

111<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

# S. 3729

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## AN ACT

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2011 through 2013, 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,*

1 **SEC. 1. SHORT TITLE; TABLE OF CONTENTS.**

2 (a) SHORT TITLE.—This Act may be cited as the  
 3 “National Aeronautics and Space Administration Author-  
 4 ization Act of 2010”.

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

Sec. 1. Short title; table of contents.

Sec. 2. Findings.

Sec. 3. Definitions.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

Sec. 101. Fiscal year 2011.

Sec. 102. Fiscal year 2012.

Sec. 103. Fiscal year 2013.

TITLE II—POLICY, GOALS, AND OBJECTIVES FOR HUMAN SPACE  
 FLIGHT AND EXPLORATION

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Sec. 202. Goals and objectives.

Sec. 203. Assurance of core capabilities.

Sec. 204. Independent study on human exploration of space.

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Sec. 302. Space Launch System as follow-on launch vehicle to the Space Shut-  
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 Launch System and multi-purpose crew vehicle.

Sec. 305. NASA launch support and infrastructure modernization program.

Sec. 306. Report on effects of transition to Space Launch System on the solid  
 and liquid rocket motor industrial bases.

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 near-Earth space missions.

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TITLE IV—DEVELOPMENT AND USE OF COMMERCIAL CREW AND  
 CARGO TRANSPORTATION CAPABILITIES

Sec. 401. Commercial Cargo Development program.

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Sec. 403. Requirements applicable to development of commercial crew transpor-  
 tation capabilities and services.

Sec. 404. Report on International Space Station cargo return capability.

TITLE V—CONTINUATION, SUPPORT, AND EVOLUTION OF THE  
INTERNATIONAL SPACE STATION

- Sec. 501. Continuation of the International Space Station through 2020.
- Sec. 502. Maximum utilization of the International Space Station.
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- Sec. 504. Management of the ISS national laboratory.

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- Sec. 601. Sense of Congress on the Space Shuttle program.
- Sec. 602. Retirement of Space Shuttle orbiters and transition of Space Shuttle program.
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TITLE VII—EARTH SCIENCE

- Sec. 701. Sense of Congress.
- Sec. 702. Interagency collaboration implementation approach.
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- Sec. 704. Decadal survey missions implementation for Earth observation.
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- Sec. 706. Instrument test-beds and venture class missions.
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TITLE VIII—SPACE SCIENCE

- Sec. 801. Technology development.
- Sec. 802. Suborbital research activities.
- Sec. 803. Overall science portfolio-sense of the Congress.
- Sec. 804. In-space servicing.
- Sec. 805. Decadal results.
- Sec. 806. On-going restoration of radioisotope thermoelectric generator material production.
- Sec. 807. Collaboration with ESMD and SOMD on robotic missions.
- Sec. 808. Near-Earth object survey and policy with respect to threats posed.
- Sec. 809. Space weather.

TITLE IX—AERONAUTICS AND SPACE TECHNOLOGY

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- Sec. 902. Aeronautics research goals.
- Sec. 903. Research collaboration.
- Sec. 904. Goal for agency space technology.
- Sec. 905. Implementation plan for agency space technology.
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TITLE X—EDUCATION

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- Sec. 1002. Sense of Congress on the Experimental Program to Stimulate Competitive Research.
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TITLE XI—RESCOPING AND REVITALIZING INSTITUTIONAL  
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- Sec. 1101. Sense of Congress.
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- Sec. 1210. Sense of Congress concerning the Stennis Space Center.

TITLE XIII—COMPLIANCE WITH STATUTORY PAY-AS-YOU-GO ACT  
OF 2010

- Sec. 1301. Compliance provision.

**1 SEC. 2. FINDINGS.**

2 Congress makes the following findings:

3 (1) The United States human space flight pro-  
4 gram has, since the first Mercury flight on May 5,  
5 1961, been a source of pride and inspiration for the  
6 Nation.

7 (2) The establishment of and commitment to  
8 human exploration goals is essential for providing  
9 the necessary long term focus and programmatic  
10 consistency and robustness of the United States ci-  
11 vilian space program.

12 (3) The National Aeronautics and Space Ad-  
13 ministration is and should remain a multi-mission

1 agency with a balanced and robust set of core mis-  
2 sions in science, aeronautics, and human space flight  
3 and exploration.

4 (4) In the 50 years since the establishment of  
5 NASA, the arena of space has evolved substantially.  
6 As the uses and users of space continue to expand,  
7 the issues and operations in the regions closest to  
8 Earth have become increasingly complex, with a  
9 growing number of overlaps between civil, commer-  
10 cial and national security activities. These develop-  
11 ments present opportunities and challenges to the  
12 space activities of NASA and the United States.

13 (5) The extraordinary challenges of achieving  
14 access to space both motivated and accelerated the  
15 development of technologies and industrial capabili-  
16 ties that have had widespread applications which  
17 have contributed to the technological excellence of  
18 the United States. It is essential to tie space activity  
19 to human challenges ranging from enhancing the in-  
20 fluence, relationships, security, economic develop-  
21 ment, and commerce of the United States to improv-  
22 ing the overall human condition.

23 (6) It is essential to the economic well-being of  
24 the United States that the aerospace industrial ca-  
25 pacity, highly skilled workforce, and embedded ex-

1     pertise remain engaged in demanding, challenging,  
2     and exciting efforts that ensure United States lead-  
3     ership in space exploration and related activities.

4             (7) Crewmembers provide the essential compo-  
5     nent to ensure the return on investment from and  
6     the growth and safe operation of the ISS. The Rus-  
7     sian Soyuz vehicle has allowed continued human  
8     presence on the ISS for United States crewmembers  
9     with its ability to serve as both a routine and backup  
10    capability for crew delivery, rescue, and return. With  
11    the impending retirement of the Space Shuttle, the  
12    United States will find itself with no national crew  
13    delivery and return system. Without any other sys-  
14    tem, the United States and all the ISS partners will  
15    have no redundant system for human access to and  
16    from the ISS. It is therefore essential that a United  
17    States capability be developed as soon as possible.

18            (8) Existing and emerging United States com-  
19    mercial launch capabilities and emerging launch ca-  
20    pabilities offer the potential for providing crew sup-  
21    port assets. New capabilities for human crew access  
22    to the ISS should be developed in a manner that en-  
23    sures ISS mission assurance and safety. Commercial  
24    services offer the potential to broaden the avail-  
25    ability and access to space at lower costs.

1           (9) While commercial transportation systems  
2 have the promise to contribute valuable services, it  
3 is in the United States national interest to maintain  
4 a government operated space transportation system  
5 for crew and cargo delivery to space.

6           (10) Congress restates its commitment, ex-  
7 pressed in the National Aeronautics and Space Ad-  
8 ministration Authorization Act of 2005 (Public Law  
9 109–155) and the National Aeronautics and Space  
10 Administration Authorization Act of 2008 (Public  
11 Law 110–422), to the development of commercially  
12 developed launch and delivery systems to the ISS for  
13 crew and cargo missions. Congress reaffirms that  
14 NASA shall make use of United States commercially  
15 provided ISS crew transfer and crew rescue services  
16 to the maximum extent practicable.

17           (11) It is critical to identify an appropriate  
18 combination of NASA and related United States  
19 Government programs, while providing a framework  
20 that allows partnering, leveraging and stimulation of  
21 the existing and emerging commercial and inter-  
22 national efforts in both near Earth space and the re-  
23 gions beyond.

24           (12) The designation of the United States seg-  
25 ment of the ISS as a National Laboratory, as pro-

1 vided by the National Aeronautics and Space Ad-  
2 ministration Authorization Act of 2005 and the Na-  
3 tional Aeronautics and Space Administration Au-  
4 thorization Act of 2008, provides an opportunity for  
5 multiple United States Government agencies, univer-  
6 sity-based researchers, research organizations, and  
7 others to utilize the unique environment of micro-  
8 gravity for fundamental scientific research and po-  
9 tential economic development.

10 (13) For some potential replacement elements  
11 necessary for ISS sustainability, the Space Shuttle  
12 may represent the only vehicle, existing or planned,  
13 capable of carrying those elements to the ISS in the  
14 near term. Additional or alternative transportation  
15 capabilities must be identified as contingency deliv-  
16 ery options, and accompanied by an independent  
17 analysis of projected availability of such capabilities.

18 (14) The United States must develop, as rap-  
19 idly as possible, replacement vehicles capable of pro-  
20 viding both human and cargo launch capability to  
21 low-Earth orbit and to destinations beyond low-  
22 Earth orbit.

23 (15) There is a need for national space and ex-  
24 port control policies that protect the national secu-  
25 rity of the United States while also enabling the



1 United States and its aerospace industry to under-  
2 take cooperative programs in science and human  
3 space flight in an effective and efficient manner and  
4 to compete effectively in the global market place.

5 **SEC. 3. DEFINITIONS.**

6 In this Act:

7 (1) ADMINISTRATOR.—The term “Adminis-  
8 trator” means the Administrator of the National  
9 Aeronautics and Space Administration.

10 (2) APPROPRIATE COMMITTEES OF CON-  
11 GRESS.—The term “appropriate committees of Con-  
12 gress” means—

13 (A) the Committee on Commerce, Science,  
14 and Transportation of the Senate; and

15 (B) the Committee on Science of the  
16 House of Representatives.

17 (3) CIS-LUNAR SPACE.—The term “cis-lunar  
18 space” means the region of space from the Earth  
19 out to and including the region around the surface  
20 of the Moon.

21 (4) DEEP SPACE.—The term “deep space”  
22 means the region of space beyond cis-lunar space.

23 (5) ISS.—The term “ISS” means the Inter-  
24 national Space Station.

1           (6) NASA.—The term “NASA” means the Na-  
2 tional Aeronautics and Space Administration.

3           (7) NEAR-EARTH SPACE.—The term “near-  
4 Earth space” means the region of space that in-  
5 cludes low-Earth orbit and extends out to and in-  
6 cludes geo-synchronous orbit.

7           (8) NOAA.—The term “NOAA” means the Na-  
8 tional Oceanic and Atmospheric Administration.

9           (9) OSTP.—The term “OSTP” means the Of-  
10 fice of Science and Technology Policy.

11           (10) SPACE LAUNCH SYSTEM.—The term  
12 “Space Launch System” means the follow-on gov-  
13 ernment-owned civil launch system developed, man-  
14 aged, and operated by NASA to serve as a key com-  
15 ponent to expand human presence beyond low-Earth  
16 orbit.

17           **TITLE I—AUTHORIZATION OF**  
18           **APPROPRIATIONS**

19           **SEC. 101. FISCAL YEAR 2011.**

20           There are authorized to be appropriated to NASA for  
21 fiscal year 2011, \$19,000,000,000, as follows:

22           (1) For Exploration, \$3,868,000,000, of  
23 which—

1 (A) \$1,120,000,000 shall be for a multi-  
2 purpose crew vehicle, and associated program  
3 and other necessary support;

4 (B) \$1,631,000,000 shall be for Space  
5 Launch System and associated program and  
6 other necessary support;

7 (C) \$250,000,000 shall be for Exploration  
8 Technology Development;

9 (D) \$155,000,000 shall be for Human Re-  
10 search;

11 (E) \$300,000,000 shall be for Commercial  
12 Cargo;

13 (F) \$312,000,000 shall be for Commercial  
14 Crew Development activities and studies related  
15 to commercial crew services; and

16 (G) \$100,000,000 shall be for Robotic Pre-  
17 cursor Studies and Instruments.

18 (2) For Space Operations, \$5,508,500,000, of  
19 which—

20 (A) \$2,779,800,000 shall be for the ISS  
21 program;

22 (B) \$1,609,700,000 shall be for Space  
23 Shuttle, to support Space Shuttle flight oper-  
24 ations and related activities; and

1           (C) \$1,119,000,000 for Space and Flight  
2 Services, of which \$428,600,000 shall be di-  
3 rected toward NASA launch support and infra-  
4 structure modernization program.

5           (3) For Science, \$5,005,600,000, of which—

6           (A) \$1,801,800,000 shall be for Earth  
7 Sciences;

8           (B) \$1,485,700,000 shall be for Planetary  
9 Science;

10          (C) \$1,076,300,000 shall be for Astro-  
11 physics; and

12          (D) \$641,900,000 shall be for  
13 Heliophysics.

14          (4) For Aeronautics, \$929,600,000, of which—

15          (A) \$579,600,000 shall be for Aeronautics  
16 Research; and

17          (B) \$350,000,000 shall be for Space Tech-  
18 nology.

19          (5) For Education, \$145,800,000, of which—

20          (A) \$25,000,000 shall be for the Experi-  
21 mental Program to Stimulate Competitive Re-  
22 search; and

23          (B) \$45,600,000 shall be for the Space  
24 Grant program.

1           (6) For Cross-Agency Support Programs,  
2           \$3,111,400,000.

3           (7) For Construction and Environmental Com-  
4           pliance and Restoration, \$394,300,000.

5           (8) For Inspector General, \$37,000,000.

6 **SEC. 102. FISCAL YEAR 2012.**

7           There are authorized to be appropriated to NASA for  
8           fiscal year 2012, \$19,450,000,000, as follows:

9           (1) For Exploration, \$5,252,300,000, of  
10          which—

11           (A) \$1,400,000,000 shall be for a multi-  
12           purpose crew vehicle and associated program  
13           and other necessary support;

14           (B) \$2,650,000,000 shall be for Space  
15           Launch System and associated program and  
16           other necessary support;

17           (C) \$437,300,000 shall be for Exploration  
18           Technology Development;

19           (D) \$165,000,000 shall be for Human Re-  
20           search;

21           (E) \$500,000,000 shall be for commercial  
22           crew capabilities; and

23           (F) \$100,000,000 shall be for Robotic Pre-  
24           cursor Instruments and Low-Cost Missions.

1           (2) For Space Operations, \$4,141,500,000, of  
2       which—

3           (A) \$2,952,250,000 shall be for the ISS  
4       operations and crew/cargo support; and

5           (B) \$1,189,250,000 shall be for Space and  
6       Flight Services, of which \$500,000,000 shall be  
7       directed toward the NASA launch support and  
8       infrastructure modernization program.

9       (3) For Science, \$5,248,600,000, of which—

10           (A) \$1,944,500,000 shall be for Earth  
11       Sciences;

12           (B) \$1,547,200,000 shall be for Planetary  
13       Science;

14           (C) \$1,109,300,000 shall be for Astro-  
15       physics; and

16           (D) \$647,600,000 shall be for  
17       Heliophysics.

18       (4) For Aeronautics, \$1,070,600,000, of  
19       which—

20           (A) \$584,700,000 shall be for Aeronautics  
21       Research; and

22           (B) \$486,000,000 shall be for Space Tech-  
23       nology.

24       (5) For Education, \$145,800,000, of which—

1 (A) \$25,000,000 shall be for the Experi-  
2 mental Program to Stimulate Competitive Re-  
3 search; and

4 (B) \$45,600,000 shall be for the Space  
5 Grant program.

6 (6) For Cross-Agency Support Programs,  
7 \$3,189,600,000.

