to the sur-
14 face of Mars and the mission sets required to demonstrate
15 such capabilities and technologies.

16 “(b) ROADMAP REQUIREMENTS.—In developing the
17 Mars Human Exploration Roadmap, the Administrator
18 shall—

19 “(1) include the specific set of capabilities and
20 technologies required to extend human presence to
21 the surface of Mars and the mission sets necessary
22 to demonstrate the proficiency of these capabilities
23 and technologies with an emphasis on using the
24 International Space Station, lunar landings, cis-
25 lunar space, trans-lunar space, Lagrangian points,

1 and the natural satellites of Mars, Phobos and
2 Deimos, as testbeds, as necessary, and shall include
3 the most appropriate process for developing such ca-
4 pabilities and technologies;

5 “(2) provide a specific process for the evolution
6 of the capabilities of the fully integrated Orion crew
7 capsule with the Space Launch System and how
8 these systems demonstrate the capabilities and tech-
9 nologies described in paragraph (1);

10 “(3) provide a description of the capabilities
11 and technologies that could be demonstrated or re-
12 search data that could be gained through the utiliza-
13 tion of the International Space Station and the sta-
14 tus of the development of such capabilities and tech-
15 nologies;

16 “(4) describe a framework for international co-
17 operation in the development of all technologies and
18 capabilities required in this section, as well as an as-
19 sessment of the risks posed by relying on inter-
20 national partners for capabilities and technologies on
21 the critical path of development;

22 “(5) describe a process for utilizing nongovern-
23 mental entities for future human exploration beyond
24 trans-lunar space and specify what, if any, synergy
25 could be gained from—

1 “(A) partnerships using Space Act Agree-
2 ments (as defined in section 2 of the National
3 Aeronautics and Space Administration Author-
4 ization Act of 2013); or

5 “(B) other acquisition instruments; and

6 “(6) include in the Roadmap an addendum
7 from the NASA Advisory Council, and an addendum
8 from the Aerospace Safety Advisory Panel, each
9 with a statement of review of the Roadmap that
10 shall include—

11 “(A) subjects of agreement;

12 “(B) areas of concern; and

13 “(C) recommendations.

14 “(c) UPDATES.—The Administrator shall update
15 such Roadmap at least every 4 years and include it in the
16 budget for that fiscal year transmitted to Congress under
17 section 1105(a) of title 31, and describe—

18 “(1) the achievements and goals reached in the
19 process of developing such capabilities and tech-
20 nologies during the 4-year period prior to the sub-
21 mission of the Roadmap to Congress; and

22 “(2) the expected goals and achievements in the
23 following 4-year period.

1 “(d) DEFINITIONS.—The terms ‘Orion crew capsule’
2 and ‘Space Launch System’ have the meanings given such
3 terms in section 20302.”.

4 (b) REPORT.—

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

13 (2) UPDATES.—The Administrator shall trans-
14 mit a copy of each updated Mars Human Explo-
15 ration Roadmap to the Committee on Science,
16 Space, and Technology of the House of Representa-
17 tives and the Committee on Commerce, Science, and
18 Transportation of the Senate not later than 7 days
19 after such Roadmap is updated under section
20 70504(b)(6) of such title.

21 **SEC. 203. SPACE LAUNCH SYSTEM.**

22 (a) FINDINGS.—Congress finds that—

23 (1) the Space Launch System is the most prac-
24 tical approach to reaching the Moon, Mars, and be-
25 yond, and Congress reaffirms the policy and min-

1 imum capability requirements for the Space Launch
2 System contained in section 302 of the National
3 Aeronautics and Space Administration Authorization
4 Act of 2010 (42 U.S.C. 18322);

5 (2) the primary goal for the design of the fully
6 integrated Space Launch System is to safely carry
7 a total payload of 130 tons or more to low-Earth
8 orbit to enable human space exploration of the
9 Moon, Mars, and beyond over the course of the next
10 century as required in section 302(c) of the National
11 Aeronautics and Space Administration Authorization
12 Act of 2010 (42 U.S.C. 18322(c));

13 (3) the uncrewed flight test of the 70-ton core
14 element of the Space Launch System fully inte-
15 grated with the Orion crew capsule as described in
16 section 302(c)(1) of the National Aeronautics and
17 Space Administration Authorization Act of 2010 (42
18 U.S.C. 18322(c)(1)) is a necessary flight demonstra-
19 tion in an overall program plan, subject to appro-
20 priations; and

21 (4) the schedule of the 70-ton core element
22 crewed flight demonstration in 2021 with the Space
23 Launch System fully integrated with the Orion crew
24 capsule as described in section 302(c)(1) of the Na-
25 tional Aeronautics and Space Administration Au-

1 thorization Act of 2010 (42 U.S.C. 18322(c)(1)) is
2 subject to appropriations.

3 (b) IN GENERAL.—As required in section 302(c)(2)
4 of the National Aeronautics and Space Administration Au-
5 thorization Act of 2010 (42 U.S.C. 18322(c)(2)), the Ad-
6 ministration shall design the Space Launch System as a
7 fully integrated vehicle capable of carrying a total payload
8 of 130 tons or more into low-Earth orbit in preparation
9 for transit for missions beyond low-Earth orbit.

10 (c) PROGRESS REPORT.—

11 (1) IN GENERAL.—Using the President’s budg-
12 et request for fiscal year 2014 and notional numbers
13 requested therein as a baseline, not later than 90
14 days after the date of enactment of this Act the Ad-
15 ministrator shall transmit to the Committee on
16 Science, Space, and Technology of the House of
17 Representatives and the Committee on Commerce,
18 Science, and Transportation of the Senate an esti-
19 mate of—

20 (A) when the 70-ton core element of the
21 Space Launch System fully integrated with the
22 Orion crew capsule may be demonstrated as an
23 operational capability;

24 (B) when the 130-ton Space Launch Sys-
25 tem fully integrated with the Orion crew cap-

1 sule may be demonstrated as an operational ca-
2 pability;

3 (C) the projected annual operational costs
4 through 2030 for the 130-ton Space Launch
5 System fully integrated with the Orion crew
6 capsule after its operational capability has been
7 demonstrated; and

8 (D) the projected flight rate for the 130-
9 ton Space Launch System fully integrated with
10 the Orion crew capsule through 2030.

11 (2) CONTINGENCY FUNDING ESTIMATES.—If
12 the Administrator determines that the uncrewed test
13 flight of the 70-ton core element of the Space
14 Launch System fully integrated with the Orion crew
15 capsule will not occur on or before December 31,
16 2017, or that the crewed test flight of the 70-ton
17 core element of the Space Launch System fully inte-
18 grated with the Orion crew capsule will not occur on
19 or before December 31, 2021, the report transmitted
20 under paragraph (1) shall include an estimate of ad-
21 ditional funds required through annual appropria-
22 tions for fiscal years 2015 through 2021 which may
23 be necessary to meet such goals in those years.

24 (d) UTILIZATION REPORT.—The Administrator, in
25 consultation with the Secretary of Defense and the Direc-

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

18 **SEC. 204. ORION CREW CAPSULE.**

19 (a) IN GENERAL.—The Orion crew capsule shall meet
20 the practical needs and the minimum capability require-
21 ments described in section 303 of the National Aero-
22 nautics and Space Administration Authorization Act of
23 2010 (42 U.S.C. 18323).

24 (b) REPORT.—Not later than 60 days after the date
25 of enactment of this Act, the Administrator shall transmit

1 a report to the Committee on Science, Space, and Tech-
2 nology of the House of Representatives and the Committee
3 on Commerce, Science, and Transportation of the Sen-
4 ate—

5 (1) detailing those components and systems of
6 the Orion crew capsule that ensure it is in compli-
7 ance with section 303(b) of such Act (42 U.S.C.
8 18323(b));

9 (2) detailing the expected date that the Orion
10 crew capsule will be available to transport crew and
11 cargo to the International Space Station; and

12 (3) certifying that the requirements of section
13 303(b)(3) of such Act (42 U.S.C. 18323(b)(3)) will
14 be met by the Administration in time for the first
15 crewed test flight in 2021.

16 **SEC. 205. ADVANCED BOOSTER COMPETITION.**

17 (a) REPORT.—Not later than 90 days after the date
18 of enactment of this Act, the Associate Administrator of
19 the National Aeronautics and Space Administration shall
20 transmit 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 a report that—

1 (1) describes the estimated total development
2 cost of an advanced booster for the Space Launch
3 System; and

4 (2) details any reductions or increases to the
5 development cost of the Space Launch System which
6 may result from conducting a competition for an ad-
7 vanced booster.

