

116TH CONGRESS
2D SESSION

S. 2800

AN ACT

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

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

1 **SECTION 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 2020”.

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

Sec. 1. Short title; table of contents.

Sec. 2. Definitions.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

Sec. 101. Authorization of appropriations.

TITLE II—HUMAN SPACEFLIGHT AND EXPLORATION

Sec. 201. Advanced cislunar and lunar surface capabilities.

Sec. 202. Space launch system configurations.

Sec. 203. Advanced spacesuits.

Sec. 204. Acquisition of domestic space transportation and logistics resupply
 services.

Sec. 205. Rocket engine test infrastructure.

Sec. 206. Indian River Bridge.

Sec. 207. Pearl River maintenance.

Sec. 208. Value of International Space Station and capabilities in low-Earth
 orbit.

Sec. 209. Extension and modification relating to International Space Station.

Sec. 210. Department of Defense activities on International Space Station.

Sec. 211. Commercial development in low-Earth orbit.

Sec. 212. Maintaining a national laboratory in space.

Sec. 213. International Space Station national laboratory; property rights in in-
 ventions.

Sec. 214. Data first produced during non-NASA scientific use of the ISS na-
 tional laboratory.

Sec. 215. Payments received for commercial space-enabled production on the
 ISS.

Sec. 216. Stepping stone approach to exploration.

Sec. 217. Technical amendments relating to Artemis missions.

TITLE III—SCIENCE

Sec. 301. Science priorities.

Sec. 302. Lunar discovery program.

Sec. 303. Search for life.

Sec. 304. James Webb Space Telescope.

Sec. 305. Wide-Field Infrared Survey Telescope.

Sec. 306. Study on satellite servicing for science missions.

Sec. 307. Earth science missions and programs.

Sec. 308. Life science and physical science research.

Sec. 309. Science missions to Mars.

Sec. 310. Planetary Defense Coordination Office.

- Sec. 311. Suborbital science flights.
- Sec. 312. Earth science data and observations.
- Sec. 313. Sense of Congress on small satellite science.
- Sec. 314. Sense of Congress on commercial space services.
- Sec. 315. Procedures for identifying and addressing alleged violations of scientific integrity policy.

TITLE IV—AERONAUTICS

- Sec. 401. Short title.
- Sec. 402. Definitions.
- Sec. 403. Experimental aircraft projects.
- Sec. 404. Unmanned aircraft systems.
- Sec. 405. 21st Century Aeronautics Capabilities Initiative.
- Sec. 406. Sense of Congress on on-demand air transportation.
- Sec. 407. Sense of Congress on hypersonic technology research.

TITLE V—SPACE TECHNOLOGY

- Sec. 501. Space Technology Mission Directorate.
- Sec. 502. Flight opportunities program.
- Sec. 503. Small Spacecraft Technology Program.
- Sec. 504. Nuclear propulsion technology.
- Sec. 505. Mars-forward technologies.
- Sec. 506. Prioritization of low-enriched uranium technology.
- Sec. 507. Sense of Congress on next-generation communications technology.
- Sec. 508. Lunar surface technologies.

TITLE VI—STEM ENGAGEMENT

- Sec. 601. Sense of Congress.
- Sec. 602. STEM education engagement activities.
- Sec. 603. Skilled technical education outreach program.
- Sec. 604. National space grant college and fellowship program.

TITLE VII—WORKFORCE AND INDUSTRIAL BASE

- Sec. 701. Appointment and compensation pilot program.
- Sec. 702. Establishment of multi-institution consortia.
- Sec. 703. Expedited access to technical talent and expertise.
- Sec. 704. Report on industrial base for civil space missions and operations.
- Sec. 705. Separations and retirement incentives.
- Sec. 706. Confidentiality of medical quality assurance records.

TITLE VIII—MISCELLANEOUS PROVISIONS

- Sec. 801. Contracting authority.
- Sec. 802. Authority for transaction prototype projects and follow-on production contracts.
- Sec. 803. Protection of data and information from public disclosure.
- Sec. 804. Physical security modernization.
- Sec. 805. Lease of non-excess property.
- Sec. 806. Cybersecurity.
- Sec. 807. Limitation on cooperation with the People's Republic of China.
- Sec. 808. Consideration of issues related to contracting with entities receiving assistance from or affiliated with the People's Republic of China.