8 (7) For Construction and Environmental Com-  
9 pliance and Restoration, \$363,800,000.

10 (8) For Inspector General, \$37,800,000.

11 **SEC. 103. FISCAL YEAR 2013.**

12 There are authorized to be appropriated to NASA for  
13 fiscal year 2013, \$19,960,000,000, as follows:

14 (1) For Exploration, \$5,264,000,000, of  
15 which—

16 (A) \$1,400,000,000 shall be for a multi-  
17 purpose crew vehicle and associated program  
18 and other necessary support;

19 (B) \$2,640,000,000 shall be for Space  
20 Launch System and associated program and  
21 other necessary support;

22 (C) \$449,000,000 shall be for Exploration  
23 Technology Development;

24 (D) \$175,000,000 shall be for Human Re-  
25 search;

1 (E) \$500,000,000 shall be for commercial  
2 crew capabilities; and

3 (F) \$100,000,000 shall be for Robotic Pre-  
4 cursor Instruments and Low-Cost Missions.

5 (2) For Space Operations, \$4,253,300,000, of  
6 which—

7 (A) \$3,129,400,000 shall be for the ISS  
8 operations and crew/cargo support; and

9 (B) \$1,123,900,000 shall be for Space and  
10 Flight Services, of which \$400,000,000 shall be  
11 directed toward the NASA launch support and  
12 infrastructure modernization program.

13 (3) For Science, \$5,509,600,000, of which—

14 (A) \$2,089,500,000 shall be for Earth  
15 Sciences;

16 (B) \$1,591,200,000 shall be for Planetary  
17 Science;

18 (C) \$1,149,100,000 shall be for Astro-  
19 physics; and

20 (D) \$679,800,000 shall be for  
21 Heliophysics.

22 (4) For Aeronautics, \$1,105,000,000, of  
23 which—

24 (A) \$590,000,000 shall be for Aeronautics  
25 Research; and



1 (B) \$515,000,000 shall be for Space Tech-  
2 nology.

3 (5) For Education, \$145,700,000, of which—

4 (A) \$25,000,000 shall be for the Experi-  
5 mental Program to Stimulate Competitive Re-  
6 search; and

7 (B) \$45,600,000 shall be for the Space  
8 Grant program.

9 (6) For Cross-Agency Support Programs,  
10 \$3,276,800,000.

11 (7) For Construction and Environmental Com-  
12 pliance and Restoration, \$366,900,000.

13 (8) For Inspector General, \$38,700,000.

14 **TITLE II—POLICY, GOALS, AND**  
15 **OBJECTIVES FOR HUMAN**  
16 **SPACE FLIGHT AND EXPLO-**  
17 **RATION**

18 **SEC. 201. UNITED STATES HUMAN SPACE FLIGHT POLICY.**

19 (a) USE OF NON-UNITED STATES HUMAN SPACE  
20 FLIGHT TRANSPORTATION CAPABILITIES.—It is the pol-  
21 icy of the United States that reliance upon and use of non-  
22 United States human space flight capabilities shall be un-  
23 dertaken only as a contingency in circumstances where no  
24 United States-owned and operated human space flight ca-

1 pability is available, operational, and certified for flight  
2 by appropriate Federal agencies.

3 (b) UNITED STATES HUMAN SPACE FLIGHT CAPA-  
4 BILITIES.—Congress reaffirms the policy stated in section  
5 501(a) of the National Aeronautics and Space Administra-  
6 tion Authorization Act of 2005 (42 U.S.C. 16761(a)), that  
7 the United States shall maintain an uninterrupted capa-  
8 bility for human space flight and operations in low-Earth  
9 orbit, and beyond, as an essential instrument of national  
10 security and of the capacity to ensure continued United  
11 States participation and leadership in the exploration and  
12 utilization of space.

13 **SEC. 202. GOALS AND OBJECTIVES.**

14 (a) LONG TERM GOAL.—The long term goal of the  
15 human space flight and exploration efforts of NASA shall  
16 be to expand permanent human presence beyond low-  
17 Earth orbit and to do so, where practical, in a manner  
18 involving international partners.

19 (b) KEY OBJECTIVES.—The key objectives of the  
20 United States for human expansion into space shall be—

21 (1) to sustain the capability for long-duration  
22 presence in low-Earth orbit, initially through con-  
23 tinuation of the ISS and full utilization of the  
24 United States segment of the ISS as a National  
25 Laboratory, and through assisting and enabling an

1 expanded commercial presence in, and access to,  
2 low-Earth orbit, as elements of a low-Earth orbit in-  
3 frastructure;

4 (2) to determine if humans can live in an ex-  
5 tended manner in space with decreasing reliance on  
6 Earth, starting with utilization of low-Earth orbit  
7 infrastructure, to identify potential roles that space  
8 resources such as energy and materials may play, to  
9 meet national and global needs and challenges, such  
10 as potential cataclysmic threats, and to explore the  
11 viability of and lay the foundation for sustainable  
12 economic activities in space;

13 (3) to maximize the role that human explo-  
14 ration of space can play in advancing overall knowl-  
15 edge of the universe, supporting United States na-  
16 tional and economic security and the United States  
17 global competitive posture, and inspiring young peo-  
18 ple in their educational pursuits; and

19 (4) to build upon the cooperative and mutually  
20 beneficial framework established by the ISS partner-  
21 ship agreements and experience in developing and  
22 undertaking programs and meeting objectives de-  
23 signed to realize the goal of human space flight set  
24 forth in subsection (a).

1 **SEC. 203. ASSURANCE OF CORE CAPABILITIES.**

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

4 (1) the ISS, technology developments, the cur-  
5 rent Space Shuttle program, and follow-on transpor-  
6 tation systems authorized by this Act form the foun-  
7 dation of initial capabilities for missions beyond low-  
8 Earth orbit to a variety of lunar and Lagrangian or-  
9 bital locations; and

10 (2) these initial missions and related capabili-  
11 ties should be utilized to provide operational experi-  
12 ence, technology development, and the placement  
13 and assured use of in-space infrastructure and in-  
14 space servicing of existing and future assets.

15 (b) SPACE SHUTTLE CAPABILITY ASSURANCE.—

16 (1) DEVELOPMENT OF FOLLOW-ON SPACE  
17 TRANSPORTATION SYSTEMS.—The Administrator  
18 shall proceed with the development of follow-on  
19 space transportation systems in a manner that en-  
20 sures that the national capability to restart and fly  
21 Space Shuttle missions can be initiated if required  
22 by the Congress, in an Act enacted after the date of  
23 enactment of this Act, or by a Presidential deter-  
24 mination transmitted to the Congress, before the  
25 last Space Shuttle mission authorized by this Act is  
26 completed.

1           (2) REQUIRED ACTIONS.—In carrying out the  
2           requirement in paragraph (1), the Administrator  
3           shall authorize refurbishment of the manufactured  
4           external tank of the Space Shuttle, designated as  
5           ET-94, and take all actions necessary to enable its  
6           readiness for use in the Space Launch System devel-  
7           opment as a critical skills and capability retention  
8           effort or for test purposes, while preserving the abil-  
9           ity to use this tank if needed for an ISS contingency  
10          if deemed necessary under paragraph (1).

11 **SEC. 204. INDEPENDENT STUDY ON HUMAN EXPLORATION**  
12                               **OF SPACE.**

13          (a) IN GENERAL.—In fiscal year 2012 the Adminis-  
14          trator shall contract with the National Academies for a  
15          review of the goals, core capabilities, and direction of  
16          human space flight, using the goals set forth in the Na-  
17          tional Aeronautics and Space Act of 1958, the National  
18          Aeronautics and Space Administration Authorization Act  
19          of 2005, and the National Aeronautics and Space Admin-  
20          istration Authorization Act of 2008, the goals set forth  
21          in this Act, and goals set forth in any existing statement  
22          of space policy issued by the President.

23          (b) ELEMENTS.—The review shall include—

24                (1) a broad spectrum of participation with rep-  
25                resentatives of a range of disciplines, backgrounds,

1 and generations, including civil, commercial, inter-  
2 national, scientific, and national security interests;

3 (2) input from NASA's international partner  
4 discussions and NASA's Human Exploration Frame-  
5 work Team;

6 (3) an examination of the relationship of na-  
7 tional goals to foundational capabilities, robotic ac-  
8 tivities, technologies, and missions authorized by this  
9 Act;

10 (4) a review and prioritization of scientific, en-  
11 gineering, economic, and social science questions to  
12 be addressed by human space exploration to improve  
13 the overall human condition; and

14 (5) findings and recommendations for fiscal  
15 years 2014 through 2023.

16 **TITLE III—EXPANSION OF**  
17 **HUMAN SPACE FLIGHT BE-**  
18 **YOND THE INTERNATIONAL**  
19 **SPACE STATION AND LOW-**  
20 **EARTH ORBIT**

21 **SEC. 301. HUMAN SPACE FLIGHT BEYOND LOW-EARTH**  
22 **ORBIT.**

23 (a) FINDINGS.—Congress makes the following find-  
24 ings:

1           (1) The extension of the human presence from  
2 low-Earth orbit to other regions of space beyond  
3 low-Earth orbit will enable missions to the surface of  
4 the Moon and missions to deep space destinations  
5 such as near-Earth asteroids and Mars.

6           (2) The regions of cis-lunar space are accessible  
7 to other national and commercial launch capabilities,  
8 and such access raises a host of national security  
9 concerns and economic implications that inter-  
10 national human space endeavors can help to address.

11           (3) The ability to support human missions in  
12 regions beyond low-Earth orbit and on the surface  
13 of the Moon can also drive developments in emerging  
14 areas of space infrastructure and technology.

15           (4) Developments in space infrastructure and  
16 technology can stimulate and enable increased space  
17 applications, such as in-space servicing, propellant  
18 resupply and transfer, and in situ resource utiliza-  
19 tion, and open opportunities for additional users of  
20 space, whether national, commercial, or inter-  
21 national.

22           (5) A long term objective for human exploration  
23 of space should be the eventual international explo-  
24 ration of Mars.

1           (6) Future international missions beyond low-  
2 Earth orbit should be designed to incorporate capa-  
3 bility development and availability, affordability, and  
4 international contributions.

5           (7) Human space flight and future exploration  
6 beyond low-Earth orbit should be based around a  
7 pay-as-you-go approach. Requirements in new  
8 launch and crew systems authorized in this Act  
9 should be scaled to the minimum necessary to meet  
10 the core national mission capability needed to con-  
11 duct cis-lunar missions. These initial missions, along  
12 with the development of new technologies and in-  
13 space capabilities can form the foundation for mis-  
14 sions to other destinations. These initial missions  
15 also should provide operational experience prior to  
16 the further human expansion into space.

17 (b) REPORT ON INTERNATIONAL COLLABORATION.—

18           (1) REPORT REQUIRED.—Not later than 120  
19 days after the date of the enactment of this Act, the  
20 Administrator shall submit to the appropriate com-  
21 mittees of Congress a report on the following assets  
22 and capabilities:

23                   (A) Any effort by NASA to expand and en-  
24                   sure effective international collaboration on the  
25                   ISS.



1           (B) The efforts of NASA, including its ap-  
2           proach and progress, in defining near-term, cis-  
3           lunar space human missions.

4           (2) NASA CONTRIBUTIONS.—In preparing the  
5           report required by paragraph (1), the Administrator  
6           shall assume that NASA will contribute to the ef-  
7           forts described in that paragraph the following:

8                   (A) A Space Launch System.

9                   (B) A multi-purpose crew vehicle.

10                   (C) Such other technology elements the  
11           Administrator may consider appropriate, and  
12           which the Administrator shall specifically iden-  
13           tify in the report.

14   **SEC. 302. SPACE LAUNCH SYSTEM AS FOLLOW-ON LAUNCH**  
15                   **VEHICLE TO THE SPACE SHUTTLE.**

16           (a) UNITED STATES POLICY.—It is the policy of the  
17           United States that NASA develop a Space Launch System  
18           as a follow-on to the Space Shuttle that can access cis-  
19           lunar space and the regions of space beyond low-Earth  
20           orbit in order to enable the United States to participate  
21           in global efforts to access and develop this increasingly  
22           strategic region.

23           (b) INITIATION OF DEVELOPMENT.—

24                   (1) IN GENERAL.—The Administrator shall, as  
25           soon as practicable after the date of the enactment

1 of this Act, initiate development of a Space Launch  
2 System meeting the minimum capabilities require-  
3 ments specified in subsection (c).

4 (2) MODIFICATION OF CURRENT CONTRACTS.—

5 In order to limit NASA's termination liability costs  
6 and support critical capabilities, the Administrator  
7 shall, to the extent practicable, extend or modify ex-  
8 isting vehicle development and associated contracts  
9 necessary to meet the requirements in paragraph  
10 (1), including contracts for ground testing of solid  
11 rocket motors, if necessary, to ensure their avail-  
12 ability for development of the Space Launch System.

13 (c) MINIMUM CAPABILITY REQUIREMENTS.—

14 (1) IN GENERAL.—The Space Launch System  
15 developed pursuant to subsection (b) shall be de-  
16 signed to have, at a minimum, the following:

17 (A) The initial capability of the core ele-  
18 ments, without an upper stage, of lifting pay-  
19 loads weighing between 70 tons and 100 tons  
20 into low-Earth orbit in preparation for transit  
21 for missions beyond low-Earth orbit.

22 (B) The capability to carry an integrated  
23 upper Earth departure stage bringing the total  
24 lift capability of the Space Launch System to  
25 130 tons or more.

1           (C) The capability to lift the multipurpose  
2 crew vehicle.

3           (D) The capability to serve as a backup  
4 system for supplying and supporting ISS cargo  
5 requirements or crew delivery requirements not  
6 otherwise met by available commercial or part-  
7 ner-supplied vehicles.

8           (2) FLEXIBILITY.—The Space Launch System  
9 shall be designed from inception as a fully-integrated  
10 vehicle capable of carrying a total payload of 130  
11 tons or more into low-Earth orbit in preparation for  
12 transit for missions beyond low-Earth orbit. The  
13 Space Launch System shall, to the extent prac-  
14 ticable, incorporate capabilities for evolutionary  
15 growth to carry heavier payloads. Developmental  
16 work and testing of the core elements and the upper  
17 stage should proceed in parallel subject to appropria-  
18 tions. Priority should be placed on the core elements  
19 with the goal for operational capability for the core  
20 elements not later than December 31, 2016.

21           (3) TRANSITION NEEDS.—The Administrator  
22 shall ensure critical skills and capabilities are re-  
23 tained, modified, and developed, as appropriate, in  
24 areas related to solid and liquid engines, large di-  
25 ameter fuel tanks, rocket propulsion, and other

1 ground test capabilities for an effective transition to  
2 the follow-on Space Launch System.

3 (4) The capacity for efficient and timely evo-  
4 lution, including the incorporation of new tech-  
5 nologies, competition of sub-elements, and commer-  
6 cial operations.