8 (b) COMPETITION.—If the Associate Administrator
9 reports reductions pursuant to paragraph (2) of sub-
10 section (a), then the Administration shall conduct a full
11 and open competition for an advanced booster for the
12 Space Launch System to meet the requirements described
13 in section 302(c) of the National Aeronautics and Space
14 Administration Authorization Act of 2010 (42 U.S.C.
15 18322(c)), to begin not later than 1 year after the Asso-
16 ciate Administrator transmits the report required under
17 subsection (a).

18 **Subtitle B—Space Operations**

19 **SEC. 211. FINDINGS.**

20 Congress finds the following:

21 (1) The International Space Station is the ideal
22 short-term testbed for future exploration systems de-
23 velopment, including long-duration space travel.

24 (2) The use of the private market to provide
25 cargo and crew transportation services is currently

1 the most expeditious process to restore domestic ac-
2 cess to the International Space Station and low-
3 Earth orbit.

4 (3) Government-assured access to low-Earth
5 orbit is paramount to the continued success of the
6 International Space Station and National Labora-
7 tory.

8 (4) Acquiring and maintaining an operational
9 domestic commercial crew transportation service by
10 the year 2017 is of the utmost importance for the
11 future viability of the International Space Station
12 and National Laboratory.

13 **SEC. 212. INTERNATIONAL SPACE STATION.**

14 (a) IN GENERAL.—The following is the policy of the
15 United States:

16 (1) The International Space Station shall be
17 utilized to the maximum extent practicable for the
18 development of capabilities and technologies needed
19 for the future of human exploration beyond low-
20 Earth orbit.

21 (2) The Administrator shall, in consultation
22 with the International Space Station partners—

23 (A) take all necessary measures to support
24 the operation and full utilization of the Inter-
25 national Space Station; and

1 (B) seek to minimize, to the extent prac-
2 ticable, the operating costs of the International
3 Space Station.

4 (3) Reliance on foreign carriers for crew trans-
5 fer is unacceptable, and the Nation’s human space
6 flight program must acquire the capability to launch
7 United States astronauts on United States rockets
8 from United States soil as soon as is safe and prac-
9 tically possible, whether on Government-owned and
10 operated space transportation systems or privately
11 owned systems that have been certified for flight by
12 the appropriate Federal agencies.

13 (b) REAFFIRMATION OF POLICY.—Congress reaf-
14 firms—

15 (1) its commitment to the development of a
16 commercially developed launch and delivery system
17 to the International Space Station for crew missions
18 as expressed in the National Aeronautics and Space
19 Administration Authorization Act of 2005 (Public
20 Law 109–155), the National Aeronautics and Space
21 Administration Authorization Act of 2008 (Public
22 Law 110–422), and the National Aeronautics and
23 Space Administration Authorization Act of 2010
24 (Public Law 111–267);

1 (2) that the Administration shall make use of
2 United States commercially provided International
3 Space Station crew transfer and crew rescue services
4 to the maximum extent practicable; and

5 (3) the policy stated in section 501(b) of the
6 National Aeronautics and Space Administration Au-
7 thorization Act of 2010 (42 U.S.C. 18351(b)) that
8 the Administration shall pursue international, com-
9 mercial, and intragovernmental means to maximize
10 International Space Station logistics supply, mainte-
11 nance, and operational capabilities, reduce risks to
12 International Space Station systems sustainability,
13 and offset and minimize United States operations
14 costs relating to the International Space Station.

15 (c) ASSURED ACCESS TO LOW-EARTH ORBIT.—Sec-
16 tion 70501(a) of title 51, United States Code, is amended
17 to read as follows:

18 “(a) POLICY STATEMENT.—It is the policy of the
19 United States to maintain an uninterrupted capability for
20 human space flight and operations in low-Earth orbit, and
21 beyond, as an essential instrument of national security
22 and the capability to ensure continued United States par-
23 ticipation and leadership in the exploration and utilization
24 of space.”.

25 (d) REPEALS.—

1 (1) USE OF SPACE SHUTTLE OR ALTER-
2 NATIVES.—Chapter 701 of title 51, United States
3 Code, and the item relating to such chapter in the
4 table of chapters for such title, is repealed.

5 (2) SHUTTLE PRICING POLICY FOR COMMER-
6 CIAL AND FOREIGN USERS.—Chapter 703 of title
7 51, United States Code, and the item relating to
8 such chapter in the table of chapters for such title,
9 is repealed.

10 (3) SHUTTLE PRIVATIZATION.—Section 50133
11 of title 51, United States Code, and the item relat-
12 ing to such section in the table of sections for chap-
13 ter 501 of such title, is repealed.

14 (e) EXTENSION CRITERIA REPORT.—Not later than
15 1 year after the date of enactment of this Act, the Admin-
16 istrator shall submit to the Committee on Science, Space,
17 and Technology of the House of Representatives and the
18 Committee on Commerce, Science, and Transportation of
19 the Senate a report on the feasibility of extending the op-
20 eration of the International Space Station that includes—

21 (1) criteria for defining the International Space
22 Station as a research success;

23 (2) cost estimates for operating the Inter-
24 national Space Station to achieve the criteria in
25 paragraph (1);

1 (3) cost estimates for extending operations to
2 2020, 2025, and 2030; and

3 (4) an assessment of how the defined criteria
4 under paragraph (1) respond to the National Acad-
5 emies Decadal Survey on Biological and Physical
6 Sciences in Space.

7 (f) STRATEGIC PLAN FOR INTERNATIONAL SPACE
8 STATION RESEARCH.—

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

22 (2) PLAN REQUIREMENTS.—The strategic plan
23 shall—

24 (A) be consistent with the priorities and
25 recommendations established by the National

1 Academies in its Decadal Survey on Biological
2 and Physical Sciences in Space;

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

8 (C) identify—

9 (i) criteria for the proposed research,
10 including—

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

14 (II) the use of model systems;

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

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

1 (V) approaches for facilitating
2 data collection, analysis, and interpre-
3 tation;

4 (VI) procedures to ensure repeti-
5 tion of experiments, as needed;

6 (VII) support for timely presen-
7 tation of the peer-reviewed results of
8 the research; and

9 (VIII) defined metrics for the
10 success of each study;

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

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

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

1 free flyers, or other research platforms;
2 and
3 (v) defined metrics for success of the
4 research plan.

5 (3) REPORT.—

6 (A) IN GENERAL.—Not later than 1 year
7 after the date of enactment of this Act, the
8 Comptroller General of the United States shall
9 transmit to the Committee on Science, Space,
10 and Technology of the House of Representa-
11 tives and the Committee on Commerce, Science,
12 and Transportation of the Senate a report on
13 the progress of the organization chosen for the
14 management of the International Space Station
15 National Laboratory as directed in section 504
16 of the National Aeronautics and Space Admin-
17 istration Authorization Act of 2010 (42 U.S.C.
18 18354).

19 (B) SPECIFIC REQUIREMENTS.—The re-
20 port shall assess the management, organization,
21 and performance of such organization and shall
22 include a review of the status of each of the 7
23 required activities listed in section 504(c) of
24 such Act (42 U.S.C. 18354(c)).

1 **SEC. 213. COMMERCIAL CREW REPORT.**

2 (a) IN GENERAL.—The Administration shall consider
3 the ramifications of and create contingencies as the se-
4 questration adopted in the Budget Control Act of 2011
5 (Public Law 112–25) continues to reduce the Administra-
6 tion’s overall budget.

7 (b) REPORT.—

8 (1) IN GENERAL.—Not later than 60 days after
9 the date of enactment of this Act, the Administrator
10 shall transmit to the Committee on Science, Space,
11 and Technology of the House of Representatives and
12 the Committee on Commerce, Science, and Trans-
13 portation of the Senate a report containing 5 dis-
14 tinct options for the final stages of the commercial
15 crew program.

16 (2) REQUIREMENTS.—These options shall in-
17 clude—

18 (A) a strategy that assumes an appropria-
19 tion of \$500,000,000 over the next 3 fiscal
20 years;

21 (B) a strategy that assumes an appropria-
22 tion of \$600,000,000 over the next 3 fiscal
23 years;

24 (C) a strategy that assumes an appropria-
25 tion of \$700,000,000 over the next 3 fiscal
26 years;

1 (D) a strategy that assumes an appropria-
2 tion of \$800,000,000 over the next 3 fiscal
3 years; and

4 (E) a strategy that has yet to be consid-
5 ered previously in any budget submission but
6 that the Administration believes could ensure
7 the flight readiness date of 2017 for at least
8 one provider or significantly decreases the over-
9 all program lifecycle cost.

10 (3) INCLUSIONS.—Each strategy shall include
11 the contracting instruments the Administration will
12 employ to acquire the services in each phase of de-
13 velopment or acquisition, the number of commercial
14 providers the Administration will include in the pro-
15 gram, and the estimated flight readiness date in
16 each scenario.