- Sec. 809. Small satellite launch services program.
- Sec. 810. 21st century space launch infrastructure.
- Sec. 811. Missions of national need.
- Sec. 812. Drinking water well replacement for Chincoteague, Virginia.
- Sec. 813. Passenger carrier use.
- Sec. 814. Use of commercial near-space balloons.
- Sec. 815. President's Space Advisory Board.
- Sec. 816. Initiative on technologies for noise and emissions reductions.
- Sec. 817. Remediation of sites contaminated with trichloroethylene.
- Sec. 818. Report on merits and options for establishing an institute relating to space resources.
- Sec. 819. Report on establishing center of excellence for space weather technology.
- Sec. 820. Review on preference for domestic suppliers.
- Sec. 821. Report on utilization of commercial spaceports licensed by Federal Aviation Administration.
- Sec. 822. Active orbital debris mitigation.
- Sec. 823. Study on commercial communications services.

1 **SEC. 2. DEFINITIONS.**

2 In this Act:

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

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

9 (3) APPROPRIATE COMMITTEES OF CON-
 10 GRESS.—Except as otherwise expressly provided, the
 11 term “appropriate committees of Congress”
 12 means—

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

15 (B) the Committee on Science, Space, and
 16 Technology of the House of Representatives.

1 (4) CISELUNAR SPACE.—The term “cislunar
2 space” means the region of space beyond low-Earth
3 orbit out to and including the region around the sur-
4 face of the Moon.

5 (5) DEEP SPACE.—The term “deep space”
6 means the region of space beyond low-Earth orbit,
7 including cislunar space.

8 (6) DEVELOPMENT COST.—The term “develop-
9 ment cost” has the meaning given the term in sec-
10 tion 30104 of title 51, United States Code.

11 (7) ISS.—The term “ISS” means the Inter-
12 national Space Station.

13 (8) ISS MANAGEMENT ENTITY.—The term
14 “ISS management entity” means the organization
15 with which the Administrator has entered into a co-
16 operative agreement under section 504(a) of the Na-
17 tional Aeronautics and Space Administration Au-
18 thorization Act of 2010 (42 U.S.C. 18354(a)).

19 (9) NASA.—The term “NASA” means the Na-
20 tional Aeronautics and Space Administration.

21 (10) ORION.—The term “Orion” means the
22 multipurpose crew vehicle described in section 303 of
23 the National Aeronautics and Space Administration
24 Authorization Act of 2010 (42 U.S.C. 18323).

1 (11) OSTP.—The term “OSTP” means the Of-
2 fice of Science and Technology Policy.

3 (12) SPACE LAUNCH SYSTEM.—The term
4 “Space Launch System” means the Space Launch
5 System authorized under section 302 of the National
6 Aeronautics and Space Administration Act of 2010
7 (42 U.S.C. 18322).

8 **TITLE I—AUTHORIZATION OF** 9 **APPROPRIATIONS**

10 **SEC. 101. AUTHORIZATION OF APPROPRIATIONS.**

11 There are authorized to be appropriated to the Ad-
12 ministration for fiscal year 2021 \$23,495,000,000 as fol-
13 lows:

14 (1) For Exploration, \$6,706,400,000.

15 (2) For Space Operations, \$3,988,200,000.

16 (3) For Science, \$7,274,700,000.

17 (4) For Aeronautics, \$828,700,000.

18 (5) For Space Technology, \$1,206,000,000.

19 (6) For Science, Technology, Engineering, and
20 Mathematics Engagement, \$120,000,000.

21 (7) For Safety, Security, and Mission Services,
22 \$2,936,500,000.

23 (8) For Construction and Environmental Com-
24 pliance and Restoration, \$390,300,000.

25 (9) For Inspector General, \$44,200,000.

1 **TITLE II—HUMAN SPACEFLIGHT**
2 **AND EXPLORATION**

3 **SEC. 201. ADVANCED CISLUNAR AND LUNAR SURFACE CA-**
4 **PABILITIES.**

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

7 (1) commercial entities in the United States
8 have made significant investment and progress to-
9 ward the development of human-class lunar landers;

10 (2) NASA developed the Artemis program—

11 (A) to fulfill the goal of landing United
12 States astronauts, including the first woman
13 and the next man, on the Moon; and

14 (B) to collaborate with commercial and
15 international partners to establish sustainable
16 lunar exploration by 2028; and

17 (3) in carrying out the Artemis program, the
18 Administration should ensure that the entire
19 Artemis program is inclusive and representative of
20 all people of the United States, including women and
21 minorities.

22 (b) LANDER PROGRAM.—

23 (1) IN GENERAL.—The Administrator shall fos-
24 ter the flight demonstration of not more than 2

1 human-class lunar lander designs through public-pri-
2 vate partnerships.