7 **SEC. 303. MULTI-PURPOSE CREW VEHICLE.**

8 (a) INITIATION OF DEVELOPMENT.—

9 (1) IN GENERAL.—The Administrator shall con-  
10 tinue the development of a multi-purpose crew vehi-  
11 cle to be available as soon as practicable, and no  
12 later than for use with the Space Launch System.  
13 The vehicle shall continue to advance development of  
14 the human safety features, designs, and systems in  
15 the Orion project.

16 (2) GOAL FOR OPERATIONAL CAPABILITY.—It  
17 shall be the goal to achieve full operational capa-  
18 bility for the transportation vehicle developed pursu-  
19 ant to this subsection by not later than December  
20 31, 2016. For purposes of meeting such goal, the  
21 Administrator may undertake a test of the transpor-  
22 tation vehicle at the ISS before that date.

23 (b) MINIMUM CAPABILITY REQUIREMENTS.—The  
24 multi-purpose crew vehicle developed pursuant to sub-

1 section (a) shall be designed to have, at a minimum, the  
2 following:

3 (1) The capability to serve as the primary crew  
4 vehicle for missions beyond low-Earth orbit.

5 (2) The capability to conduct regular in-space  
6 operations, such as rendezvous, docking, and extra-  
7 vehicular activities, in conjunction with payloads de-  
8 livered by the Space Launch System developed pur-  
9 suant to section 302, or other vehicles, in prepara-  
10 tion for missions beyond low-Earth orbit or servicing  
11 of assets described in section 804, or other assets in  
12 cis-lunar space.

13 (3) The capability to provide an alternative  
14 means of delivery of crew and cargo to the ISS, in  
15 the event other vehicles, whether commercial vehicles  
16 or partner-supplied vehicles, are unable to perform  
17 that function.

18 (4) The capacity for efficient and timely evo-  
19 lution, including the incorporation of new tech-  
20 nologies, competition of sub-elements, and commer-  
21 cial operations.

1 **SEC. 304. UTILIZATION OF EXISTING WORKFORCE AND AS-**  
2 **SETS IN DEVELOPMENT OF SPACE LAUNCH**  
3 **SYSTEM AND MULTI-PURPOSE CREW VEHI-**  
4 **CLE.**

5 (a) IN GENERAL.—In developing the Space Launch  
6 System pursuant to section 302 and the multi-purpose  
7 crew vehicle pursuant to section 303, the Administrator  
8 shall, to the extent practicable utilize—

9 (1) existing contracts, investments, workforce,  
10 industrial base, and capabilities from the Space  
11 Shuttle and Orion and Ares 1 projects, including—

12 (A) space-suit development activities for  
13 application to, and coordinated development of,  
14 a multi-purpose crew vehicle suit and associated  
15 life-support requirements with potential devel-  
16 opment of standard NASA-certified suit and  
17 life support systems for use in alternative com-  
18 mercially-developed crew transportation sys-  
19 tems; and

20 (B) Space Shuttle-derived components and  
21 Ares 1 components that use existing United  
22 States propulsion systems, including liquid fuel  
23 engines, external tank or tank-related capa-  
24 bility, and solid rocket motor engines; and

1           (2) associated testing facilities, either in being  
2           or under construction as of the date of enactment of  
3           this Act.

4           (b) DISCHARGE OF REQUIREMENTS.—In meeting the  
5 requirements of subsection (a), the Administrator—

6           (1) shall, to the extent practicable, utilize  
7           ground-based manufacturing capability, ground test-  
8           ing activities, launch and operations infrastructure,  
9           and workforce expertise;

10          (2) shall, to the extent practicable, minimize the  
11          modification and development of ground infrastruc-  
12          ture and maximize the utilization of existing soft-  
13          ware, vehicle, and mission operations processes;

14          (3) shall complete construction and activation  
15          of the A-3 test stand with a completion goal of Sep-  
16          tember 30, 2013;

17          (4) may procure, develop, and flight test appli-  
18          cable components; and

19          (5) shall take appropriate actions to ensure  
20          timely and cost-effective development of the Space  
21          Launch System and the multi-purpose crew vehicle,  
22          including the use of a procurement approach that in-  
23          corporates adequate and effective oversight, the fa-  
24          cilitation of contractor efficiencies, and the stream-  
25          lining of contract and procurement requirements.

1 **SEC. 305. NASA LAUNCH SUPPORT AND INFRASTRUCTURE**  
2 **MODERNIZATION PROGRAM.**

3 (a) IN GENERAL.—The Administrator shall carry out  
4 a program the primary purpose of which is to prepare in-  
5 frastructure at the Kennedy Space Center that is needed  
6 to enable processing and launch of the Space Launch Sys-  
7 tem. Vehicle interfaces and other ground processing and  
8 payload integration areas should be simplified to minimize  
9 overall costs, enhance safety, and complement the purpose  
10 of this section.

11 (b) ELEMENTS.—The program required by this sec-  
12 tion shall include—

13 (1) investments to improve civil and national  
14 security operations at the Kennedy Space Center, to  
15 enhance the overall capabilities of the Center, and to  
16 reduce the long term cost of operations and mainte-  
17 nance;

18 (2) measures to provide multi-vehicle support,  
19 improvements in payload processing, and partnering  
20 at the Kennedy Space Center; and

21 (3) such other measures, including investments  
22 to improve launch infrastructure at NASA flight fa-  
23 cilities scheduled to launch cargo to the ISS under  
24 the commercial orbital transportation services pro-  
25 gram as the Administrator may consider appro-  
26 priate.



1 (c) REPORT ON NASA LAUNCH SUPPORT AND IN-  
2 FRASTRUCTURE MODERNIZATION PROGRAM.—

3 (1) REPORT REQUIRED.—Not later than 120  
4 days after the date of the enactment of this Act, the  
5 Administrator shall submit to the appropriate com-  
6 mittees of Congress a report on the plan for the im-  
7 plementation of the NASA launch support and infra-  
8 structure modernization program.

9 (2) ELEMENTS.—The report required by this  
10 subsection shall include—

11 (A) a description of the ground infrastruc-  
12 ture plan tied to the Space Launch System and  
13 potential ground investment activities at other  
14 NASA centers related to supporting the devel-  
15 opment of the Space Launch System;

16 (B) a description of proposed initiatives in-  
17 tended to be conducted jointly or in cooperation  
18 with Cape Canaveral Air Force Station, Flor-  
19 ida, or other installations or components of the  
20 United States Government; and

21 (C) a description of plans to use funds au-  
22 thorized to be appropriated by this Act to im-  
23 prove non-NASA facilities, which plans shall in-  
24 clude a business plan outlining the nature and  
25 scope of investments planned by other parties.

1 **SEC. 306. REPORT ON EFFECTS OF TRANSITION TO SPACE**  
2 **LAUNCH SYSTEM ON THE SOLID AND LIQUID**  
3 **ROCKET MOTOR INDUSTRIAL BASES.**

4 (a) **REPORT REQUIRED.**—Not later than 120 days  
5 after the date of the enactment of this Act, the Adminis-  
6 trator shall submit to Congress a report setting forth an  
7 assessment, prepared by the Administrator, in consulta-  
8 tion with the Secretary of Defense and the Secretary of  
9 Commerce, of the effects of the retirement of the Space  
10 Shuttle, and of the transition to the Space Launch System  
11 developed pursuant to section 302, on the solid rocket  
12 motor industrial base and the liquid rocket motor indus-  
13 trial base in the United States.

14 (b) **MATTERS TO BE ADDRESSED.**—In preparing the  
15 assessment required by subsection (a), the Administrator  
16 shall address the following:

17 (1) The effects of efficiencies and efforts to  
18 stream-line the industrial bases referred to in sub-  
19 section (a) for support of civil, military, and com-  
20 mercial users.

21 (2) The extent to which the United States is re-  
22 liant on non-United States systems, including for-  
23 eign rocket motors and foreign launch vehicles.

24 (3) Such other matters as the Administrator, in  
25 consultation with the Secretary of Defense and the  
26 Secretary of Commerce, may consider appropriate.

1 **SEC. 307. SENSE OF CONGRESS ON OTHER TECHNOLOGY**  
2 **AND ROBOTIC ELEMENTS IN HUMAN SPACE**  
3 **FLIGHT AND EXPLORATION.**

4 It is the sense of Congress that a balance is needed  
5 in human space flight between using and building upon  
6 existing capabilities and investing in and enabling new ca-  
7 pabilities. Technology development provides the potential  
8 to develop an increased ability to operate and extend  
9 human presence in space, while at the same time enhance  
10 the nation's economic development and aid in addressing  
11 challenges here on Earth. Additionally, the establishment  
12 of in-space capabilities, use of space resources, and the  
13 ability to repair and reuse systems in space can contribute  
14 to the overall goals of extending human presence in space  
15 in an international manner, consistent with section  
16 301(a).

17 **SEC. 308. DEVELOPMENT OF TECHNOLOGIES AND IN-SPACE**  
18 **CAPABILITIES FOR BEYOND NEAR-EARTH**  
19 **SPACE MISSIONS.**

20 (a) DEVELOPMENT AUTHORIZED.—The Adminis-  
21 trator may initiate activities to develop the following:

22 (1) Technologies identified as necessary ele-  
23 ments of missions beyond low-Earth orbit.

24 (2) In-space capabilities such as refueling and  
25 storage technology, orbital transfer stages, innova-  
26 tive in-space propulsion technology, communications,

1 and data management that facilitate a broad range  
2 of users (including military and commercial) and ap-  
3 plications defining the architecture and design of  
4 such missions.

5 (3) Spacesuit development and associated life  
6 support technology.

7 (4) Flagship missions.

8 (b) INVESTMENTS.—In developing technologies and  
9 capabilities under subsection (a), the Administrator may  
10 make investments—

11 (1) in space technologies such as advanced pro-  
12 pulsion, propellant depots, in situ resource utiliza-  
13 tion, and robotic payloads or capabilities that enable  
14 human missions beyond low-Earth orbit ultimately  
15 leading to Mars;

16 (2) in a space-based transfer vehicle including  
17 these technologies with an ability to conduct space-  
18 based operations that provide capabilities—

19 (A) to integrate with the Space Launch  
20 System and other space-based systems;

21 (B) to provide opportunities for in-space  
22 servicing of and delivery to multiple space-based  
23 platforms; and

1 (C) to facilitate international efforts to ex-  
2 pand human presence to deep space destina-  
3 tions;

4 (3) in advanced life support technologies and  
5 capabilities;

6 (4) in technologies and capabilities relating to  
7 in-space power, propulsion, and energy systems;

8 (5) in technologies and capabilities relating to  
9 in-space propellant transfer and storage;

10 (6) in technologies and capabilities relating to  
11 in situ resource utilization; and

12 (7) in expanded research to understand the  
13 greatest biological impediments to human deep space  
14 missions, especially the radiation challenge.

15 (c) UTILIZATION OF ISS AS TESTBED.—The Admin-  
16 istrator may utilize the ISS as a testbed for any tech-  
17 nology or capability developed under subsection (a) in a  
18 manner consistent with the provisions of this Act.

19 (d) COORDINATION.—The Administrator shall coordi-  
20 nate development of technologies and capabilities under  
21 this section through an overall agency technology ap-  
22 proach, as authorized by section 905 of this Act.

23 **SEC. 309. REPORT REQUIREMENT.**

24 Within 90 days after the date of enactment of this  
25 Act, or upon completion of reference designs for the Space

1 Launch System and Multi-purpose Crew Vehicle author-  
2 ized by this Act, whichever occurs first, the Administrator  
3 shall provide a detailed report to the appropriate commit-  
4 tees of Congress that provides an overall description of  
5 the reference vehicle design, the assumptions, description,  
6 data, and analysis of the systems trades and resolution  
7 process, justification of trade decisions, the design factors  
8 which implement the essential system and vehicle capa-  
9 bility requirements established by this Act, the explanation  
10 and justification of any deviations from those require-  
11 ments, the plan for utilization of existing contracts, civil  
12 service and contract workforce, supporting infrastructure  
13 utilization and modifications, and procurement strategy to  
14 expedite development activities through modification of ex-  
15 isting contract vehicles, and the schedule of design and  
16 development milestones and related schedules leading to  
17 the accomplishment of operational goals established by  
18 this Act. The Administrator shall provide an update of this  
19 report as part of the President's annual Budget Request.

1 **TITLE IV—DEVELOPMENT AND**  
2 **USE OF COMMERCIAL CREW**  
3 **AND CARGO TRANSPORTATION**  
4 **CAPABILITIES**

5 **SEC. 401. COMMERCIAL CARGO DEVELOPMENT PROGRAM.**

6 The Administrator shall continue to support the ex-  
7 isting Commercial Orbital Transportation Services pro-  
8 gram, aimed at enabling the commercial space industry  
9 in support of NASA to develop reliable means of launching  
10 cargo and supplies to the ISS throughout the duration of  
11 the facility's operation. The Administrator may apply  
12 funds towards the reduction of risk to the timely start of  
13 these services, specifically—

- 14 (1) efforts to conduct a flight test;
- 15 (2) accelerate development; and
- 16 (3) develop the ground infrastructure needed  
17 for commercial cargo capability.

18 **SEC. 402. COMMERCIAL CREW DEVELOPMENT PROGRAM.**

19 (a) CONTINUATION OF PROGRAM DURING FISCAL  
20 YEAR 2011.—The Administrator shall continue, and may  
21 expand the number of participants and the activities of,  
22 the Commercial Crew Development (CCDEV) program in  
23 fiscal year 2011, subject to the provisions of this title.

24 (b) CONTINUATION OF ACTIVITIES AND AGREE-  
25 MENTS OF FISCAL YEAR 2010.—In carrying out sub-

1 section (a), the Administrator may continue or expand ac-  
2 tivities and agreements initiated in fiscal year 2010 that  
3 reduce risk, develop technologies, and lead to other ad-  
4 vancements that will help determine the most effective and  
5 efficient means of advancing the development of commer-  
6 cial crew services.

7 **SEC. 403. REQUIREMENTS APPLICABLE TO DEVELOPMENT**  
8 **OF COMMERCIAL CREW TRANSPORTATION**  
9 **CAPABILITIES AND SERVICES.**

10 (a) **FY 2011 CONTRACTS AND PROCUREMENT**  
11 **AGREEMENTS.—**

12 (1) **IN GENERAL.—**Except as provided in para-  
13 graph (2), the Administrator may not execute a con-  
14 tract or procurement agreement with respect to fol-  
15 low-on commercial crew services during fiscal year  
16 2011.

17 (2) **EXCEPTION.—**Notwithstanding paragraph  
18 (1), the Administrator may execute a contract or  
19 procurement agreement with respect to follow-on  
20 commercial crew services during fiscal year 2011  
21 if—

22 (A) the requirements of paragraphs (1),  
23 (2), and (3) of subsection (b) are met; and

24 (B) the total amount involved for all such  
25 contracts and procurement agreements executed



1           during fiscal year 2011 does not exceed  
2           \$50,000,000 for fiscal year 2011.