17 **SEC. 214. FLIGHT READINESS DEMONSTRATION.**

18 (a) IN GENERAL.—The Administration shall carry
19 out its flight readiness demonstration, in which one or
20 more commercial crew partner companies safely trans-
21 ports United States astronauts to the International Space
22 Station, by December 31, 2017.

23 (b) REPORT.—Not later than 180 days after the date
24 of enactment of this Act and every 90 days thereafter until
25 the Administration carries out its flight readiness dem-

1 onstration, the Administrator shall transmit to the Com-
2 mittee on Science, Space, and Technology of the House
3 of Representatives and the Committee on Commerce,
4 Science, and Transportation of the Senate a report—

5 (1) describing the current status of the Com-
6 mercial Crew program, including all funding paid to
7 any partner company throughout the life of the pro-
8 gram detailed by specific dollar amounts provided
9 for each milestone completed for each partner com-
10 pany;

11 (2) specifying the accomplishments and mile-
12 stones completed in the 90 days prior to the date of
13 transmission of the report under any phase of the
14 program and all dollar amounts provided for each of
15 those milestones;

16 (3) identifying those accomplishments and mile-
17 stones that were expected to be completed in the 90
18 days prior to the date of transmission of such report
19 under any phase of the program but that were not
20 completed in that timeframe;

21 (4) setting forth the accomplishments and mile-
22 stones that are expected to be completed in the 90-
23 day period following the transmission of such report
24 under any phase of the program; and

1 (5) containing a statement of flight readiness
2 under subsection (c).

3 (c) STATEMENT OF FLIGHT READINESS.—The state-
4 ment of flight readiness required by subsection (b)(5) shall
5 include—

6 (1) either—

7 (A) a certification by the Administrator
8 that the Administration is on schedule to com-
9 ply with subsection (a); or

10 (B) an explanation as to why the Adminis-
11 tration is not on schedule to comply with sub-
12 section (a) and why the Administration did not
13 develop an acquisition strategy based on exist-
14 ing budget authority; and

15 (2) a certification by the Administrator that all
16 deviations from the Aerospace Safety Advisory Panel
17 recommendations have been reported in accordance
18 with section 215.

19 (d) AUTHORIZATION OF FUNDS.—Not later than 60
20 days after the issuance of the explanation described in
21 subsection (c)(2), the Administrator shall provide, and
22 begin implementation of, a new acquisition strategy that
23 ensures that at least 1 company will be prepared to pro-
24 vide crew transport services by December 31, 2017.

1 **SEC. 215. CERTIFICATION PRODUCTS CONTRACT PHASE**

2 **TWO.**

3 (a) **IN GENERAL.**—Phase two and any subsequent
4 phase of the Certification Products Contract, and any fur-
5 ther acquisition or development actions taken by the Ad-
6 ministration under the Commercial Crew Program, shall
7 be executed—

8 (1) under a cost-type contract specified by Fed-
9 eral Acquisition Regulations; and

10 (2) except as provided in subsection (b), in ac-
11 cordance with the 2012 Annual Report of the Aero-
12 space Safety Advisory Panel.

13 (b) **DEVIATIONS.**—

14 (1) **AUTHORITY.**—The Administrator may devi-
15 ate from any findings and recommendations of the
16 2012 Annual Report of the Aerospace Safety Advi-
17 sory Panel if the Administrator has determined
18 doing so is in the best interest of the program.

19 (2) **NOTICE AND JUSTIFICATION.**—If the Ad-
20 ministrator deviates from any findings and rec-
21 ommendations of the 2012 Annual Report of the
22 Aerospace Safety Advisory Panel under paragraph
23 (1), the Administrator shall transmit in writing to
24 the Chair of the Aerospace Safety Advisory Panel,
25 the Committee on Science, Space, and Technology of
26 the House of Representatives, and the Committee on

1 Commerce, Science, and Transportation of the Sen-
2 ate notice of any planned deviations, along with a
3 justification therefor, as part of the statement re-
4 quired under section 214(c)(1).

5 (c) REPORT.—The Aerospace Safety Advisory Panel
6 shall review and report to the Committee on Science,
7 Space, and Technology of the House of Representatives
8 and the Committee on Commerce, Science, and Transpor-
9 tation of the Senate on any deviation within 45 days of
10 notification.

11 **SEC. 216. SPACE COMMUNICATIONS.**

12 (a) PLAN.—The Administrator shall develop a plan,
13 in consultation with relevant Federal agencies, for updat-
14 ing the Administration’s space communications architec-
15 ture for both low-Earth orbital operations and deep space
16 exploration so that it is capable of meeting the Adminis-
17 tration’s needs over the next 20 years. The plan shall in-
18 clude lifecycle cost estimates, milestones, estimated per-
19 formance capabilities, and 5-year funding profiles. The
20 plan shall also include an estimate of the amounts of any
21 reimbursements the Administration is likely to receive
22 from other Federal agencies during the expected life of
23 the upgrades described in the plan. At a minimum, the
24 plan shall include a description of the following:

1 (1) Projected Deep Space Network require-
2 ments for the next 20 years, including those in sup-
3 port of human space exploration missions.

4 (2) Upgrades needed to support Deep Space
5 Network requirements, including cost estimates and
6 schedules.

7 (3) Cost estimates for the maintenance of exist-
8 ing Deep Space Network capabilities.

9 (4) Projected Tracking and Data Relay Sat-
10 ellite System requirements for the next 20 years, in-
11 cluding those in support of other relevant Federal
12 agencies.

13 (5) Cost and schedule estimates to maintain
14 and upgrade the Tracking and Data Relay Satellite
15 System to meet projected requirements.

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

18 (b) SCHEDULE.—The Administrator shall transmit
19 the plan developed under this section to the Committee
20 on Science, Space, and Technology of the House of Rep-
21 resentatives and the Committee on Commerce, Science,
22 and Transportation of the Senate not later than 1 year
23 after the date of enactment of this Act.

TITLE III—SCIENCE**Subtitle A—General****3 SEC. 301. SCIENCE PORTFOLIO.**

4 (a) BALANCED AND ADEQUATELY FUNDED ACTIVI-
5 TIES.—Section 803 of the National Aeronautics and Space
6 Administration Authorization Act of 2010 (124 Stat.
7 2832) is amended to read as follows:

8 **“SEC. 803. OVERALL SCIENCE PORTFOLIO; SENSE OF CON-
9 GRESS.**

10 “Congress reaffirms its sense, expressed in the Na-
11 tional Aeronautics and Space Administration Authoriza-
12 tion Act of 2010, that a balanced and adequately funded
13 set of activities, consisting of research and analysis grants
14 programs, technology development, small, medium, and
15 large space missions, and suborbital research activities,
16 contributes to a robust and productive science program
17 and serves as a catalyst for innovation and discovery.”.

18 (b) DECADAL SURVEYS.—In proposing the funding
19 of programs and activities for the National Aeronautics
20 and Space Administration for each fiscal year, the Admin-
21 istrator shall, to the greatest extent practicable, follow
22 guidance provided in the current decadal surveys from the
23 National Academies’ Space Studies Board.

1 **SEC. 302. ASSESSMENT OF SCIENCE MISSION EXTENSIONS.**

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

4 **“§ 30504. Assessment of science mission extensions**

5 “(a) ASSESSMENT.—The Administrator shall carry
6 out biennial reviews within each of the Science divisions
7 to assess the cost and benefits of extending the date of
8 the termination of data collection for those missions that
9 exceed their planned mission lifetime. The assessment
10 shall take into consideration how extending existing mis-
11 sions impacts the start of future missions.

12 “(b) CONSULTATION AND CONSIDERATION OF PO-
13 TENTIAL BENEFITS OF INSTRUMENTS ON MISSIONS.—
14 When deciding whether to extend a mission that has an
15 operational component, the Administrator shall consult
16 with any affected Federal agency and shall take into ac-
17 count the potential benefits of instruments on missions
18 that are beyond their planned mission lifetime.

19 “(c) COSTS.—If a mission is extended based on con-
20 sultation required under subsection (b), the full costs of
21 the extension shall be paid for by the operational agency
22 or agencies.

23 “(d) REPORT.—The Administrator shall transmit to
24 the Committee on Science, Space, and Technology of the
25 House of Representatives and the Committee on Com-
26 merce, Science, and Transportation of the Senate, at the

1 same time as the submission to Congress of the Presi-
2 dent's annual budget request, a report detailing any as-
3 sessment required by subsection (a) that was carried out
4 during the previous year.”.

5 **SEC. 303. RADIOISOTOPE THERMOELECTRIC GENERATORS.**

6 (a) ANALYSIS OF REQUIREMENTS AND RISKS.—The
7 Administrator, in consultation with other Federal agen-
8 cies, shall conduct an analysis of—

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

14 (2) the risks to missions of the Administration
15 in meeting those requirements, or any additional re-
16 quirements, due to a lack of adequate radioisotope
17 power system material.

18 (b) CONTENTS OF ANALYSIS.—The analysis con-
19 ducted under subsection (a) shall—

20 (1) detail the Administration's current pro-
21 jected mission requirements and associated time-
22 frames for radioisotope power system material;

23 (2) explain the assumptions used to determine
24 the Administration's requirements for the material,
25 including—

1 (A) the planned use of Advanced Stirling
2 Radioisotope Generator technology;

3 (B) the status of and timeline for com-
4 pleting development and demonstration of the
5 Advanced Stirling Radioisotope Generator tech-
6 nology, including the development of flight
7 readiness requirements; and

8 (C) the risks and implications of, and con-
9 tingencies for, any delays or unanticipated tech-
10 nical challenges affecting or related to the Ad-
11 ministration's mission plans for the anticipated
12 use of Advanced Stirling Radioisotope Gener-
13 ator technology;

14 (3) assess the risk to the Administration's pro-
15 grams of any potential delays in achieving the sched-
16 ule and milestones for planned domestic production
17 of radioisotope power system material;

18 (4) outline a process for meeting any additional
19 Administration requirements for the material;

20 (5) estimate the incremental costs required to
21 increase the amount of material produced each year,
22 if such an increase is needed to support additional
23 Administration requirements for the material;

24 (6) detail how the Administration and other
25 Federal agencies will manage, operate, and fund

1 production facilities and the design and development
2 of all radioisotope power systems used by the Ad-
3 ministration and other Federal agencies as nec-
4 essary;

5 (7) specify the steps the Administration will
6 take, in consultation with the Department of En-
7 ergy, to preserve the infrastructure and workforce
8 necessary for production of radioisotope power sys-
9 tems; and

10 (8) detail how the Administration has imple-
11 mented or rejected the recommendations from the
12 National Research Council's 2009 report titled "Ra-
13 dioisotope Power Systems: An Imperative for Main-
14 taining U.S. Leadership in Space Exploration".

15 (c) TRANSMITTAL.—Not later than 180 days after
16 the date of enactment of this Act, the Administrator shall
17 transmit the results of the analysis to the Committee on
18 Science, Space, and Technology of the House of Rep-
19 resentatives and the Committee on Commerce, Science,
20 and Transportation of the Senate.

21 **SEC. 304. CONGRESSIONAL DECLARATION OF POLICY AND**
22 **PURPOSE.**

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

1 “(10) The direction of the unique competence
2 of the Administration to the search for life’s origin,
3 evolution, distribution, and future in the Universe.
4 In carrying out this objective, the Administration
5 may use any practicable ground-based, airborne, or
6 space-based technical means and spectra of electro-
7 magnetic radiation.”.

8 **Subtitle B—Astrophysics**

9 **SEC. 311. DECADAL CADENCE.**

10 In carrying out section 301(b), the Administrator
11 shall ensure a steady cadence of large, medium, and small
12 astrophysics missions.

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

14 (a) STRATEGY.—The Administrator shall enter into
15 an arrangement with the National Academies to develop
16 a science strategy for the study and exploration of
17 extrasolar planets, including the use of TESS, the James
18 Webb Space Telescope, WFIRST, or any other telescope,
19 spacecraft, or instrument as appropriate. Such strategy
20 shall—

- 21 (1) outline key scientific questions;
- 22 (2) identify the most promising research in the
23 field;

1 (3) indicate the extent to which the mission pri-
2 orities in existing decadal surveys address key
3 extrasolar planet research goals; and

4 (4) make recommendations with respect to opti-
5 mal coordination with international partners.

6 (b) USE OF STRATEGY.—The Administrator shall use
7 the strategy to—

8 (1) inform roadmaps, strategic plans, and other
9 activities of the Administration as they relate to
10 extrasolar planet research and exploration; and

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

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

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

21 It is the sense of Congress that the James Webb
22 Space Telescope program is significant to our under-
23 standing of the history of the universe, including galaxies,
24 stars, and planetary systems, and should continue to re-
25 ceive priority of funding in accord with the recommenda-

1 tion of the most recent decadal survey for Astronomy and
2 Astrophysics of the National Academies' Space Studies
3 Board.

4 **SEC. 314. WIDE-FIELD INFRARED SURVEY TELESCOPE.**

5 The Administrator shall ensure that the development
6 of the Wide-Field Infrared Survey Telescope continues
7 while the James Webb Space Telescope is completed.

8 **SEC. 315. NATIONAL RECONNAISSANCE OFFICE TELESCOPE**
9 **DONATION.**

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

24 (1) an assessment of affordable approaches to
25 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 **Subtitle C—Planetary Science**

11 **SEC. 321. DECADAL CADENCE.**

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

18 (1) a Discovery-class mission at least once every
19 24 months;

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

22 (3) at least one Flagship-class mission per
23 decadal survey period, starting with a Europa mis-
24 sion 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, nearly 65,000,000
9 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 taken to date by the Adminis-
20 tration for detecting and characterizing the hazards
21 of near-Earth objects must continue to fully deter-
22 mine the threat posed by such objects to cause wide-
23 spread 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 discover, track, catalogue, and
5 characterize the physical characteristics of near-Earth ob-
6 jects equal to or greater than 140 meters in diameter in
7 order to assess the threat of such near-Earth objects to
8 the Earth, pursuant to the George E. Brown, Jr. Near-
9 Earth Object Survey Act (42 U.S.C. 16691). It shall be
10 the goal of the Survey program to achieve 90 percent com-
11 pletion of its near-Earth object catalogue (based on statis-
12 tically predicted populations of near-Earth objects) by
13 2020.

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

19 (e) PROGRAM REPORT.—The Administrator shall
20 transmit 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 not later than 1 year after the date of enactment of this
24 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.—The Administrator shall an-
13 nually transmit to the Committee on Science, Space, and
14 Technology of the House of Representatives and the Com-
15 mittee on Commerce, Science, and Transportation of the
16 Senate a report that provides—

17 (1) a summary of all activities carried out pur-
18 suant to subsection (c) since the date of enactment
19 of this Act; and

20 (2) a summary of expenditures for all activities
21 carried out pursuant to subsection (c) since the date
22 of enactment of this Act.

23 **SEC. 323. ASTROBIOLOGY STRATEGY.**

24 (a) STRATEGY.—The Administrator shall enter into
25 an arrangement with the National Academies to develop

1 a science strategy for astrobiology that would outline key
2 scientific questions, identify the most promising research
3 in the field, and indicate the extent to which the mission
4 priorities in existing decadal surveys address the search
5 for life's origin, evolution, distribution, and future in the
6 Universe.

7 (b) USE OF STRATEGY.—The Administrator shall use
8 the strategy developed under subsection (a) in planning
9 and funding research and other activities and initiatives
10 in the field of astrobiology. The strategy shall include rec-
11 ommendations for coordination with international part-
12 ners.

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

20 **SEC. 324. PUBLIC-PRIVATE PARTNERSHIPS.**

21 Not later than 180 days after the date of enactment
22 of this Act, the Administrator shall transmit to the Com-
23 mittee on Science, Space, and Technology of the House
24 of Representatives and the Committee on Commerce,
25 Science, and Transportation of the Senate a report de-

1 scribing how the Administration can expand collaborative
2 public-private partnerships to study life’s origin, evolution,
3 distribution, and future in the Universe.

4 **Subtitle D—Heliophysics**

5 **SEC. 331. DECADAL CADENCE.**

6 In carrying out section 301(b), the Administrator
7 shall ensure a steady cadence of large, medium, and small
8 heliophysics missions.

9 **SEC. 332. REVIEW OF SPACE WEATHER.**

10 (a) REVIEW.—The Director of the Office of Science
11 and Technology Policy, in consultation with the Adminis-
12 trator, the Administrator of the National Oceanic and At-
13 mospheric Administration, the Director of the National
14 Science Foundation, the Secretary of Defense, the Sec-
15 retary of Energy, and the Secretary of Homeland Secu-
16 rity, shall enter into an arrangement with the National
17 Academies to provide a comprehensive study that reviews
18 current and planned space weather monitoring require-
19 ments and capabilities. The study shall inform the process
20 of identifying national needs for future space weather
21 monitoring and mitigation. The National Academies shall
22 give consideration to international and private sector ef-
23 forts and collaboration. The study shall also review the
24 current state of research capabilities in observing, mod-

1 eling, and prediction and provide recommendations to en-
2 sure future advancement of predictive capability.

3 (b) REPORT TO CONGRESS.—Not later than 1 year
4 after the date of enactment of this Act, the National Acad-
5 emies shall transmit a report to the Administrator, and
6 to the Committee on Science, Space, and Technology of
7 the House of Representatives and the Committee on Com-
8 merce, Science, and Transportation of the Senate, con-
9 taining the results of the study provided under subsection
10 (a).