3           (b) SUPPORT.—The Administrator may, beginning in  
4 fiscal year 2012 through the duration of the program, sup-  
5 port follow-on commercially-developed crew transportation  
6 systems dependent upon the completion of each of the fol-  
7 lowing:

8           (1) HUMAN RATING REQUIREMENTS.—Not later  
9 than 60 days after the date of the enactment of this  
10 Act, the Administrator shall develop and make avail-  
11 able to the public detailed human rating processes  
12 and requirements to guide the design of commer-  
13 cially-developed crew transportation capabilities,  
14 which requirements shall be at least equivalent to  
15 proven requirements for crew transportation in use  
16 as of the date of the enactment of this Act.

17           (2) COMMERCIAL MARKET ASSESSMENT.—Not  
18 later than 180 days after the date of the enactment  
19 of this Act, the Administrator shall submit to the  
20 appropriate committees of Congress an assessment,  
21 conducted, in coordination with the Federal Aviation  
22 Administration’s Office of Commercial Space Trans-  
23 portation, for purposes of this paragraph, of the po-  
24 tential non-Government market for commercially-de-  
25 veloped crew and cargo transportation systems and

1 capabilities, including an assessment of the activities  
2 associated with potential private sector utilization of  
3 the ISS research and technology development capa-  
4 bilities and other potential activities in low-Earth  
5 orbit.

6 (3) PROCUREMENT SYSTEM REVIEW.—The Ad-  
7 ministrator shall review current Government pro-  
8 curement and acquisition practices and processes, in-  
9 cluding agreement authorities under the National  
10 Aeronautics and Space Act of 1958, to determine  
11 the most cost-effective means of procuring commer-  
12 cial crew transportation capabilities and related serv-  
13 ices in a manner that ensures appropriate account-  
14 ability, transparency, and maximum efficiency in the  
15 procurement of such capabilities and services, which  
16 review shall include an identification of proposed  
17 measures to address risk management and means of  
18 indemnification of commercial providers of such ca-  
19 pabilities and services, and measures for quality con-  
20 trol, safety oversight, and the application of Federal  
21 oversight processes within the jurisdiction of other  
22 Federal agencies. A description of the proposed pro-  
23 curement process and justification of the proposed  
24 procurement for its selection shall be included in any  
25 proposed initiation of procurement activity for com-

1       mercially-developed crew transportation capabilities  
2       and services and shall be subject to review by the  
3       appropriate committees of Congress before the initi-  
4       ation of any competitive process to procure such ca-  
5       pabilities or services. In support of the review by  
6       such committees, the Comptroller General shall un-  
7       dertake an assessment of the proposed procurement  
8       process and provide a report to the appropriate com-  
9       mittees of Congress within 90 days after the date on  
10      which the Administrator provides the description  
11      and justification to such committees.

12               (4) USE OF GOVERNMENT-SUPPLIED CAPABILI-  
13      TIES AND INFRASTRUCTURE.—In evaluating any  
14      proposed development activity for commercially-de-  
15      veloped crew or cargo launch capabilities, the Ad-  
16      ministrator shall identify the anticipated contribu-  
17      tion of government personnel, expertise, tech-  
18      nologies, and infrastructure to be utilized in support  
19      of design, development, or operations of such capa-  
20      bilities. This assessment shall include a clear delin-  
21      eation of the full requirements for the commercial  
22      crew service (including the contingency for crew res-  
23      cue). The Administrator shall include details and as-  
24      sociated costs of such support as part of any pro-  
25      posed development initiative for the procurement of

1 commercially-developed crew or cargo launch capa-  
2 bilities or services.

3 (5) FLIGHT DEMONSTRATION AND READINESS  
4 REQUIREMENTS.—The Administrator shall establish  
5 appropriate milestones and minimum performance  
6 objectives to be achieved before authority is granted  
7 to proceed to the procurement of commercially-devel-  
8 oped crew transportation capabilities or systems.  
9 The guidelines shall include a procedure to provide  
10 independent assurance of flight safety and flight  
11 readiness before the authorization of United States  
12 government personnel to participate as crew onboard  
13 any commercial launch vehicle developed pursuant to  
14 this section.

15 (6) COMMERCIAL CREW RESCUE CAPABILI-  
16 TIES.—The provision of a commercial capability to  
17 provide ISS crew services shall include crew rescue  
18 requirements, and shall be undertaken through the  
19 procurement process initiated in conformance with  
20 this section. In the event such development is initi-  
21 ated, the Administrator shall make available any rel-  
22 evant government-owned intellectual property deriv-  
23 ing from the development of a multi-purpose crew  
24 vehicle authorized by this Act to commercial entities  
25 involved with such crew rescue capability develop-

1       ment which shall be relevant to the design of a crew  
2       rescue capability. In addition, the Administrator  
3       shall seek to ensure that contracts for development  
4       of the multi-purpose crew vehicle contain provisions  
5       for the licensing of relevant intellectual property to  
6       participating commercial providers of any crew res-  
7       cue capability development undertaken pursuant to  
8       this section. If one or more contractors involved with  
9       development of the multi-purpose crew vehicle seek  
10      to compete in development of a commercial crew  
11      service with crew rescue capability, separate legisla-  
12      tive authority must be enacted to enable the Admin-  
13      istrator to provide funding for any modifications of  
14      the multi-purpose crew vehicle necessary to fulfill  
15      the ISS crew rescue function.

16 **SEC. 404. REPORT ON INTERNATIONAL SPACE STATION**  
17                   **CARGO RETURN CAPABILITY.**

18       Not later than 120 days after the date of the enact-  
19      ment of this Act, the Administrator shall submit to the  
20      appropriate committees of Congress a report on potential  
21      alternative commercially-developed means for the capa-  
22      bility for a soft-landing return on land from the ISS of—  
23                   (1) research samples or other derivative mate-  
24      rials; and

1           (2) small to mid-sized (up to 1,000 kilograms)  
2           equipment for return and analysis, or for refurbish-  
3           ment and redelivery, to the ISS.

4 **TITLE V—CONTINUATION, SUP-**  
5 **PORT, AND EVOLUTION OF**  
6 **THE INTERNATIONAL SPACE**  
7 **STATION**

8 **SEC. 501. CONTINUATION OF THE INTERNATIONAL SPACE**  
9 **STATION THROUGH 2020.**

10           (a) **POLICY OF THE UNITED STATES.**—It shall be the  
11 policy of the United States, in consultation with its inter-  
12 national partners in the ISS program, to support full and  
13 complete utilization of the ISS through at least 2020.

14           (b) **NASA ACTIONS.**—In furtherance of the policy set  
15 forth in subsection (a), NASA shall pursue international,  
16 commercial, and intragovernmental means to maximize  
17 ISS logistics supply, maintenance, and operational capa-  
18 bilities, reduce risks to ISS systems sustainability, and off-  
19 set and minimize United States operations costs relating  
20 to the ISS.

21 **SEC. 502. MAXIMUM UTILIZATION OF THE INTERNATIONAL**  
22 **SPACE STATION.**

23           (a) **IN GENERAL.**—With assembly of the ISS com-  
24 plete, NASA shall take steps to maximize the productivity  
25 and use of the ISS with respect to scientific and techno-

1 logical research and development, advancement of space  
2 exploration, and international collaboration.

3 (b) NASA ACTIONS.—In carrying out subsection (a),  
4 NASA shall, at a minimum, undertake the following:

5 (1) INNOVATIVE USE OF U.S. SEGMENT.—The  
6 United States segment of the ISS, which has been  
7 designated as a National Laboratory, shall be devel-  
8 oped, managed and utilized in a manner that en-  
9 ables the effective and innovative use of such facility,  
10 as provided in section 504.

11 (2) INTERNATIONAL COOPERATION.—The ISS  
12 shall continue to be utilized as a key component of  
13 international efforts to build missions and capabili-  
14 ties that further the development of a human pres-  
15 ence beyond near-Earth space and advance United  
16 States security and economic goals. The Adminis-  
17 trator shall actively seek ways to encourage and en-  
18 able the use of ISS capabilities to support these ef-  
19 forts.

20 (3) DOMESTIC COLLABORATION.—The oper-  
21 ations, management, and utilization of the ISS shall  
22 be conducted in a manner that provides opportuni-  
23 ties for collaboration with other research programs  
24 and objectives of the United States Government in

1 cooperation with commercial suppliers, users, and  
2 developers.

3 **SEC. 503. MAINTENANCE OF THE UNITED STATES SEGMENT**  
4 **AND ASSURANCE OF CONTINUED OPER-**  
5 **ATIONS OF THE INTERNATIONAL SPACE STA-**  
6 **TION.**

7 (a) IN GENERAL.—The Administrator shall take all  
8 actions necessary to ensure the safe and effective oper-  
9 ation, maintenance, and maximum utilization of the  
10 United States segment of the ISS through at least Sep-  
11 tember 30, 2020.

12 (b) VEHICLE AND COMPONENT REVIEW.—

13 (1) IN GENERAL.—In carrying out subsection  
14 (a), the Administrator shall, as soon as is prac-  
15 ticable after the date of the enactment of this Act,  
16 carry out a comprehensive assessment of the essen-  
17 tial modules, operational systems and components,  
18 structural elements, and permanent scientific equip-  
19 ment on board or planned for delivery and installa-  
20 tion aboard the ISS, including both United States  
21 and international partner elements, for purposes of  
22 identifying the spare or replacement modules, sys-  
23 tems and components, elements, and equipment that  
24 are required to ensure complete, effective, and safe



1 functioning and full scientific utilization of the ISS  
2 through September 30, 2020.

3 (2) DATA.—In carrying out the assessment, the  
4 Administrator shall assemble any existing data, and  
5 provide for the development of any data or analysis  
6 not currently available, that is necessary for pur-  
7 poses of the assessment.

8 (c) REPORTS.—

9 (1) REPORT ON ASSESSMENT.—

10 (A) REPORT REQUIRED.—Not later than  
11 90 days after the date of the enactment of this  
12 Act, the Administrator shall submit to the ap-  
13 propriate committees of Congress a report on  
14 the assessment required by subsection (b).

15 (B) ELEMENTS.—The report required by  
16 this paragraph shall include, at minimum, the  
17 following:

18 (i) A description of the spare or re-  
19 placement modules, systems and compo-  
20 nents, elements, and equipment identified  
21 pursuant to the assessment that are cur-  
22 rently produced, in inventory, or on order,  
23 a description of the state of their readi-  
24 ness, and a schedule for their delivery to  
25 the ISS (including the planned transpor-

1           tation means for such delivery), including  
2           for each such module, system or compo-  
3           nent, element, or equipment a description  
4           of—

5                       (I) its specifications, including  
6                       size, weight, and necessary configura-  
7                       tion for launch and delivery to the  
8                       ISS;

9                       (II) its function;

10                      (III) its location; and

11                      (IV) its criticality for ISS system  
12                      integrity.

13           (ii) A description of the spare or re-  
14           placement modules, systems and compo-  
15           nents, elements, and equipment identified  
16           pursuant to the assessment that are not  
17           currently produced, in inventory, or on  
18           order, including for each such module, sys-  
19           tem or component, element, or equipment  
20           a description of—

21                      (I) its specifications, including  
22                      size, weight, and necessary configura-  
23                      tion for launch and delivery to the  
24                      ISS;

25                      (II) its function;

1 (III) its location;  
2 (IV) its criticality for ISS system  
3 integrity; and  
4 (V) the anticipated cost and  
5 schedule for its design, procurement,  
6 manufacture, and delivery to the ISS.

7 (iii) A detailed summary of the deliv-  
8 ery schedule and associated delivery vehicle  
9 requirements necessary to transport all  
10 spare and replacement elements considered  
11 essential for the ongoing and sustained  
12 functionality of all critical systems of the  
13 ISS, both in and of themselves and as an  
14 element of an integrated, mutually depend-  
15 ent essential capability, including an as-  
16 sessment of the current schedule for deliv-  
17 ery, the availability of delivery vehicles to  
18 meet that schedule, and the likelihood of  
19 meeting that schedule through such vehi-  
20 cles.

21 (2) GAO REPORT.—

22 (A) REPORT REQUIRED.—Not later than  
23 90 days after the submittal to Congress under  
24 paragraph (1) of the assessment required by  
25 subsection (b), the Comptroller General of the

1 United States shall submit to the appropriate  
2 committees of Congress a report on the assess-  
3 ment. The report shall set forth an evaluation  
4 of the assessment by the Comptroller General,  
5 including an evaluation of the accuracy and  
6 level of confidence in the findings of the assess-  
7 ment.

8 (B) COOPERATION WITH GAO.—The Ad-  
9 ministrator shall provide for the monitoring and  
10 participation of the Comptroller General in the  
11 assessment in a manner that permits the Comp-  
12 troller General to prepare and submit the re-  
13 port required by subparagraph (A).

14 (d) UTILIZATION OF RESEARCH FACILITIES AND CA-  
15 PABILITIES.—Utilization of research facilities and capa-  
16 bilities aboard the ISS (other than exploration-related re-  
17 search and technology development facilities and capabili-  
18 ties, and associated ground support and logistics), shall  
19 be planned, managed, and supported as provided in sec-  
20 tion 504. Exploration-related research and technology de-  
21 velopment facilities, capabilities, and associated ground  
22 support and logistics shall be planned, managed, and sup-  
23 ported by the appropriate NASA organizations and offi-  
24 cials in a manner that does not interfere with other activi-  
25 ties under section 504.

1 (e) SPACE SHUTTLE MISSION TO ISS.—

2 (1) SPACE SHUTTLE MISSION.—The Adminis-  
3 trator shall fly the Launch-On-Need Shuttle mission  
4 currently designated in the Shuttle Flight Manifest  
5 dated February 28, 2010, to the ISS in fiscal year  
6 2011, but no earlier than June 1, 2011, unless re-  
7 quired earlier by an operations contingency, and  
8 pending the results of the assessment required by  
9 paragraph (2) and the determination under para-  
10 graph (3)(A).

11 (2) ASSESSMENT OF SAFE MEANS OF RE-  
12 TURN.—The Administrator shall provide for an as-  
13 sessment by the NASA Engineering and Safety Cen-  
14 ter of the procedures and plans developed to ensure  
15 the safety of the Space Shuttle crew, and alternative  
16 means of return, in the event the Space Shuttle is  
17 damaged or otherwise unable to return safely to  
18 Earth.

19 (3) SCHEDULE AND PAYLOAD.—The determina-  
20 tion of the schedule and payload for the mission au-  
21 thorized by paragraph (1) shall take into account  
22 the following:

23 (A) The supply and logistics delivery re-  
24 quirements of the ISS.

1 (B) The findings of the study required by  
2 paragraph (2).

3 (4) FUNDS.—Amounts authorized to be appro-  
4 priated by section 101(2)(B) shall be available for  
5 the mission authorized by paragraph (1).

6 (f) SPACE SHUTTLE MANIFEST FLIGHT ASSUR-  
7 ANCE.—

8 (1) IN GENERAL.—The Administrator shall  
9 take all actions necessary to preserve Space Shuttle  
10 launch capability through fiscal year 2011 in a man-  
11 ner that enables the launch, at a minimum, of mis-  
12 sions and primary payloads in the Shuttle flight  
13 manifest as of February 28, 2010.