11 **SEC. 333. DEEP SPACE CLIMATE OBSERVATORY.**

12 (a) INTEGRATING SENSORS.—The Administrator
13 may not integrate or fund the development of any sensor
14 on the Deep Space Climate Observatory (DSCOVR) that
15 is not aligned with the spacecraft’s original space weather
16 mission requirements.

17 (b) ALGORITHMS.—The Administration may not de-
18 velop or implement algorithms, or any other applications
19 or products, that—

20 (1) are not aligned with the Deep Space Cli-
21 mate Observatory mission’s intended space weather
22 requirements; or

23 (2) enable “Earth at noon” images from the
24 spacecraft.

1 **Subtitle E—Earth Science**

2 **SEC. 341. GOAL.**

3 (a) **IN GENERAL.**—Recognizing the contributions
4 that Earth science and remote sensing have made to soci-
5 ety over the last 50 years, the Administration shall con-
6 tinue to develop first-of-a-kind instruments that, once
7 proved, can be transitioned to other agencies for oper-
8 ations.

9 (b) **AMENDMENT.**—Section 60501 of title 51, United
10 States Code, is amended by inserting “In order to accom-
11 plish this goal, the Administrator shall conduct research
12 and development on new sensors and instruments that will
13 mitigate the risks associated with the development of oper-
14 ational systems and long-term data continuity require-
15 ments by other agencies. The Administration shall not be
16 responsible for the development of operational Earth
17 science systems, including satellite, sensor, or instrument
18 development, acquisition, and operations, as well as prod-
19 uct development and data analysis, unless such work is
20 conducted on a reimbursable basis that accounts for the
21 full cost of the work. The Administrator shall use the
22 Joint Agency Satellite Division structure, or a direct suc-
23 cessor thereto, to manage this process on a fully reimburs-
24 able basis.” after “Earth observations-based research pro-
25 gram.”.

1 **SEC. 342. DECADAL CADENCE.**

2 In carrying out section 301(b), the Administrator
3 shall ensure a steady cadence of large, medium, and small
4 Earth science missions.

5 **SEC. 343. RESEARCH TO OPERATIONS.**

6 Section 60502(a) of title 51, United States Code, is
7 amended by inserting “Operational responsibility for
8 Earth science or space weather missions or sensors may
9 not be transferred from any other Federal agency to the
10 Administration, except as specifically authorized by law.”
11 after “execute the transitions.”.

12 **SEC. 344. INTERAGENCY COORDINATION.**

13 Section 60505 of title 51, United States Code, is
14 amended—

15 (1) in the section heading, by inserting “**and**
16 **other Federal agencies**” after “**Atmos-**
17 **pheric Administration**”;

18 (2) in subsection (a)—

19 (A) by striking “and the Administrator of
20 the National Oceanic and Atmospheric Admin-
21 istration” and inserting “, the Administrator of
22 the National Oceanic and Atmospheric Admin-
23 istration, and the heads of other relevant Fed-
24 eral agencies”; and

25 (B) by striking “the two agencies” and in-
26 serting “each of those agencies”;

1 (3) in subsection (b)—

2 (A) by striking “and the Administrator of
3 the National Oceanic and Atmospheric Admin-
4 istration” and inserting “, the Administrator of
5 the National Oceanic and Atmospheric Admin-
6 istration, and the heads of other relevant Fed-
7 eral agencies”;

8 (B) by striking “Committee on Science and
9 Technology” and inserting “Committee on
10 Science, Space, and Technology”; and

11 (C) by striking “and the National Oceanic
12 and Atmospheric Administration” and inserting
13 “, the National Oceanic and Atmospheric Ad-
14 ministration, and other relevant Federal agen-
15 cies”; and

16 (4) in subsection (d), by striking “Administra-
17 tion Earth science mission” and all that follows
18 through the period and inserting “Earth science
19 mission or Earth observing system to or from the
20 National Oceanic and Atmospheric Administration,
21 any other Federal agency, or the Administration, or
22 to or from other stakeholders, until the plans re-
23 quired under subsection (c) have been approved by
24 the Administrator, the Administrator of the National
25 Oceanic and Atmospheric Administration, and the

1 heads of other relevant Federal agencies, and until
2 financial resources have been identified to support
3 the transition or transfer in the President’s annual
4 budget request for the National Oceanic and Atmos-
5 pheric Administration, the Administration, or other
6 relevant agencies. Operational responsibility for
7 Earth science programs may not be transferred from
8 any other Federal agency to the Administration, ex-
9 cept as specifically authorized by law.”.

10 **SEC. 345. JOINT POLAR SATELLITE SYSTEM CLIMATE SEN-**
11 **SORS.**

12 The Administration shall not be responsible for the
13 development of Joint Polar Satellite System climate sen-
14 sors, including the Total Solar Irradiance Sensor (TSIS–
15 2), the Ozone Mapping and Profiler Suite–Limb (OMPS–
16 L), or the Clouds and Earth Radiant Energy System
17 (CERES–C). Any effort by the Administration related to
18 this work shall be conducted on a fully reimbursable basis
19 and executed by the Administration’s Joint Agency Sat-
20 ellite Division or a direct successor thereto.

21 **SEC. 346. LAND IMAGING.**

22 (a) REAFFIRMATION OF POLICY.—Congress reaf-
23 firms the finding in section 2(1) of the Land Remote Sens-
24 ing Policy Act of 1992 (15 U.S.C. 5601(1)), which states
25 that “The continuous collection and utilization of land re-

1 mote sensing data from space are of major benefit in
2 studying and understanding human impacts on the global
3 environment, in managing the Earth's natural resources,
4 in carrying out national security functions, and in plan-
5 ning and conducting many other activities of scientific,
6 economic, and social importance.”.

7 (b) CONTINUOUS LAND REMOTE SENSING DATA
8 COLLECTION.—The Director of the Office of Science and
9 Technology Policy shall take steps in consultation with
10 other relevant Federal agencies to ensure, to the maximum
11 extent practicable, the continuous collection of space-
12 based, medium-resolution observations of the Earth's land
13 cover, and to ensure that the data are made available in
14 such ways as to facilitate the widest possible use.

15 (c) DEFINITION OF LAND IMAGING CAPABILITIES.—
16 The Administrator may not initiate the definition of re-
17 quirements for land imaging capabilities unless such work
18 is conducted on a fully reimbursable basis and executed
19 by the Administration's Joint Agency Satellite Division or
20 a direct successor thereto.

21 **SEC. 347. SOURCES OF EARTH SCIENCE DATA.**

22 (a) ACQUISITION.—The Administrator shall, to the
23 extent possible and while satisfying the scientific or edu-
24 cational requirements of the Administration and, where
25 appropriate, of other Federal agencies and scientific re-

1 searchers, acquire, where cost effective, space-based and
2 airborne Earth remote sensing data, services, distribution,
3 and applications from non-Federal providers.

4 (b) TREATMENT AS COMMERCIAL ITEM UNDER AC-
5 QUISSION LAWS.—Acquisitions by the Administrator of
6 the data, services, distribution, and applications referred
7 to in subsection (a) shall be carried out in accordance with
8 applicable acquisition laws and regulations (including
9 chapters 137 and 140 of title 10, United States Code).
10 For purposes of such laws and regulations, such data,
11 services, distribution, and applications shall be considered
12 to be commercial items. Nothing in this subsection shall
13 be construed to preclude the United States from acquiring,
14 through contracts with commercial providers, sufficient
15 rights in data to meet the needs of the scientific and edu-
16 cational community or the needs of other government ac-
17 tivities.

18 (c) SAFETY STANDARDS.—Nothing in this section
19 shall be construed to prohibit the Federal Government
20 from requiring compliance with applicable safety stand-
21 ards.

22 (d) REPORT.—Not later than 180 days after the date
23 of enactment of the Act, the Administrator shall submit
24 a report to the Committee on Science, Space, and Tech-
25 nology of the House of Representatives and the Committee

1 on Commerce, Science, and Transportation of the Senate
2 on the Administration's efforts to carry out this section.

3 **TITLE IV—AERONAUTICS**

4 **SEC. 401. SENSE OF CONGRESS.**

5 It is the sense of Congress that—

6 (1) a robust aeronautics research portfolio will
7 help maintain the United States status as a leader
8 in aviation;

9 (2) aeronautics research is essential to the Ad-
10 ministration's mission; and

11 (3) the Administrator should coordinate and
12 consult with relevant Federal agencies and the pri-
13 vate sector to minimize duplication and leverage re-
14 sources.

15 **SEC. 402. UNMANNED AERIAL SYSTEMS RESEARCH AND DE-** 16 **VELOPMENT.**

17 (a) IN GENERAL.—The Administrator, in consulta-
18 tion with the Administrator of the Federal Aviation Ad-
19 ministration and other Federal agencies, shall direct re-
20 search and technological development to facilitate the safe
21 integration of unmanned aerial systems into the National
22 Airspace System, including—

23 (1) positioning and navigation systems;

24 (2) sense and avoid capabilities;

25 (3) secure data and communication links;

1 (4) flight recovery systems; and

2 (5) human systems integration.

3 (b) ROADMAP.—The Administrator shall update a
4 roadmap for unmanned aerial systems research and devel-
5 opment and transmit this roadmap to the Committee on
6 Science, Space, and Technology of the House of Rep-
7 resentatives and the Committee on Commerce, Science,
8 and Transportation of the Senate not later than 90 days
9 after the date of enactment of this Act.

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

17 **SEC. 403. RESEARCH PROGRAM ON COMPOSITE MATERIALS**
18 **USED IN AERONAUTICS.**

19 (a) CONSULTATION.—The Administrator, in over-
20 seeing the Administration’s Integrated Systems Research
21 Program’s work on composite materials, shall consult with
22 relevant Federal agencies and partners in industry to ac-
23 celerate safe development and certification processes for
24 new composite materials and design methods while main-
25 taining rigorous inspection of new composite materials.

1 (b) REPORT.—Not later than 1 year after the date
2 of enactment of this Act, the Administrator shall transmit
3 a report to the Committee on Science, Space, and Tech-
4 nology of the House of Representatives and the Committee
5 on Commerce, Science, and Transportation of the Senate
6 detailing the Administration’s work on new composite ma-
7 terials and the coordination efforts among Federal agen-
8 cies.

9 **SEC. 404. HYPERSONIC RESEARCH.**

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

1 **SEC. 405. SUPERSONIC RESEARCH.**

2 Not later than 1 year after the date of enactment
3 of this Act, the Administrator shall develop and transmit
4 to the Committee on Science, Space, and Technology of
5 the House of Representatives and the Committee on Com-
6 merce, Science, and Transportation of the Senate a road-
7 map that allows for flexible funding profiles, for super-
8 sonic aeronautics research and development with the ob-
9 jective of developing and demonstrating, in a relevant envi-
10 ronment, airframe and propulsion technologies to mini-
11 mize the environmental impact, including noise, of super-
12 sonic overland flight in an efficient and economical man-
13 ner. The roadmap shall include—

14 (1) a status report on the Administration’s ex-
15 isting research on supersonic flight;

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

20 (3) a research plan to address such challenges,
21 as well as a project timeline for accomplishing rel-
22 evant research goals; and

23 (4) a plan for coordination with stakeholders,
24 including relevant government agencies and indus-
25 try.

1 **SEC. 406. RESEARCH ON NEXTGEN AIRSPACE MANAGE-**
2 **MENT CONCEPTS AND TOOLS.**

3 (a) IN GENERAL.—The Administrator shall, in con-
4 sultation with the Director of the Joint Planning and De-
5 velopment Office of the Federal Aviation Administration,
6 review at least annually the alignment and timing of the
7 Administration’s research and development activities in
8 support of the NextGen airspace management moderniza-
9 tion initiative, and shall make any necessary adjustments
10 by reprioritizing or retargeting the Administration’s re-
11 search and development activities in support of the
12 NextGen initiative.

13 (b) ANNUAL REPORTS.—The Administrator shall re-
14 port to the Committee on Science, Space, and Technology
15 of the House of Representatives and the Committee on
16 Commerce, Science, and Transportation of the Senate an-
17 nually regarding the progress of the Administration’s re-
18 search and development activities in support of the
19 NextGen airspace management modernization initiative,
20 including details of consultation with the Federal Aviation
21 Administration and any adjustments made to research ac-
22 tivities.

23 **SEC. 407. ROTORCRAFT RESEARCH.**

24 Not later than 1 year after the date of enactment
25 of this Act, the Administrator, in consultation with other
26 Federal agencies, shall prepare and transmit 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 a plan for re-
4 search relating to rotorcraft and other runway-inde-
5 pendent air vehicles, with the objective of developing and
6 demonstrating improved safety, noise, and environmental
7 impact in a relevant environment. The plan shall include
8 specific goals for the research, a timeline for implementa-
9 tion, metrics for success, and guidelines for collaboration
10 and coordination with industry and other Federal agen-
11 cies.

12 **TITLE V—SPACE TECHNOLOGY**

13 **SEC. 501. SPACE TECHNOLOGY.**

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

15 (1) The Space Technology Mission Directorate
16 created by the Administration is lacking an organic
17 statutory authorization and in need of congressional
18 direction.

19 (2) In order to appropriately prioritize the Ad-
20 ministration's resources to accomplish its goals and
21 purposes, the Space Technology Mission Directorate
22 needs to be reorganized as provided in the amend-
23 ments made by this section.

24 (3) Projects, programs, and activities currently
25 within the Exploration Research and Development

1 program should continue as planned as part of the
2 Human Exploration and Operations Mission Direc-
3 torate.

4 (b) SPACE TECHNOLOGY PROGRAM.—

5 (1) AMENDMENT.—Section 70507 of title 51,
6 United States Code, is amended to read as follows:

7 **“§ 70507. Space Technology Program authorized**

8 “(a) PROGRAM AUTHORIZED.—The Administrator
9 shall establish, within the office of the Administrator, a
10 Space Technology Program to pursue the development of
11 technologies that enable exploration of the solar system
12 or advanced space science throughout the various elements
13 of the Administration.

14 “(b) SMALL BUSINESS PROGRAMS.—The Adminis-
15 trator shall organize and manage the Administration’s
16 Small Business Innovation Research program and Small
17 Business Technology Transfer program within the Space
18 Technology Program.

19 “(c) NONDUPLICATION CERTIFICATION.—The Ad-
20 ministrator shall include in the budget for each fiscal year,
21 as transmitted to Congress under section 1105(a) of title
22 31, a certification that no project, program, or mission
23 undertaken by the Space Technology Program is inde-
24 pendently under development by any other office or direc-
25 torate of the Administration.”.

1 (2) TABLE OF SECTIONS AMENDMENT.—The
2 item relating to section 70507 in the table of sec-
3 tions for chapter 705 of title 51, United States
4 Code, is amended to read as follows:

“70507. Space Technology Program authorized.”.

5 **TITLE VI—EDUCATION**

6 **SEC. 601. EDUCATION.**

7 (a) IN GENERAL.—The Administration shall continue
8 its education and outreach efforts to—

9 (1) increase student interest and participation
10 in Science, Technology, Engineering, and Mathe-
11 matics (“STEM”) education;

12 (2) improve public literacy in STEM;

13 (3) employ proven strategies for improving stu-
14 dent learning and teaching;

15 (4) provide curriculum support materials; and

16 (5) create and support opportunities for profes-
17 sional development for STEM teachers.

18 (b) ORGANIZATION.—In order to ensure the inspira-
19 tion and engagement of children and the general public,
20 the Administration shall continue its STEM education and
21 outreach activities within the Science, Aeronautics Re-
22 search, Space Operations, and Exploration Mission Direc-
23 torates. Funds devoted to education and public outreach
24 shall be maintained in the Directorates, and the consolida-

1 tion of these activities into the Education Directorate is
2 prohibited.

3 (c) PROHIBITION.—The Administration may not im-
4 plement any proposed STEM education and outreach-re-
5 lated changes proposed in the budget for fiscal year 2014
6 transmitted to Congress under section 1105(a) of title 31,
7 United States Code.

8 **TITLE VII—POLICY PROVISIONS**

9 **SEC. 701. ASTEROID RETRIEVAL MISSION.**

10 (a) IN GENERAL.—Consistent with the policy stated
11 in section 201(b), the Administrator may not fund the de-
12 velopment of an asteroid retrieval mission to send a
13 robotic spacecraft to a near-Earth asteroid for rendezvous,
14 retrieval, and redirection of that asteroid to lunar orbit
15 for exploration by astronauts.

16 (b) ASTEROID SURVEY.—The Administration may
17 not pursue a program to search for asteroids of 20 meters
18 or less in diameter unless the survey program described
19 in section 322(c) is at least 90 percent complete.

20 (c) REPORT.—Not later than 180 days after the date
21 of enactment of this Act, the Administrator shall provide
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 a report

1 on the proposed Asteroid Retrieval Mission. Such report
2 shall include—

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

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

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

13 (4) a complete review by the Small Bodies As-
14 sessment Group and the NASA Advisory Council
15 that includes a recommendation to Congress on the
16 feasibility of the mission as proposed by the Admin-
17 istration.

18 **SEC. 702. TERMINATION LIABILITY.**

19 (a) FINDINGS.—Congress makes the following find-
20 ings:

21 (1) The International Space Station, the Space
22 Launch System, and the Orion crew capsule will en-
23 able the Nation to continue operations in low-Earth
24 orbit and to send its astronauts to deep space. As
25 a result of their unique capabilities and their critical

1 contribution to the future of space exploration, these
2 systems have been designated by Congress and the
3 Administration as priority investments.