14 (2) CONTINUATION OF CONTRACTOR SUP-  
15 PORT.—The Administrator may not terminate any  
16 contract that provides the system transitions nec-  
17 essary for shuttle-derived hardware to be used on ei-  
18 ther the multi-purpose crew vehicle described in sec-  
19 tion 303 or the Space Launch System described in  
20 section 302.

21 **SEC. 504. MANAGEMENT OF THE ISS NATIONAL LABORA-**  
22 **TORY.**

23 (a) COOPERATIVE AGREEMENT WITH NOT-FOR  
24 PROFIT ENTITY FOR MANAGEMENT OF NATIONAL LAB-  
25 ORATORY.—

1           (1) IN GENERAL.—The Administrator shall pro-  
2       vide initial financial assistance and enter into a co-  
3       operative agreement with an appropriate organiza-  
4       tion that is exempt from taxation under section  
5       501(c)(3) of the Internal Revenue Code of 1986 to  
6       manage the activities of the ISS national laboratory  
7       in accordance with this section.

8           (2) QUALIFICATIONS.—The organization with  
9       which the Administrator enters into the cooperative  
10      agreement shall develop the capabilities to imple-  
11      ment research and development projects utilizing the  
12      ISS national laboratory and to otherwise manage the  
13      activities of the ISS national laboratory.

14          (3) PROHIBITION ON OTHER ACTIVITIES.—The  
15      cooperative agreement shall require the organization  
16      entering into the agreement to engage exclusively in  
17      activities relating to the management of the ISS na-  
18      tional laboratory and activities that promote its long  
19      term research and development mission as required  
20      by this section, without any other organizational ob-  
21      jectives or responsibilities on behalf of the organiza-  
22      tion or any parent organization or other entity.

23      (b) NASA LIAISON.—

24          (1) DESIGNATION.—The Administrator shall  
25      designate an official or employee of the Space Oper-

1        ations Mission Directorate of NASA to act as liaison  
2        between NASA and the organization with which the  
3        Administrator enters into a cooperative agreement  
4        under subsection (a) with regard to the management  
5        of the ISS national laboratory.

6            (2) CONSULTATION WITH LIAISON.—The coop-  
7        erative agreement shall require the organization en-  
8        tering into the agreement to carry out its respon-  
9        sibilities under the agreement in cooperation and  
10       consultation with the official or employee designated  
11       under paragraph (1).

12        (c) PLANNING AND COORDINATION OF ISS NATIONAL  
13       LABORATORY RESEARCH ACTIVITIES.—The Adminis-  
14       trator shall provide initial financial assistance to the orga-  
15       nization with which the Administrator enters into a coop-  
16       erative agreement under subsection (a), in order for the  
17       organization to initiate the following:

18            (1) Planning and coordination of the ISS na-  
19       tional laboratory research activities.

20            (2) Development and implementation of guide-  
21       lines, selection criteria, and flight support require-  
22       ments for non-NASA scientific utilization of ISS re-  
23       search capabilities and facilities available in United  
24       States-owned modules of the ISS or in partner-



1 owned facilities of the ISS allocated to United States  
2 utilization by international agreement.

3 (3) Interaction with and integration of the  
4 International Space Station National Laboratory  
5 Advisory Committee established under section 602 of  
6 the National Aeronautics and Space Administration  
7 Authorization Act of 2008 (42 U.S.C. 17752) with  
8 the governance of the organization, and review rec-  
9 ommendations provided by that Committee regard-  
10 ing agreements with non-NASA departments and  
11 agencies of the United States Government, academic  
12 institutions and consortia, and commercial entities  
13 leading to the utilization of the ISS national labora-  
14 tory facilities.

15 (4) Coordination of transportation requirements  
16 in support of the ISS national laboratory research  
17 and development objectives, including provision for  
18 delivery of instruments, logistics support, and re-  
19 lated experiment materials, and provision for return  
20 to Earth of collected samples, materials, and sci-  
21 entific instruments in need of replacement or up-  
22 grade.

23 (5) Cooperation with NASA, other departments  
24 and agencies of the United States Government, the  
25 States, and commercial entities in ensuring the en-

1 hancement and sustained operations of non-explo-  
2 ration-related research payload ground support fa-  
3 cilities for the ISS, including the Space Life  
4 Sciences Laboratory, the Space Station Processing  
5 Facility and Payload Operations Integration Center.

6 (6) Development and implementation of sci-  
7 entific outreach and education activities designed to  
8 ensure effective utilization of ISS research capabili-  
9 ties including the conduct of scientific assemblies,  
10 conferences, and other fora for the presentation of  
11 research findings, methods, and mechanisms for the  
12 dissemination of non-restricted research findings and  
13 the development of educational programs, course  
14 supplements, interaction with educational programs  
15 at all grade levels, including student-focused re-  
16 search opportunities for conduct of research in the  
17 ISS national laboratory facilities.

18 (7) Such other matters relating to the utiliza-  
19 tion of the ISS national laboratory facilities for re-  
20 search and development as the Administrator may  
21 consider appropriate.

22 (d) RESEARCH CAPACITY ALLOCATION AND INTE-  
23 GRATION OF RESEARCH PAYLOADS.—

24 (1) ALLOCATION OF ISS RESEARCH CAPAC-  
25 ITY.—As soon as practicable after the date of the

1 enactment of this Act, but not later than October 1,  
2 2011, ISS national laboratory managed experiments  
3 shall be guaranteed access to, and utilization of, not  
4 less than 50 percent of the United States research  
5 capacity allocation, including power, cold stowage,  
6 and requisite crew time onboard the ISS through  
7 September 30, 2020. Access to the ISS research ca-  
8 pacity includes provision for the adequate upmass  
9 and downmass capabilities to utilize the ISS re-  
10 search capacity, as available. The Administrator may  
11 allocate additional capacity to the ISS national lab-  
12 oratory should such capacity be in excess of NASA  
13 research requirements.

14 (2) *ADDITIONAL RESEARCH CAPABILITIES.*—If  
15 any NASA research plan is determined to require re-  
16 search capacity onboard the ISS beyond the percent-  
17 age allocated under paragraph (1), such research  
18 plan shall be prepared in the form of a requested re-  
19 search opportunity to be submitted to the process es-  
20 tablished under this section for the consideration of  
21 proposed research within the capacity allocated to  
22 the ISS national laboratory. A proposal for such a  
23 research plan may include the establishment of part-  
24 nerships with non-NASA institutions eligible to pro-  
25 pose research to be conducted within the ISS na-

1 tional laboratory capacity. Until September 30,  
2 2020, the official or employee designated under sub-  
3 section (b) may grant an exception to this require-  
4 ment in the case of a proposed experiment consid-  
5 ered essential for purposes of preparing for explo-  
6 ration beyond low-Earth orbit, as determined by  
7 joint agreement between the organization with which  
8 the Administrator enters into a cooperative agree-  
9 ment under subsection (a) and the official or em-  
10 ployee designated under subsection (b).

11 (3) RESEARCH PRIORITIES AND ENHANCED CA-  
12 PACITY.—The organization with which the Adminis-  
13 trator enters into the cooperative agreement shall  
14 consider recommendations of the National Acad-  
15 emies Decadal Survey on Biological and Physical  
16 Sciences in Space in establishing research priorities  
17 and in developing proposed enhancements of re-  
18 search capacity and opportunities for the ISS na-  
19 tional laboratory.

20 (4) RESPONSIBILITY FOR RESEARCH PAY-  
21 LOAD.—NASA shall retain its roles and responsibil-  
22 ities in providing research payload physical, analyt-  
23 ical, and operations integration during pre-flight,  
24 post-flight, transportation, and orbital phases essen-  
25 tial to ensure safe and effective flight readiness and

1 vehicle integration of research activities approved  
2 and prioritized by the organization with which the  
3 Administrator enters into the cooperative agreement  
4 and the official or employee designated under sub-  
5 section (b).

6 **TITLE VI—SPACE SHUTTLE**  
7 **RETIREMENT AND TRANSITION**

8 **SEC. 601. SENSE OF CONGRESS ON THE SPACE SHUTTLE**  
9 **PROGRAM.**

10 (a) FINDINGS.—Congress makes the following find-  
11 ings:

12 (1) The Space Shuttle program represents a  
13 national asset consisting of critical skills and capa-  
14 bilities, including the ability to lift large payloads  
15 into space and return them to Earth.

16 (2) The Space Shuttle has carried more than  
17 355 people from 16 nations into space.

18 (3) The Space Shuttle has projected the best of  
19 American values around the world, and Space Shut-  
20 tle crews have sparked the imagination and dreams  
21 of the world's youth and young at heart.

22 (b) SENSE OF CONGRESS.—It is the sense of Con-  
23 gress that—

24 (1) it is essential that the retirement of the  
25 Space Shuttle and the transition to new human

1 space flight capabilities be done in a manner that  
2 builds upon the legacy of this national asset; and

3 (2) it is imperative for the United States to re-  
4 tain the skills and the industrial capability to pro-  
5 vide a follow-on Space Launch System that is pri-  
6 marily designed for missions beyond near-Earth  
7 space, while offering some potential for supplanting  
8 shuttle delivery capabilities to low-Earth orbit, par-  
9 ticularly in support of ISS requirements, if nec-  
10 essary.

11 **SEC. 602. RETIREMENT OF SPACE SHUTTLE ORBITERS AND**  
12 **TRANSITION OF SPACE SHUTTLE PROGRAM.**

13 (a) IN GENERAL.—The Administrator shall retire the  
14 Space Shuttle orbiters pursuant to a schedule established  
15 by the Administrator and in a manner consistent with pro-  
16 visions of this Act regarding potential requirements for  
17 contingency utilization of Space Shuttle orbiters for ISS  
18 requirements.

19 (b) UTILIZATION OF WORKFORCE AND ASSETS IN  
20 FOLLOW-ON SPACE LAUNCH SYSTEM.—

21 (1) UTILIZATION OF VEHICLE ASSETS.—In car-  
22 rying out subsection (a), the Administrator shall, to  
23 the maximum extent practicable, utilize workforce,  
24 assets, and infrastructure of the Space Shuttle pro-  
25 gram in efforts relating to the initiation of a follow-

1 on Space Launch System developed pursuant to sec-  
2 tion 302 of this Act.

3 (2) OTHER ASSETS.—With respect to the work-  
4 force, assets, and infrastructure not utilized as de-  
5 scribed in paragraph (1), the Administrator shall  
6 work closely with other departments and agencies of  
7 the Federal Government, and the private sector, to  
8 divest unneeded assets and to assist displaced work-  
9 ers with retraining and other placement efforts.  
10 Amounts authorized to be appropriated by section  
11 101(2)(B) shall be available for activities pursuant  
12 to this paragraph.

13 **SEC. 603. DISPOSITION OF ORBITER VEHICLES.**

14 (a) IN GENERAL.—Upon the termination of the  
15 Space Shuttle program as provided in section 602, the Ad-  
16 ministrator shall decommission any remaining Space  
17 Shuttle orbiter vehicles according to established safety and  
18 historic preservation procedures prior to their designation  
19 as surplus government property. The orbiter vehicles shall  
20 be made available and located for display and maintenance  
21 through a competitive procedure established pursuant to  
22 the disposition plan developed under section 613(a) of the  
23 National Aeronautics and Space Administration Author-  
24 ization Act of 2008 (42 U.S.C. 17761(a)), with priority  
25 consideration given to eligible applicants meeting all condi-

1 tions of that plan which would provide for the display and  
2 maintenance of orbiters at locations with the best potential  
3 value to the public, including where the location of the  
4 orbiters can advance educational opportunities in science,  
5 technology, engineering, and mathematics disciplines, and  
6 with an historical relationship with either the launch,  
7 flight operations, or processing of the Space Shuttle orbit-  
8 ers or the retrieval of NASA manned space vehicles, or  
9 significant contributions to human space flight. The  
10 Smithsonian Institution, which, as of the date of enact-  
11 ment of this Act, houses the Space Shuttle Enterprise,  
12 shall determine any new location for the Enterprise.

13 (b) DISPLAY AND MAINTENANCE.—The orbiter vehi-  
14 cles made available under subsection (a) shall be displayed  
15 and maintained through agreements and procedures es-  
16 tablished pursuant to section 613(a) of the National Aero-  
17 nautics and Space Administration Authorization Act of  
18 2008 (42 U.S.C. 17761(a)).

19 (c) AUTHORIZATION OF APPROPRIATIONS.—There  
20 are authorized to be appropriated to NASA such sums as  
21 may be necessary to carry out this section. The amounts  
22 authorized to be appropriated by this subsection shall be  
23 in addition to any amounts authorized to be appropriated  
24 by title I, and may be requested by the President as sup-



1 plemental requirements, if needed, in the appropriate fis-  
2 cal years.

## 3 **TITLE VII—EARTH SCIENCE**

### 4 **SEC. 701. SENSE OF CONGRESS.**

5 It is the sense of Congress that—

6 (1) Earth observations are critical to scientific  
7 understanding and monitoring of the Earth system,  
8 to protecting human health and property, to growing  
9 the economy of the United States, and to strength-  
10 ening the national security and international posture  
11 of the United States. Additionally, recognizing the  
12 number of relevant participants and activities in-  
13 volved with Earth observations within the United  
14 States Government and internationally, Congress  
15 supports the strengthening of collaboration across  
16 these areas;

17 (2) NASA plays a critical role through its abil-  
18 ity to provide data on solar output, sea level rise, at-  
19 mospheric and ocean temperature, ozone depletion,  
20 air pollution, and observation of human and environ-  
21 ment relationships;

22 (3) programs should utilize open standards con-  
23 sistent with international data-sharing principles and  
24 obtain and convert data from other government  
25 agencies, including data from the United States Ge-

1       ological Survey, and data derived from satellites op-  
2       erated by NOAA as well as from international sat-  
3       ellites are important to the study of climate science  
4       and such cooperative relationships and programs  
5       should be maintained;

6           (4) Earth-observing satellites and sustained  
7       monitoring programs will continue to play a vital  
8       role in climate science, environmental understanding,  
9       mitigation of destructive environmental impacts, and  
10      contributing to the general national welfare; and

11          (5) land remote sensing observation plays a  
12      critical role in Earth science, and the national space  
13      policy supports this role by requiring operational  
14      land remote sensing capabilities.

15 **SEC. 702. INTERAGENCY COLLABORATION IMPLEMENTA-**  
16 **TION APPROACH.**

17      The Director of OSTP shall establish a mechanism  
18      to ensure greater coordination of the research, operations,  
19      and activities relating to civilian Earth observation of  
20      those Agencies, including NASA, that have active pro-  
21      grams that either contribute directly or indirectly to these  
22      areas. This mechanism should include the development of  
23      a strategic implementation plan that is updated at least  
24      every 3 years, and includes a process for external inde-  
25      pendent advisory input. This plan should include a de-

1 description of the responsibilities of the various Agency roles  
2 in Earth observations, recommended cost-sharing and pro-  
3 curement arrangements between Agencies and other enti-  
4 ties, including international arrangements, and a plan for  
5 ensuring the provision of sustained, long term space-based  
6 climate observations. The Director shall provide a report  
7 to Congress within 90 days after the date of enactment  
8 of this Act on the implementation plan for this mecha-  
9 nism.

10 **SEC. 703. TRANSITIONING EXPERIMENTAL RESEARCH TO**  
11 **OPERATIONS.**

12 The Administrator shall coordinate with the Adminis-  
13 trator of NOAA and the Director of the United States  
14 Geological Survey to establish a formal mechanism that  
15 plans, coordinates, and supports the transitioning of  
16 NASA research findings, assets, and capabilities to NOAA  
17 operations and United States Geological Survey oper-  
18 ations. In defining this mechanism, NASA should consider  
19 the establishment of a formal or informal Interagency  
20 Transition Office. The Administrator of NASA shall pro-  
21 vide an implementation plan for this mechanism to Con-  
22 gress within 90 days after the date of enactment of this  
23 Act.

1 **SEC. 704. DECADAL SURVEY MISSIONS IMPLEMENTATION**  
2 **FOR EARTH OBSERVATION.**

3 The Administrator shall undertake to implement, as  
4 appropriate, missions identified in the National Research  
5 Council's Earth Science Decadal Survey within the scope  
6 of the funds authorized for the Earth Science Mission Di-  
7 rectorate.

8 **SEC. 705. EXPANSION OF EARTH SCIENCE APPLICATIONS.**

9 It is the sense of the Congress that the role of NASA  
10 in Earth Science applications shall be expanded with other  
11 departments and agencies of the Federal government,  
12 State and local governments, tribal governments, aca-  
13 demia, the private sector, nonprofit organizations, and  
14 international partners. NASA's Earth science data can in-  
15 creasingly aid efforts to improve the human condition and  
16 provide greater security.

17 **SEC. 706. INSTRUMENT TEST-BEDS AND VENTURE CLASS**  
18 **MISSIONS.**

19 The Administrator shall pursue innovative ways to fly  
20 instrument-level payloads for early demonstration or as  
21 co-manifested payloads. The Congress encourages the use  
22 of the ISS as an accessible platform for the conduct of  
23 such activities. Additionally, in order to address the cost  
24 and schedule challenges associated with large flight sys-  
25 tems, NASA should pursue smaller systems where prac-  
26 ticable and warranted.

1 **SEC. 707. SENSE OF CONGRESS ON NPOESS FOLLOW-ON**  
2 **PROGRAM.**

3 It is the Sense of the Congress that—

4 (1) polar orbiting satellites are vital for weather  
5 prediction, climate and environmental monitoring,  
6 national security, emergency response, and climate  
7 research;

8 (2) the National Polar Orbiting Environmental  
9 Satellite System has suffered from years of steadily  
10 rising cost estimates and schedule delays and an  
11 independent review team recommended that the Sys-  
12 tem be restructured to improve the probability of  
13 success and protect the continuity of weather and  
14 climate data;

15 (3) the Congress supports the decision made by  
16 OSTP in February, 2010, to restructure the pro-  
17 gram to minimize schedule slips and cost overruns,  
18 clarify the responsibilities and accountability of  
19 NASA, NOAA, and the Department of Defense, and  
20 retain necessary coordination across civil and de-  
21 fense weather and climate programs;

22 (4) the Administrator of NOAA and the Sec-  
23 retary of Defense should maximize the use of assets  
24 from the NPOESS program as they establish the  
25 NOAA Joint Polar Satellite System at NASA's God-

1       dard Space Flight Center, and the Department of  
2       Defense's Defense Weather Satellite System;

3               (5) the Administrator of NOAA and the Sec-  
4       retary of Defense should structure their programs in  
5       order to maintain satellite data continuity for the  
6       Nation's weather and climate requirements; and

7               (6) the Administrator of NOAA and the Sec-  
8       retary of Defense should provide immediate notifica-  
9       tion to the Congress of any impediments that may  
10      require Congressional intervention in order for the  
11      agencies to meet launch readiness dates, together  
12      with any recommended actions.

## 13       **TITLE VIII—SPACE SCIENCE**

### 14      **SEC. 801. TECHNOLOGY DEVELOPMENT.**

15       The Administrator shall ensure that the Science Mis-  
16      sion Directorate maintains a long term technology devel-  
17      opment program for space and Earth science. This effort  
18      should be coordinated with an overall Agency technology  
19      investment approach, as authorized in section 905 of this  
20      Act.

### 21      **SEC. 802. SUBORBITAL RESEARCH ACTIVITIES.**

22       (a) IN GENERAL.—The report of the National Acad-  
23      emy of Sciences, Revitalizing NASA's Suborbital Pro-  
24      gram: Advancing Science, Driving Innovation and Devel-  
25      oping Workforce, found that suborbital science missions

1 were absolutely critical to building an aerospace workforce  
2 capable of meeting the needs of current and future human  
3 and robotic space exploration.

4 (b) MANAGEMENT.—The Administrator shall des-  
5 ignate an officer or employee of the Science Mission Direc-  
6 torate to act as the responsible official for all Suborbital  
7 Research in the Science Mission Directorate. The designee  
8 shall be responsible for the development of short- and long  
9 term strategic plans for maintaining, renewing and ex-  
10 tending suborbital facilities and capabilities, monitoring  
11 progress towards goals in the plans, and be responsible  
12 for integration of suborbital activities and workforce devel-  
13 opment within the agency, thereby ensuring the long term  
14 recognition of their combined value to the directorate, to  
15 NASA, and to the Nation.

16 (c) ESTABLISHMENT OF SUBORBITAL RESEARCH  
17 PROGRAM.—The Administrator shall establish a Sub-  
18 orbital Research Program within the Science Mission Di-  
19 rectorate that shall include the use of sounding rockets,  
20 aircraft, high altitude balloons, suborbital reusable launch  
21 vehicles, and commercial launch vehicles to advance  
22 science and train the next generation of scientists and en-  
23 gineers in systems engineering and systems integration  
24 which are vital to maintaining critical skills in the aero-  
25 space workforce. The program shall integrate existing sub-

1 orbital research programs with orbital missions at the dis-  
2 cretion of the designated officer or employee and shall em-  
3 phasize the participation of undergraduate and graduate  
4 students and post-doctoral researchers when formulating  
5 announcements of opportunity.

6 (d) REPORT.—The Administrator shall report to the  
7 appropriate committees of Congress on the number and  
8 type of suborbital missions conducted in each fiscal year  
9 and the number of undergraduate and graduate students  
10 participating in the missions. The report shall be made  
11 annually for each fiscal year under this section.

12 (e) AUTHORIZATION.—There are authorized to be ap-  
13 propriated to the Administrator such sums as may be nec-  
14 essary to carry out this section.

15 **SEC. 803. OVERALL SCIENCE PORTFOLIO-SENSE OF THE**  
16 **CONGRESS.**

17 Congress reaffirms its sense that a balanced and ade-  
18 quately funded set of activities, consisting of research and  
19 analysis grants programs, technology development, small,  
20 medium, and large space missions, and suborbital research  
21 activities, contributes to a robust and productive science  
22 program and serves as a catalyst for innovation.

23 **SEC. 804. IN-SPACE SERVICING.**

24 The Administrator shall continue to take all nec-  
25 essary steps to ensure that provisions are made for in-



1 space or human servicing and repair of all future observ-  
2 atory-class scientific spacecraft intended to be deployed in  
3 Earth-orbit or at a Lagrangian point to the extent prac-  
4 ticable and appropriate. The Administrator should ensure  
5 that agency investments and future capabilities for space  
6 technology, robotics, and human space flight take the abil-  
7 ity to service and repair these spacecraft into account,  
8 where appropriate, and incorporate such capabilities into  
9 design and operational plans.

10 **SEC. 805. DECADAL RESULTS.**

11 NASA shall take into account the current decadal  
12 surveys from the National Academies' Space Studies  
13 Board when submitting the President's budget request to  
14 the Congress.

15 **SEC. 806. ON-GOING RESTORATION OF RADIOISOTOPE**  
16 **THERMOELECTRIC GENERATOR MATERIAL**  
17 **PRODUCTION.**

18 (a) FINDINGS.—The Congress finds the following:

19 (1) The United States has led the world in the  
20 scientific exploration of space for nearly 50 years.

21 (2) Missions such as Viking, Voyager, Cassini,  
22 and New Horizons have greatly expanded knowledge  
23 of our solar system and planetary characteristics  
24 and evolution.

1           (3) Radioisotope power systems are the only  
2           available power sources for deep space missions  
3           making it possible to travel to such distant destina-  
4           tions as Mars, Jupiter, Saturn, Pluto, and beyond  
5           and maintain operational control and systems viabil-  
6           ity for extended mission durations.

7           (4) Current radioisotope power systems supplies  
8           and production will not fully support NASA missions  
9           planned even in the next decade and, without a new  
10          domestic production capability, the United States  
11          will no longer have the means to explore the major-  
12          ity of the solar system by the end of this decade.

13          (5) Continuing to rely on Russia or other for-  
14          eign sources for radioisotope power system fuel pro-  
15          duction is not a secure option.

16          (6) Reestablishing domestic production will re-  
17          quire a long lead-time. Thus, meeting future space  
18          exploration mission needs requires that a restart  
19          project begin at the earliest opportunity.

20          (b) IN GENERAL.—The Administrator shall, in co-  
21          ordination with the Secretary of Energy, pursue a joint  
22          approach beginning in fiscal year 2011 towards restarting  
23          and sustaining the domestic production of radioisotope  
24          thermoelectric generator material for deep space and other  
25          science and exploration missions. Funds authorized by this

1 Act for NASA shall be made available under a reimburs-  
2 able agreement with the Department of Energy for the  
3 purpose of reestablishing facilities to produce fuel required  
4 for radioisotope thermoelectric generators to enable future  
5 missions.

6 (c) REPORT.—Within 120 days after the date of en-  
7 actment of this Act, the Administrator and the Secretary  
8 of Energy shall submit a joint report to the appropriate  
9 committees of Congress on coordinated agreements,  
10 planned implementation, and anticipated schedule, pro-  
11 duction quantities, and mission applications under this  
12 section.

13 **SEC. 807. COLLABORATION WITH ESMD AND SOMD ON**  
14 **ROBOTIC MISSIONS.**

15 The Administrator shall ensure that the Exploration  
16 Systems Mission Directorate and the Space Operations  
17 Mission Directorate coordinate with the Science Mission  
18 Directorate on an overall approach and plan for inter-  
19 agency and international collaboration on robotic missions  
20 that are NASA or internationally developed, including  
21 lunar, Lagrangian, near-Earth orbit, and Mars spacecraft,  
22 such as the International Lunar Network. Within 90 days  
23 after the date of enactment of this Act, the Administrator  
24 shall provide a plan to the appropriate committees of Con-  
25 gress for implementation of the collaborative approach re-

1 quired by this section. The Administrator may not cancel  
2 or initiate any Exploration Systems Mission Directorate  
3 or Science Mission Directorate robotic project before the  
4 plan is submitted to the appropriate committees of Con-  
5 gress.

6 **SEC. 808. NEAR-EARTH OBJECT SURVEY AND POLICY WITH**  
7 **RESPECT TO THREATS POSED.**

8 (a) **POLICY REAFFIRMATION.**—Congress reaffirms  
9 the policy set forth in section 102(g) of the National Aero-  
10 nautics and Space Act of 1958 (42 U.S.C. 2451(g)) relat-  
11 ing to surveying near-Earth asteroids and comets.

12 (b) **IMPLEMENTATION.**—The Director of the OSTP  
13 shall implement, before September 30, 2012, a policy for  
14 notifying Federal agencies and relevant emergency re-  
15 sponse institutions of an impending near-Earth object  
16 threat if near-term public safety is at risk, and assign a  
17 Federal agency or agencies to be responsible for protecting  
18 the United States and working with the international com-  
19 munity on such threats.

20 **SEC. 809. SPACE WEATHER.**

21 (a) **FINDINGS.**—The Congress finds the following:

22 (1) Space weather events pose a significant  
23 threat to modern technological systems.

24 (2) The effects of severe space weather events  
25 on the electric power grid, telecommunications and

1 entertainment satellites, airline communications dur-  
2 ing polar routes, and space-based position, naviga-  
3 tion and timing systems could have significant soci-  
4 etal, economic, national security, and health impacts.

5 (3) Earth and Space Observing satellites, such  
6 as the Advanced Composition Explorer, Geo-  
7 stationary Operational Environmental Satellites,  
8 Polar Operational Environmental Satellites, and De-  
9 fense Meteorological Satellites, provide crucial data  
10 necessary to predict space weather events.

11 (b) ACTION REQUIRED.—The Director of OSTP  
12 shall—

13 (1) improve the Nation’s ability to prepare,  
14 avoid, mitigate, respond to, and recover from poten-  
15 tially devastating impacts of space weather events;

16 (2) coordinate the operational activities of the  
17 National Space Weather Program Council members,  
18 including the NOAA Space Weather Prediction Cen-  
19 ter and the U.S. Air Force Weather Agency; and

20 (3) submit a report to the appropriate commit-  
21 tees of Congress within 180 days after the date of  
22 enactment of this Act that—

23 (A) details the current data sources, both  
24 space- and ground-based, that are necessary for  
25 space weather forecasting; and

1 (B) details the space- and ground-based  
2 systems that will be required to gather data  
3 necessary for space weather forecasting for the  
4 next 10 years.

5 **TITLE IX—AERONAUTICS AND**  
6 **SPACE TECHNOLOGY**

7 **SEC. 901. SENSE OF CONGRESS.**

8 It is the sense of Congress that—

9 (1) aeronautics research remains vital to  
10 NASA’s mission and deserves continued support;

11 (2) NASA aeronautics research should be guid-  
12 ed by, and consistent with, the National Aeronautics  
13 Research and Development Policy that guides the  
14 Nation’s aeronautics research and development ac-  
15 tivities;

16 (3) the OSTP-led National Science and Tech-  
17 nology Council Aeronautics Science and Technology  
18 subcommittee remains essential to developing and  
19 coordinating national aeronautics research and de-  
20 velopment plans and their prioritization for funding,  
21 and that it is also important that the plans include  
22 a focus on research, development, test, and evalua-  
23 tion infrastructure plans, as well as research and de-  
24 velopment goals and objectives; and

1           (4) technology research conducted by NASA as  
2           part of the larger national aeronautics effort would  
3           help to secure, sustain, and advance the leadership  
4           role of the United States in global aviation.

5 **SEC. 902. AERONAUTICS RESEARCH GOALS.**

6           The Administrator should ensure that NASA main-  
7           tains a strong aeronautics research portfolio ranging from  
8           fundamental research through systems research with spe-  
9           cific research goals, including the following:

10           (1) AIRSPACE CAPACITY.—NASA’s Aeronautics  
11           Research Mission Directorate shall address research  
12           needs of the Next Generation Air Transportation  
13           System, including the ability of the National Air-  
14           space System to handle up to 3 times the current  
15           travel demand by 2025.

16           (2) ENVIRONMENTAL SUSTAINABILITY.—The  
17           Directorate shall consider and pursue concepts to re-  
18           duce noise, emissions, and fuel consumption while  
19           maintaining high safety standards and shall pursue  
20           research related to alternative fuels.