4 (2) While the Space Launch System and the
5 Orion programs, currently under development, have
6 made significant progress, they have not been fund-
7 ed at levels authorized, and as a result congression-
8 ally authorized milestones will be delayed by several
9 years.

10 (3) In addition, contractors are currently hold-
11 ing program funding, estimated to be in the hun-
12 dreds of millions of dollars, to cover the potential
13 termination liability should the Government choose
14 to terminate a program for convenience. As a result,
15 hundreds of millions of taxpayer dollars are unavail-
16 able for meaningful work on these programs.

17 (4) According to the Government Accountability
18 Office, the Administration procures most of its
19 goods and services through contracts, and it termi-
20 nates very few of them. In fiscal year 2010, the Ad-
21 ministration terminated 28 of 16,343 active con-
22 tracts and orders—a termination rate of about 0.17
23 percent.

24 (5) Providing processes requiring congressional
25 action on termination of these high-priority pro-

1 grams would enable contractors to apply taxpayer
2 dollars to making maximum progress in meeting the
3 established technical goals and schedule milestones
4 of these programs.

5 (b) NASA TERMINATION LIABILITY.—

6 (1) GENERAL RULE.—Termination liability
7 costs for a covered program shall be provided only
8 pursuant to this subsection.

9 (2) PROHIBITION ON RESERVING FUNDS.—The
10 Administrator may not reserve funds from amounts
11 appropriated for a covered program, and shall direct
12 prime contractors not to reserve funds, for potential
13 termination liability costs with respect to a covered
14 program.

15 (3) INTENT OF CONGRESS.—It is the intent of
16 Congress that funds authorized to be appropriated
17 for covered programs be applied in meeting estab-
18 lished technical goals and schedule milestones.

19 (4) VOID CONTRACTUAL PROVISIONS.—Any
20 provision in a prime contract entered into before the
21 date of enactment of this Act that provides for the
22 payment of termination liability costs through any
23 means other than as provided in this subsection is
24 hereby declared to be void and unenforceable.

25 (5) CONGRESSIONAL ACTION; NOTICE.—

1 (A) TERMINATION FOR CONVENIENCE.—

2 The Administrator may not initiate termination
3 for the convenience of the Government of a
4 prime contract on a covered program unless
5 such program termination is authorized or re-
6 quired by a law enacted after the date of enact-
7 ment of this Act.

8 (B) TERMINATION FOR CAUSE.—The Ad-
9 ministrator shall notify the Committee on
10 Science, Space, and Technology of the House of
11 Representatives and the Committee on Com-
12 merce, Science, and Transportation of the Sen-
13 ate before initiating termination for cause of a
14 prime contract on a covered program.

15 (6) SUPPLEMENTAL APPROPRIATION RE-
16 QUEST.—

17 (A) REQUEST.—If the Administrator de-
18 cides to terminate a prime contract on a cov-
19 ered program, and sufficient unobligated appro-
20 priations are not available to cover termination
21 liability costs in the appropriations account that
22 is funding the prime contract being terminated,
23 the Administrator shall provide to Congress a
24 notification that an authorization of appropria-
25 tions is necessary not later than 120 days in

1 advance of the proposed contract settlement for
2 the covered program.

3 (B) INTENT OF CONGRESS.—It is the in-
4 tent of Congress to provide additional author-
5 ization for appropriations as may be necessary
6 to pay termination liability costs on prime con-
7 tracts for covered programs if Congress deems
8 it appropriate that the Administration termi-
9 nate such prime contracts.

10 (7) DEFINITIONS.—For purposes of this sec-
11 tion:

12 (A) COVERED PROGRAM.—The term “cov-
13 ered program” means the International Space
14 Station, the Space Launch System, and the
15 Orion crew capsule.

16 (B) PRIME CONTRACTOR.—The term
17 “prime contractor” means a person or entity
18 contracting directly with the Federal Govern-
19 ment on a covered program.

20 (C) TERMINATION LIABILITY COSTS.—The
21 term “termination liability costs” means any
22 costs incurred by a prime contractor, or by any
23 subcontractor of a prime contractor, for which
24 the Federal Government is liable as a result of

1 termination of a prime contract by the Adminis-
2 trator.

3 (c) REPORTING.—Not later than 6 months after the
4 date of enactment of this Act, and every 6 months there-
5 after for the duration of the prime contracts on covered
6 programs, the Administrator shall transmit to the Com-
7 mittee on Science, Space, and Technology of the House
8 of Representatives and the Committee on Commerce,
9 Science, and Transportation of the Senate a report that
10 provides—

11 (1) the estimated termination liability costs for
12 each of the prime contracts; and

13 (2) the basis for how such estimate was deter-
14 mined.

15 **SEC. 703. INDEMNIFICATION EXTENSION.**

16 Section 50915(f) of title 51, United States Code, is
17 amended by striking “December 31, 2013” and inserting
18 “December 31, 2018”.

19 **SEC. 704. BASELINE AND COST CONTROLS.**

20 Section 30104 of title 51, United States Code, is
21 amended—

22 (1) in subsection (a), by striking “Procedural
23 Requirements 7120.5c, dated March 22, 2005” and
24 inserting “Procedural Requirements 7120.5E, dated
25 August 14, 2012”; and

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

6 **SEC. 705. PROJECT AND PROGRAM RESERVES.**

7 To ensure that the establishment, maintenance, and
8 allotment of project and program reserves contribute to
9 prudent management, not later than 180 days after the
10 date of enactment of this Act, the Administrator shall
11 transmit to the Committee on Science, Space, and Tech-
12 nology of the House of Representatives and the Committee
13 on Commerce, Science, and Transportation of the Senate
14 a report describing the Administration’s criteria for estab-
15 lishing the amount of reserves at the project and program
16 levels and how such criteria complement the Administra-
17 tion’s policy of budgeting at a 70-percent confidence level.

18 **SEC. 706. INDEPENDENT REVIEWS.**

19 Not later than 270 days after the date of enactment
20 of this Act, the Administrator shall transmit to the Com-
21 mittee on Science, Space, and Technology of the House
22 of Representatives and the Committee on Commerce,
23 Science, and Transportation of the Senate a report de-
24 scribing the Administration’s procedures for conducting
25 independent reviews of projects and programs at lifecycle

1 milestones and how the Administration ensures the inde-
2 pendence of the individuals who conduct those reviews
3 prior to their assignment.

4 **SEC. 707. SPACE ACT AGREEMENTS.**

5 (a) **COST SHARING.**—To the extent that the Adminis-
6 trator determines practicable, the funds provided by the
7 Government under a funded Space Act Agreement shall
8 not exceed the total amount provided by other parties to
9 the Space Act Agreement.

10 (b) **NEED.**—A Space Act Agreement may be used
11 only when the use of a standard contract, grant, or cooper-
12 ative agreement is not feasible or appropriate, as deter-
13 mined by the Associate Administrator for Procurement.

14 (c) **PUBLIC NOTICE AND COMMENT.**—The Adminis-
15 trator shall make available for public notice and comment
16 each proposed Space Act Agreement at least 30 days be-
17 fore entering into such agreement, with appropriate
18 redactions for proprietary, sensitive, or classified informa-
19 tion.

20 (d) **TRANSPARENCY.**—The Administrator shall pub-
21 licly disclose on the Administration’s website and make
22 available in a searchable format all Space Act Agreements,
23 with appropriate redactions for proprietary, sensitive, or
24 classified information, not later than 60 days after such
25 agreement is signed.

1 (e) AUTHORIZATION.—The Administrator may not
2 enter into a funded Space Act Agreement for an amount
3 in excess of \$50,000,000 unless such agreement has been
4 specifically authorized by law.

5 (f) ANNUAL REPORT.—

6 (1) REQUIREMENT.—Not later than 90 days
7 after the end of each fiscal year, the Administrator
8 shall submit to the Committee on Science, Space,
9 and Technology of the House of Representatives and
10 the Committee on Commerce, Science, and Trans-
11 portation of the Senate a report on the use of Space
12 Act Agreement authority by the Administration dur-
13 ing the previous fiscal year.

14 (2) CONTENTS.—The report shall include for
15 each Space Act Agreement in effect at the time of
16 the report—

17 (A) an indication of whether the agreement
18 is a reimbursable, nonreimbursable, or funded
19 Space Act Agreement;

20 (B) a description of—

21 (i) the subject and terms;

22 (ii) the parties;

23 (iii) the responsible—

24 (I) mission directorate;

25 (II) center; or

- 1 (III) headquarters element;
- 2 (iv) the value;
- 3 (v) the extent of the cost sharing
- 4 among Federal Government and non-Fed-
- 5 eral sources;
- 6 (vi) the time period or schedule; and
- 7 (vii) all milestones; and
- 8 (C) an indication of whether the agreement
- 9 was renewed during the previous fiscal year.