21           (3) AVIATION SAFETY.—The Directorate shall  
22           proactively address safety challenges with new and  
23           current air vehicles and with operations in the Na-  
24           tion’s current and future air transportation system.

1 **SEC. 903. RESEARCH COLLABORATION.**

2 (a) DEPARTMENT OF DEFENSE.—The Administrator  
3 shall continue to coordinate with the Secretary of Defense,  
4 through the National Partnership for Aeronautics Testing,  
5 to develop and implement joint plans for those elements  
6 of the Nation’s research, development, testing, and engi-  
7 neering infrastructure that are of common interest and  
8 use.

9 (b) FEDERAL AVIATION ADMINISTRATION.—The Ad-  
10 ministrator shall continue to coordinate with, and work  
11 closely with, the Administrator of the Federal Aviation  
12 Administration, under the framework of the Senior Policy  
13 Council, in development of the Next Generation Air Trans-  
14 portation Program. The Administrator shall encourage the  
15 Council to explore areas for greater collaboration, includ-  
16 ing areas where NASA can help to accelerate the develop-  
17 ment and demonstration of NextGen technologies.

18 **SEC. 904. GOAL FOR AGENCY SPACE TECHNOLOGY.**

19 It is critical that NASA maintain an Agency space  
20 technology base that helps align mission directorate in-  
21 vestments and supports long term needs to complement  
22 mission-directorate funded research and support, where  
23 appropriate, multiple users, building upon its Innovative  
24 Partnerships Program and other partnering approaches.



1 **SEC. 905. IMPLEMENTATION PLAN FOR AGENCY SPACE**  
2 **TECHNOLOGY.**

3 Within 120 days after the date of enactment of this  
4 Act, NASA shall submit a plan to the appropriate commit-  
5 tees of Congress that outlines how NASA's space tech-  
6 nology program will meet the goal described in section  
7 904, including an explanation of how the plan will link  
8 to other mission-directorate technology efforts outlined in  
9 sections 608, 801, and 802 of this Act.

10 **SEC. 906. NATIONAL SPACE TECHNOLOGY POLICY.**

11 (a) IN GENERAL.—The President or the President's  
12 designee, in consultation with appropriate Federal agen-  
13 cies, shall develop a national policy to guide the space  
14 technology development programs of the United States  
15 through 2020. The policy shall include national goals for  
16 technology development and shall describe the role and re-  
17 sponsibilities of each Federal agency that will carry out  
18 the policy. In developing the policy, the President or the  
19 President's designee shall utilize external studies that have  
20 been conducted on the state of United States technology  
21 development and have suggested policies to ensure contin-  
22 ued competitiveness.

23 (b) CONTENT.—

24 (1) At a minimum, the national space tech-  
25 nology development policy shall describe for  
26 NASA—

1 (A) the priority areas of research for tech-  
2 nology investment;

3 (B) the basis on which and the process by  
4 which priorities for ensuing fiscal years will be  
5 selected;

6 (C) the facilities and personnel needed to  
7 carry out the technology development program;  
8 and

9 (D) the budget assumptions on which the  
10 policy is based, which for fiscal years 2011,  
11 2012, and 2013 shall be the authorized level for  
12 NASA's technology program authorized by this  
13 Act.

14 (2) The policy shall be based on the premise  
15 that the Federal Government has an established in-  
16 terest in conducting research and development pro-  
17 grams that help preserve the role of the United  
18 States as a global leader in space technologies and  
19 their application.

20 (3) CONSIDERATIONS.—In developing the na-  
21 tional space technology development policy, the  
22 President or the President's designee shall consider,  
23 and include a discussion in the report required by  
24 subsection (c), of the following issues:

1           (A) The extent to which NASA should  
2           focus on long term, high-risk research or more  
3           incremental technology development, and the  
4           expected impact of that decision on the United  
5           States economy.

6           (B) The extent to which NASA should ad-  
7           dress military and commercial needs.

8           (C) How NASA will coordinate its tech-  
9           nology program with other Federal agencies.

10          (D) The extent to which NASA will con-  
11          duct research in-house, fund university re-  
12          search, and collaborate on industry research  
13          and the expected impact of that mix of funding  
14          on the supply of United States workers for in-  
15          dustry.

16          (4) CONSULTATION.—In the development of the  
17          national space technology development policy, the  
18          President or the President’s designee shall consult  
19          widely with academic and industry experts and with  
20          other Federal agencies. The Administrator may  
21          enter into an arrangement with the National Acad-  
22          emy of Sciences to help develop the policy.

23          (c) REPORT.—

24                (1) POLICY.—Not later than 1 year after the  
25          date of enactment of this Act, the President shall

1 transmit a report setting forth national space tech-  
2 nology policy to the appropriate committees of Con-  
3 gress and to the Senate Committee on Appropria-  
4 tions and the House of Representatives Committee  
5 on Appropriations.

6 (2) IMPLEMENTATION.—Not later than 60 days  
7 after the President transmits the report required by  
8 paragraph (1) to the Congress, the Administrator  
9 shall transmit a report to the same committees de-  
10 scribing how NASA will carry out the policy.

11 **SEC. 907. COMMERCIAL REUSABLE SUBORBITAL RE-**  
12 **SEARCH PROGRAM.**

13 (a) IN GENERAL.—The report of the National Acad-  
14 emy of Sciences, Revitalizing NASA's Suborbital Pro-  
15 gram: Advancing Science, Driving Innovation and Devel-  
16 oping Workforce, found that suborbital science missions  
17 were absolutely critical to building an aerospace workforce  
18 capable of meeting the needs of current and future human  
19 and robotic space exploration.

20 (b) MANAGEMENT.—The Administrator shall des-  
21 ignate an officer or employee of the Space Technology  
22 Program to act as the responsible official for the Commer-  
23 cial Reusable Suborbital Research Program in the Space  
24 Technology Program. The designee shall be responsible for  
25 the development of short- and long term strategic plans

1 for maintaining, renewing and extending suborbital facili-  
2 ties and capabilities.

3 (c) ESTABLISHMENT.—The Administrator shall es-  
4 tablish a Commercial Reusable Suborbital Research Pro-  
5 gram within the Space Technology Program that shall  
6 fund the development of payloads for scientific research,  
7 technology development, and education, and shall provide  
8 flight opportunities for those payloads to microgravity en-  
9 vironments and suborbital altitudes. The Commercial Re-  
10 usable Suborbital Research Program may fund engineer-  
11 ing and integration demonstrations, proofs of concept, or  
12 educational experiments for commercial reusable vehicle  
13 flights. The program shall endeavor to work with NASA’s  
14 Mission Directorates to help achieve NASA’s research,  
15 technology, and education goals.

16 (d) REPORT.—The Administrator shall submit a re-  
17 port annually to the appropriate committees of Congress  
18 describing progress in carrying out the Commercial Reus-  
19 able Suborbital Research program, including the number  
20 and type of suborbital missions planned in each fiscal  
21 year.

22 (e) AUTHORIZATION.—There are authorized to be ap-  
23 propriated to the Administrator \$15,000,000 for each of  
24 fiscal years 2011 through 2013 to carry out this section.

1                   **TITLE X—EDUCATION**

2   **SEC. 1001. REPORT ON EDUCATION IMPLEMENTATION OUT-**  
3                   **COMES.**

4           Not later than 120 days after the date of the enact-  
5   ment of this Act, the Administrator shall submit to the  
6   appropriate committees of Congress a report on the  
7   metrics, internal and external relationships, and resources  
8   committed by NASA to each of the following:

9           (1) The development of a national STEM work-  
10   force.

11          (2) The retention of students in STEM dis-  
12   ciplines as reflected by their education progression  
13   over time.

14          (3) The development of strategic partnerships  
15   and linkages between STEM formal and informal  
16   education providers.

17   **SEC. 1002. SENSE OF CONGRESS ON THE EXPERIMENTAL**  
18                   **PROGRAM TO STIMULATE COMPETITIVE RE-**  
19                   **SEARCH.**

20   It is the sense of Congress that—

21          (1) the Experimental Program to Stimulate  
22   Competitive Research of NASA strengthens the re-  
23   search capabilities of jurisdictions that historically  
24   have not participated equally in competitive aero-  
25   space and aerospace-related research activities;

1           (2) the Experimental Program to Stimulate  
2 Competitive Research of NASA has provided the  
3 American taxpayer with an excellent return on in-  
4 vestment;

5           (3) the Experimental Program to Stimulate  
6 Competitive Research of NASA has been successful  
7 in helping to achieve broader geographical distribu-  
8 tion of research and development support by improv-  
9 ing the research infrastructure in States that his-  
10 torically have received limited Federal research and  
11 development funds; and

12           (4) in order to continue improvement and to in-  
13 crease efficiency the award of grants under the Ex-  
14 perimental Program to Stimulate Competitive Re-  
15 search of NASA should be coordinated with the  
16 award of grants under the Experimental Program to  
17 Stimulate Competitive Research of the National  
18 Science Foundation, the Department of Energy, the  
19 Department of Agriculture, the Department of De-  
20 fense, the Environmental Protection Agency, and the  
21 National Institutes of Health.

1 **SEC. 1003. SCIENCE, TECHNOLOGY, ENGINEERING, AND**  
2 **MATHEMATICS COMMERCIAL ORBITAL PLAT-**  
3 **FORM PROGRAM.**

4 A fundamental and unique capability of NASA is in  
5 stimulating science, technology, engineering, and mathe-  
6 matics education in the United States. In ensuring max-  
7 imum use of that capability, NASA shall—

8 (1) establish a program to annually sponsor sci-  
9 entific and educational payloads developed with  
10 United States student and educator involvement to  
11 be flown on commercially available orbital platforms,  
12 when available and operational, with the goal of  
13 launching at least 50 such payloads (with at least  
14 one from each of the 50 States) to orbit on at least  
15 one mission per year;

16 (2) contract with providers of commercial or-  
17 bital platform services for their use by the STEM-  
18 Commercial Orbital Platform program, preceded by  
19 the issuance of a request for proposal, not later than  
20 90 days after the date of enactment of this Act, to  
21 enter into at least one funded, competitively-awarded  
22 contract for commercial orbital platform services and  
23 make awards within 180 days after such date; and

24 (3) engage with United States students and  
25 educators and make available NASA's science, engi-  
26 neering, payload development, and payload oper-



1        ations expertise to student teams selected to partici-  
2        pate in the STEM-Commercial Orbital Platform pro-  
3        gram.

4        **TITLE XI—RE-SCOPING AND RE-**  
5        **VITALIZING    INSTITUTIONAL**  
6        **CAPABILITIES**

7        **SEC. 1101. SENSE OF CONGRESS.**

8        It is the sense of Congress that NASA needs to re-  
9        scope, and as appropriate, down-size, to fit current and  
10       future missions and expected funding levels. Eighty per-  
11       cent of NASA’s facilities are over 40 years old. Addition-  
12       ally, in a number of areas NASA finds itself “holding  
13       onto” facilities and capabilities scaled to another era.

14       **SEC. 1102. INSTITUTIONAL REQUIREMENTS STUDY.**

15       Within 1 year after the date of enactment of this Act,  
16       the Administrator shall provide to the appropriate com-  
17       mittees of Congress a comprehensive study that, taking  
18       into account the long term direction provided by this Act,  
19       carefully examines NASA’s structure, organization, and  
20       institutional assets and identifies a strategy to evolve to-  
21       ward the most efficient retention, sizing, and distribution  
22       of facilities, laboratories, test capabilities, and other infra-  
23       structure consistent with NASA’s missions and mandates.  
24       The Administrator should pay particular attention to iden-  
25       tifying and removing unneeded or duplicative infrastruc-

1 ture. The Administrator should include in the study a sug-  
2 gested reconfiguration and reinvestment strategy that  
3 would conform the needed equipment, facilities, test equip-  
4 ment, and related organizational alignment that would  
5 best meet the requirements of missions and priorities au-  
6 thorized and directed by this Act. As part of this strategy,  
7 the Administrator should include consideration and appli-  
8 cation of the findings and recommendations of the Na-  
9 tional Research Council report, Capabilities for the Fu-  
10 ture: An Assessment of NASA Laboratories for Basic Re-  
11 search, prepared in response to section 1003 of the Na-  
12 tional Aeronautics and Space Administration Authoriza-  
13 tion Act of 2008 (42 U.S.C. 17812).

14 **SEC. 1103. NASA CAPABILITIES STUDY REQUIREMENT.**

15       Upon completion of the study required by Section  
16 1102, the Administrator shall establish an independent  
17 panel to examine alternative management models for  
18 NASA's workforce, centers, and related facilities in order  
19 to improve efficiency and productivity, while nonetheless  
20 maintaining core Federal competencies and keeping ap-  
21 propriately governmental functions internal to NASA. The  
22 study shall include a recommended implementation strat-  
23 egy, which shall identify any additional legislative authori-  
24 ties necessary to enable implementation of the rec-  
25 ommended strategy, including recommended actions to

1 provide aid and assistance to eligible communities to miti-  
2 gate adverse impacts resulting from implementation of the  
3 proposed strategy. The Administrator shall provide the re-  
4 sults of this study to the appropriate committees of Con-  
5 gress within 1 year after the date on which the study is  
6 begun.

7 **SEC. 1104. SENSE OF CONGRESS ON COMMUNITY TRANSI-**  
8 **TION SUPPORT.**

9 The Congress recognizes and supports current execu-  
10 tive branch efforts to assist and provide aid to commu-  
11 nities that are adversely impacted by NASA program  
12 changes, contract or program cancellations, or proposed  
13 institutional changes, so as to minimize the social and eco-  
14 nomic impacts to those communities, workers, and busi-  
15 nesses. Communities eligible for such aid would be those  
16 in close proximity to NASA mission-related centers and  
17 their component facilities located in Alabama, California,  
18 Florida, Louisiana, Maryland, Mississippi, New Mexico,  
19 Ohio, Texas, and Virginia which may be impacted by pro-  
20 gram changes authorized or directed by this Act or by the  
21 implementation strategy developed pursuant to section  
22 1103.

1 **SEC. 1105. WORKFORCE STABILIZATION AND CRITICAL**  
2 **SKILLS PRESERVATION.**

3 Prior to receipt by the Congress of the study, rec-  
4 ommendations, and implementation strategy developed  
5 pursuant to section 1103, none of the funds authorized  
6 for use under this Act may be used to transfer the func-  
7 tions, missions, or activities, and associated civil service  
8 and contractor positions, from any NASA facility without  
9 authorization by the Congress to implement the proposed  
10 strategy. The Administrator shall preserve the critical  
11 skills and competencies in place at NASA centers prior  
12 to enactment of this Act in order to facilitate timely imple-  
13 mentation of the requirements of this Act and to minimize  
14 disruption to the workforce. The Administrator may not  
15 implement any reduction-in-force or other involuntary sep-  
16 arations of permanent, non-Senior-Executive-Service, civil  
17 servant employees before September 30, 2013, except for  
18 cause on charges of misconduct, delinquency, or ineffi-  
19 ciency.