10 (3) ANTICIPATED AGREEMENTS.—The report

11 shall also include a list of all anticipated reimburs-

12 able, nonreimbursable, and funded Space Act Agree-

13 ments for the upcoming fiscal year.

14 (4) CUMULATIVE PROGRAM BENEFITS.—The

15 report shall also include, with respect to the Space

16 Act Agreements covered by the report, a summary

17 of—

18 (A) the technology areas in which research

19 projects were conducted under such agreements;

20 (B) the extent to which the use of the

21 Space Act Agreements—

22 (i) has contributed to a broadening of

23 the technology and industrial base avail-

24 able for meeting Administration needs; and

1 (ii) has fostered within the technology
2 and industrial base new relationships and
3 practices that support the United States;
4 and

5 (C) the total amount of value received by
6 the Federal Government during the fiscal year
7 pursuant to such Space Act Agreements.

8 **SEC. 708. HUMAN SPACEFLIGHT ACCIDENT INVESTIGA-**
9 **TIONS.**

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

13 “(3) any other space vehicle carrying humans
14 that is owned by the Federal Government or that is
15 being used pursuant to a contract or Space Act
16 Agreement, as defined in section 2 of the with the
17 Federal Government; or”.

18 **SEC. 709. COMMERCIAL TECHNOLOGY TRANSFER PRO-**
19 **GRAM.**

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

23 **SEC. 710. ORBITAL DEBRIS.**

24 (a) FINDING.—Congress finds that orbital debris
25 poses serious risks to the operational space capabilities of

1 the United States and that an international consensus and
2 strategic plan is needed to mitigate the growth of orbital
3 debris wherever possible.

4 (b) REPORTS.—

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

17 (2) MITIGATION STRATEGY.—Not later than 90
18 days after the date of enactment of this Act, the Di-
19 rector of the Office of Science and Technology Policy
20 shall provide the Committee on Science, Space, and
21 Technology of the House of Representatives and the
22 Committee on Commerce, Science, and Transpor-
23 tation of the Senate with a report on the status of
24 the orbital debris mitigation strategy required under
25 section 1202(b)(2) of the National Aeronautics and

1 Space Administration Authorization Act of 2010 (42
2 U.S.C. 18441(b)(2)).

3 **SEC. 711. NASA LEADERSHIP.**

4 Section 20111 of title 51, United States Code, is
5 amended—

6 (1) in subsection (a), by inserting “The Admin-
7 istrator shall serve for a term of 6 years, and may
8 be reappointed for additional terms.” after “and ac-
9 tivities thereof.”; and

10 (2) in subsection (b)—

11 (A) by inserting “The Deputy Adminis-
12 trator may not act for, and exercise the powers
13 of, the Administrator for a period in excess of
14 45 days. After 45 days, the Associate Adminis-
15 trator shall exercise the powers of the Adminis-
16 trator until a new Administrator is appointed
17 and confirmed by the Senate.” after “absence
18 or disability.”; and

19 (B) by striking “from civilian life”.

20 **SEC. 712. NASA ADVISORY COUNCIL.**

21 (a) ESTABLISHMENT.—Subchapter II of chapter 201
22 of title 51, United States Code, is amended by adding at
23 the end the following new section:

1 **“§ 20118. NASA Advisory Council**

2 “(a) ESTABLISHMENT.—There shall be established a
3 NASA Advisory Council (in this section referred to as ‘the
4 Council’) for the Administration in accordance with this
5 section, not later than 9 months after the date of enact-
6 ment of this section.

7 “(b) MEMBERSHIP AND APPOINTMENT.—The Coun-
8 cil shall consist of 11 members to be appointed as follows:

9 “(1) 5 members shall be appointed by the
10 President.

11 “(2) 2 members shall be appointed by the
12 President pro tempore of the Senate.

13 “(3) 1 member shall be appointed by the minor-
14 ity leader of the Senate.

15 “(4) 2 members shall be appointed by the
16 Speaker of the House of Representatives.

17 “(5) 1 member shall be appointed by the minor-
18 ity leader of the House of Representatives.

19 In addition to the members appointed under paragraphs
20 (1) through (5), the Administrator shall be an ex officio,
21 nonvoting member of the Council. Members of the Council
22 shall comply with the Federal Advisory Committee Act (5
23 U.S.C. App.) and the Ethics in Government Act of 1978
24 (5 U.S.C. App.).

25 “(c) QUALIFICATIONS.—The persons appointed as
26 members of the Council shall be—

1 “(1) former astronauts or scientists or engi-
2 neers eminent in the fields of human spaceflight,
3 planetary science, space science, Earth science, aero-
4 nautics, or disciplines related to space exploration
5 and aeronautics, including other scientific, engineer-
6 ing, or business disciplines;

7 “(2) selected on the basis of established records
8 of distinguished service; and

9 “(3) so selected as to provide representation of
10 the views of engineering, science, and aerospace
11 leaders in all areas of the Nation.

12 “(d) TERMS.—The term of office of each member of
13 the Council shall be 6 years.

14 “(e) MEETINGS.—The Council shall meet two times
15 annually at minimum and at such other times as the
16 Chairman may determine, but the Chairman shall also call
17 a meeting whenever one-third of the members so request
18 in writing. The Council shall adopt procedures governing
19 the conduct of its meetings, including delivery of notice
20 and a definition of a quorum, which in no case shall be
21 less than one-half plus one of the members of the Council.

22 “(f) CHAIRMAN AND VICE CHAIRMAN.—The Chair-
23 man and Vice Chairman of the Council shall be elected
24 by a majority vote of the Council for a two-year term. A
25 member may serve as Chairman and Vice Chairman for

1 up to three terms. The Vice Chairman shall perform the
2 duties of the Chairman in his absence. If a vacancy occurs
3 in the chairmanship or vice chairmanship, the Council
4 shall elect a member to fill such vacancy.

5 “(g) STAFF.—The Administrator shall support the
6 Council with professional staff to provide for the perform-
7 ance of such duties as may be prescribed by the Council.

8 “(h) COMMITTEES.—The Council is authorized to ap-
9 point from among its members such committees as it
10 deems necessary and to assign to committees so appointed
11 such survey and advisory functions as the Council deems
12 appropriate to assist it in exercising its powers and func-
13 tions.

14 “(i) FUNCTIONS.—

15 “(1) BUDGET PROPOSAL.—

16 “(A) REVIEW OF PROPOSAL.—Not later
17 than October 15 of each year, the Council shall
18 have reviewed the Administration’s proposed
19 budget for the next fiscal year and shall provide
20 to the President their advice based on the best
21 professional judgment of a majority of mem-
22 bers. Portions of Council meetings in which the
23 Council considers the budget proposal for the
24 next fiscal year may be closed to the public

1 until the Council submits the proposal to the
2 President and Congress.

3 “(B) ADVICE TO CONGRESSIONAL COMMIT-
4 TEES.—Not later than 14 days following the
5 President’s budget submittal to Congress for
6 the next fiscal year, the Council shall provide to
7 the Committee on Science, Space, and Tech-
8 nology of the House of Representatives and the
9 Committee on Commerce, Science, and Trans-
10 portation of the Senate their advice based on
11 the best professional judgment of a majority of
12 members.

13 “(2) ADVICE TO THE PRESIDENT AND CON-
14 GRESS.—The Council shall report their findings, ad-
15 vice, and recommendations to the President and
16 Congress on matters of particular policy interest on
17 space exploration and aeronautics based on the best
18 professional judgment of a majority of members.”.

19 (b) TABLE OF SECTIONS.—The table of sections for
20 chapter 201 of title 51, United States Code, is amended
21 by adding at the end of the items for subchapter II the
22 following new item:

 “20118. NASA Advisory Council.”.

23 (c) CONSULTATION AND ADVICE.—Section 20113(g)
24 of title 51, United States Code, is amended by inserting
25 “and Congress” after “advice to the Administration”.

1 **SEC. 713. COST ESTIMATION.**

2 (a) REPORT.—Not later than 90 days after the date
3 of enactment of this Act, the Administrator shall transmit
4 to the Committee on Science, Space, and Technology of
5 the House of Representatives and the Committee on Com-
6 merce, Science, and Transportation of the Senate a report
7 on current and continuing efforts to implement more effec-
8 tive cost-estimation practices.

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

11 (1) a list of steps the Administration is under-
12 taking to advance consistent implementation of the
13 joint cost and schedule level (JCL) process; and

14 (2) a description of mechanisms the Adminis-
15 tration is using and will continue to use to ensure
16 that adequate resources are dedicated to cost esti-
17 mation.

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