20 **TITLE XII—OTHER MATTERS**

21 **SEC. 1201. REPORT ON SPACE TRAFFIC MANAGEMENT.**

22 The Administrator shall submit to the appropriate  
23 committees of Congress a report on a status on the initi-  
24 ation of discussions with other nations on a framework  
25 to address space traffic management concerns, as required  
26 by section 1102 of the National Aeronautics and Space

1 Administration Act Authorization Act of 2008 (42 U.S.C.  
2 17821).

3 **SEC. 1202. NATIONAL AND INTERNATIONAL ORBITAL DE-**  
4 **BRIS MITIGATION.**

5 (a) FINDINGS.—Congress makes the following find-  
6 ings:

7 (1) A national and international effort is need-  
8 ed to develop a coordinated approach towards the  
9 prevention, negation, and removal of orbital debris.

10 (2) The guidelines issued by the Inter-Agency  
11 Space Debris Coordination Committee provide a con-  
12 sensus understanding of 10 national space agencies  
13 (including NASA) plus the European Space Agency  
14 on the necessity of mitigating the creation of space  
15 debris and measures for doing so. NASA's participa-  
16 tion on the Committee should be robust, and NASA  
17 should urge other space-relevant Federal agencies  
18 (including the Departments of State, Defense, and  
19 Commerce) to work to ensure that their counterpart  
20 agencies in foreign governments are aware of these  
21 national commitments and the importance in which  
22 the United States holds them.

23 (3) Key components of such an approach should  
24 include—

1           (A) a process for debris prevention through  
2           agreements regarding spacecraft design, oper-  
3           ations, and end-of-life disposition plans to mini-  
4           mize orbiting vehicles or elements which are  
5           nonfunctional;

6           (B) the development of a robust Space Sit-  
7           uational Awareness network that can identify  
8           potential collisions and provide sufficient trajec-  
9           tory and orbital data to enable avoidance ma-  
10          neuvers;

11          (C) the interagency development of an  
12          overall strategy for review by the President,  
13          with recommendations for proposed inter-  
14          national collaborative efforts to address this  
15          challenge.

16          (b) INTERNATIONAL DISCUSSION.—

17           (1) IN GENERAL.—The Administrator shall, in  
18           consultation with such other departments and agen-  
19           cies of the Federal Government as the Administrator  
20           considers appropriate, continue and strengthen dis-  
21           cussions with the representatives of other space-  
22           faring countries, within the Inter-Agency Space De-  
23           bris Coordination Committee and elsewhere, to deal  
24           with this orbital debris mitigation.

1           (2) INTERAGENCY EFFORT.—For purposes of  
2 carrying out this subsection, the Director of OSTP,  
3 in coordination with the Director of the National Se-  
4 curity Council and using the President’s Council of  
5 Advisors on Science and Technology coordinating  
6 mechanism, shall develop an overall strategy for re-  
7 view by the President, with recommendations for  
8 proposed international collaborative efforts to ad-  
9 dress this challenge.

10 **SEC. 1203. REPORTS ON PROGRAM AND COST ASSESSMENT**  
11 **AND CONTROL ASSESSMENT.**

12           (a) FINDINGS.—Congress makes the following find-  
13 ings:

14           (1) The adherence of NASA to program cost  
15 and schedule targets and discipline across NASA  
16 programs remains a concern.

17           (2) The James Webb Space Telescope has ex-  
18 ceeded its cost estimate.

19           (3) In 2007 the Government Accountability Of-  
20 fice issued a report on NASA’s high risk acquisition  
21 performance.

22           (4) In response, NASA prepared a corrective  
23 action plan two years ago.

24           (b) REPORTS.—

1           (1) REPORTS REQUIRED.—Not later than 90  
2 days after the date of the enactment of this Act, and  
3 not later than April 30 of each year thereafter, the  
4 Administrator shall submit to the appropriate com-  
5 mittees of Congress a report on the implementation  
6 during the preceding year for the corrective action  
7 plan referred to in subsection (a)(4).

8           (2) ELEMENTS.—Each report under this sub-  
9 section shall set forth, for the year covered by such  
10 report, the following:

11           (A) A description of each NASA program  
12 that has exceeded its cost baseline by 15 per-  
13 cent or more or is more than 2 years behind its  
14 projected development schedule.

15           (B) For each program specified under sub-  
16 paragraph (A), a plan for such decrease in  
17 scope or requirements, or other measures, to be  
18 undertaken to control cost and schedule, includ-  
19 ing any cost monitoring or corrective actions  
20 undertaken pursuant to the National Aero-  
21 nautics and Space Administration Authorization  
22 Act of 2005 (Public Law 109–155), and the  
23 amendments made by that Act.



1 **SEC. 1204. ELIGIBILITY FOR SERVICE OF INDIVIDUAL CUR-**  
2 **RENTLY SERVING AS ADMINISTRATOR OF**  
3 **NASA.**

4 The individual serving in the position of Adminis-  
5 trator of the National Aeronautics and Space Administra-  
6 tion as of the date of the enactment of this Act comes  
7 from civilian life and is therefore eligible to serve in such  
8 position, in conformance with section 202 of the National  
9 Aeronautics and Space Act of 1958 (42 U.S.C. 2472(a)).

10 **SEC. 1205. SENSE OF CONGRESS ON INDEPENDENT**  
11 **VERIFICATION AND VALIDATION OF NASA**  
12 **SOFTWARE.**

13 It is the sense of Congress that—

14 (1) safety is at the heart of every NASA mis-  
15 sion;

16 (2) the Office of Safety and Mission Assurance  
17 remains vital to assuring the safety of all NASA ac-  
18 tivities;

19 (3) among the most important activities of the  
20 Office of Safety and Mission Assurance is the per-  
21 formance of independent safety and mission assur-  
22 ance assessments and process verification reviews;

23 (4) as NASA embarks on a new path, inde-  
24 pendent verification and validation of software must  
25 be of the highest priority to ensure safety through-  
26 out all NASA programs;

1           (5) NASA’s activities depend on software integ-  
2           rity to achieve their goals and deliver a successful  
3           mission to the American people;

4           (6) independent verification and validation is  
5           necessary to ensure that safety-critical software will  
6           operate dependably and support mission success;

7           (7) the creation of the Independent Verification  
8           and Validation Facility of NASA was the direct re-  
9           sult of recommendations made by the National Re-  
10          search Council and the Report of the Presidential  
11          Commission on the Space Shuttle Challenger Acci-  
12          dent;

13          (8) the mission-critical software of NASA must  
14          operate dependably and safely;

15          (9) the Independent Verification and Validation  
16          Facility of NASA plays an important role in assur-  
17          ing the safety of all NASA activities by improving  
18          methodologies for risk identification and assessment,  
19          and providing recommendations for risk mitigation  
20          and acceptance; and

21          (10) the Independent Verification and Valid-  
22          ation Facility shall be the sole provider of inde-  
23          pendent verification and validation services for soft-  
24          ware created by or for NASA.

1 **SEC. 1206. COUNTERFEIT PARTS.**

2 (a) IN GENERAL.—The Administrator shall plan, de-  
3 velop, and implement a program, in coordination with  
4 other Federal agencies, to detect, track, catalog, and re-  
5 duce the number of counterfeit electronic parts in the  
6 NASA supply chain.

7 (b) REQUIREMENTS.—In carrying out the program,  
8 the Administrator shall establish—

9 (1) counterfeit part identification training for  
10 all employees that procure, process, distribute, and  
11 install electronic parts that will—

12 (A) teach employees how to identify coun-  
13 terfeit parts;

14 (B) educate employees on procedures to  
15 follow if they suspect a part is counterfeit;

16 (C) regularly update employees on new  
17 threats, identification techniques, and reporting  
18 requirements; and

19 (D) integrate industry associations, manu-  
20 facturers, suppliers, and other Federal agencies,  
21 as appropriate;

22 (2) an internal database to track all suspected  
23 and confirmed counterfeit electronic parts that will  
24 maintain, at a minimum—

25 (A) companies and individuals known and  
26 suspected of selling counterfeit parts;

1 (B) parts known and suspected of being  
2 counterfeit, including lot and date codes, part  
3 numbers, and part images;

4 (C) countries of origin;

5 (D) sources of reporting;

6 (E) United States Customs seizures; and

7 (F) Government-Industry Data Exchange  
8 Program reports and other public or private  
9 sector database notifications; and

10 (3) a mechanism to report all information on  
11 suspected and confirmed counterfeit electronic parts  
12 to law enforcement agencies, industry associations,  
13 and other databases, and to issue bulletins to indus-  
14 try on counterfeit electronic parts and related coun-  
15 terfeit activity.

16 (c) REVIEW OF PROCUREMENT AND ACQUISITION  
17 POLICY.—

18 (1) IN GENERAL.—In establishing the program,  
19 the Administrator shall amend existing acquisition  
20 and procurement policy to purchase electronic parts  
21 from trusted or approved manufacturers. To deter-  
22 mine trusted or approved manufacturers, the Admin-  
23 istrator shall establish a list, assessed and adjusted  
24 at least annually, and create criteria for manufactur-  
25 ers to meet in order to be placed onto the list.

1 (2) CRITERIA.—The criteria may include—

2 (A) authentication or encryption codes;

3 (B) embedded security markings in parts;

4 (C) unique, harder to copy labels and  
5 markings;

6 (D) identifying distinct lot and serial codes  
7 on external packaging;

8 (E) radio frequency identification embed-  
9 ded into high-value parts;

10 (F) physical destruction of all defective,  
11 damaged, and sub-standard parts that are by-  
12 products of the manufacturing process;

13 (G) testing certifications;

14 (H) maintenance of procedures for han-  
15 dling any counterfeit parts that slip through;

16 (I) maintenance of secure facilities to pre-  
17 vent unauthorized access to proprietary infor-  
18 mation; and

19 (J) maintenance of product return, buy  
20 back, and inventory control practices that limit  
21 counterfeiting.

22 (d) REPORT TO CONGRESS.—Within one year after  
23 the date of enactment of this Act, the Administrator shall  
24 report on the progress of implementing this section to the  
25 appropriate committees of Congress.

1 **SEC. 1207. INFORMATION SECURITY.**

2 (a) **MONITORING RISK.**—

3 (1) **UPDATE ON SYSTEM IMPLEMENTATION.**—

4 Not later than 120 days after the date of enactment  
5 of this Act, and on a biennial basis thereafter, the  
6 chief information officer of NASA, in coordination  
7 with other national security agencies, shall provide  
8 to the appropriate committees of Congress—

9 (A) an update on efforts to implement a  
10 system to provide dynamic, comprehensive, real-  
11 time information regarding risk of unauthorized  
12 remote, proximity, and insider use or access, for  
13 all information infrastructure under the respon-  
14 sibility of the chief information officer, and mis-  
15 sion-related networks, including contractor net-  
16 works;

17 (B) an assessment of whether the system  
18 has demonstrably and quantifiably reduced net-  
19 work risk compared to alternative methods of  
20 measuring security; and

21 (C) an assessment of the progress that  
22 each center and facility has made toward imple-  
23 menting the system.

24 (2) **EXISTING ASSESSMENTS.**—The assessments  
25 required of the Inspector General under section  
26 3545 of title 44, United States Code, shall evaluate

1 the effectiveness of the system described in this sub-  
2 section.

3 (b) INFORMATION SECURITY AWARENESS AND EDU-  
4 CATION.—

5 (1) IN GENERAL.—In consultation with the De-  
6 partment of Education, other national security agen-  
7 cies, and other agency directorates, the chief infor-  
8 mation officer shall institute an information security  
9 awareness and education program for all operators  
10 and users of NASA information infrastructure, with  
11 the goal of reducing unauthorized remote, proximity,  
12 and insider use or access.

13 (2) PROGRAM REQUIREMENTS.—

14 (A) The program shall include, at a min-  
15 imum, ongoing classified and unclassified  
16 threat-based briefings, and automated exercises  
17 and examinations that simulate common attack  
18 techniques.

19 (B) All agency employees and contractors  
20 engaged in the operation or use of agency infor-  
21 mation infrastructure shall participate in the  
22 program.

23 (C) Access to NASA information infra-  
24 structure shall only be granted to operators and

1 users who regularly satisfy the requirements of  
2 the program.

3 (D) The chief human capital officer of  
4 NASA, in consultation with the chief informa-  
5 tion officer, shall create a system to reward op-  
6 erators and users of agency information infra-  
7 structure for continuous high achievement in  
8 the program.

9 (c) INFORMATION INFRASTRUCTURE DEFINED.—In  
10 this section, the term “information infrastructure” means  
11 the underlying framework that information systems and  
12 assets rely on to process, transmit, receive, or store infor-  
13 mation electronically, including programmable electronic  
14 devices and communications networks and any associated  
15 hardware, software, or data.

16 **SEC. 1208. NATIONAL CENTER FOR HUMAN PERFORMANCE.**

17 (a) IN GENERAL.—The National Center for Human  
18 Performance is located in Houston’s Texas Medical Center  
19 which is home to 49 non-profit and academic patient care,  
20 biomedical research, and health educational institutions  
21 serving 6 million patients each year, and works collabo-  
22 ratively with individuals and organizations, including  
23 NASA, to advance science and research on human per-  
24 formance in space, health, the military, athletics, and the  
25 arts.



1 (b) DESIGNATION AS INSTITUTION OF EXCEL-  
2 LENCE.—The National Center for Human Performance is  
3 designated as an Institution of Excellence for Human Per-  
4 formance dedicated to understanding and improving all  
5 aspects of human performance.

6 **SEC. 1209. ENHANCED-USE LEASING.**

7 (a) SENSE OF THE CONGRESS.—It is the sense of the  
8 Congress that the NASA enhanced-use leasing program  
9 is a fiscally responsible program to further maintain the  
10 exploration-related infrastructure of our Nation’s space  
11 centers while ensuring continued private utilization of  
12 these Federal assets, and every effort should be made to  
13 ensure effective utilization of this program.

14 **SEC. 1210. SENSE OF CONGRESS CONCERNING THE STEN-**  
15 **NIS SPACE CENTER.**

16 It is the sense of the Congress that the Stennis Space  
17 Center represents the national capability for development  
18 and certification of liquid propulsion technologies vital to  
19 our Nation’s space flight program, and that the Federal  
20 government should fully utilize that resource and continue  
21 to make the testing facility available for further develop-  
22 ment of commercial aerospace capabilities.

1 **TITLE XIII—COMPLIANCE WITH**  
2 **STATUTORY PAY-AS-YOU-GO**  
3 **ACT OF 2010**

4 **SEC. 1301. COMPLIANCE PROVISION.**

5 The budgetary effects of this Act, for the purpose of  
6 complying with the Statutory Pay-As-You-Go-Act of 2010,  
7 shall be determined by reference to the latest statement  
8 titled “Budgetary Effects of PAYGO Legislation” for this  
9 Act, submitted for printing in the Congressional Record  
10 by the Chairman of the Senate Budget Committee, pro-  
11 vided that such statement has been submitted prior to the  
12 vote on passage.

Passed the Senate August 5, 2010.

Attest:

*Secretary.*



111<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

**S. 3729**

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**AN ACT**

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2011 through 2013, and for other purposes.