3 (2) INITIAL DEVELOPMENT PHASE.—The Ad-
4 ministrator may support the formulation of more
5 than 2 concepts in the initial development phase.

6 (c) REQUIREMENTS.—In carrying out the program
7 under subsection (b), the Administrator shall—

8 (1) enter into industry-led partnerships using a
9 fixed-price, milestone-based approach;

10 (2) to the maximum extent practicable, encour-
11 age reusability and sustainability of systems devel-
12 oped;

13 (3) prioritize safety and implement robust
14 ground and in-space test requirements;

15 (4) ensure availability of 1 or more lunar polar
16 science payloads for a demonstration mission; and

17 (5) to the maximum extent practicable, offer ex-
18 isting capabilities and assets of NASA centers to
19 support these partnerships.

20 **SEC. 202. SPACE LAUNCH SYSTEM CONFIGURATIONS.**

21 (a) MOBILE LAUNCH PLATFORM.—The Adminis-
22 trator is authorized to maintain 2 operational mobile
23 launch platforms to enable the launch of multiple configu-
24 rations of the Space Launch System.

1 (b) EXPLORATION UPPER STAGE.—To meet the ca-
 2 pability requirements under section 302(c)(2) of the Na-
 3 tional Aeronautics and Space Administration Authoriza-
 4 tion Act of 2010 (42 U.S.C. 18322(c)(2)), the Adminis-
 5 trator shall continue development of the Exploration
 6 Upper Stage for the Space Launch System with a sched-
 7 uled availability sufficient for use on the third launch of
 8 the Space Launch System.

9 (c) BRIEFING.—Not later than 90 days after the date
 10 of the enactment of this Act, the Administrator shall brief
 11 the appropriate committees of Congress on the develop-
 12 ment and scheduled availability of the Exploration Upper
 13 Stage for the third launch of the Space Launch System.

14 (d) MAIN PROPULSION TEST ARTICLE.—To meet the
 15 requirements under section 302(c)(3) of the National Aer-
 16 onautics and Space Administration Authorization Act of
 17 2010 (42 U.S.C. 18322(c)(3)), the Administrator shall—

18 (1) immediately on completion of the first full-
 19 duration integrated core stage test of the Space
 20 Launch System, initiate development of a main pro-
 21 pulsion test article for the integrated core stage pro-
 22 pulsion elements of the Space Launch System, con-
 23 sistent with cost and schedule constraints, particu-
 24 larly for long-lead propulsion hardware needed for
 25 flight;

(2) not later than 180 days after the date of the enactment of this Act, submit to the appropriate committees of Congress a detailed plan for the development and operation of such main propulsion test article; and

(3) use existing capabilities of NASA centers for the design, manufacture, and operation of the main propulsion test article.

9 SEC. 203. ADVANCED SPACESUITS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that next-generation advanced spacesuits are a critical technology for human space exploration and use of low-Earth orbit, cislunar space, the surface of the Moon, and Mars.

(b) DEVELOPMENT PLAN.—The Administrator shall establish a detailed plan for the development and manufacture of advanced spacesuits, consistent with the deep space exploration goals and timetables of NASA.

(c) DIVERSE ASTRONAUT CORPS.—The Administrator shall ensure that spacesuits developed and manufactured after the date of the enactment of this Act are capable of accommodating a wide range of sizes of astronauts so as to meet the needs of the diverse NASA astronaut corps.

1 (d) ISS USE.—Throughout the operational life of the
2 ISS, the Administrator should fully use the ISS for testing
3 advanced spacesuits.

4 (e) PRIOR INVESTMENTS.—

5 (1) IN GENERAL.—In developing an advanced
6 spacesuit, the Administrator shall, to the maximum
7 extent practicable, partner with industry-proven
8 spacesuit design, development, and manufacturing
9 suppliers and leverage prior and existing investments
10 in advanced spacesuit technologies and existing ca-
11 pabilities at NASA centers to maximize the benefits
12 of such investments and technologies.

13 (2) AGREEMENTS WITH PRIVATE ENTITIES.—In
14 carrying out this subsection, the Administrator may
15 enter into 1 or more agreements with 1 or more pri-
16 vate entities for the manufacture of advanced
17 spacesuits, as the Administrator considers appro-
18 priate.

19 (f) BRIEFING.—Not later than 180 days after the
20 date of the enactment of this Act, and semiannually there-
21 after until NASA procures advanced spacesuits under this
22 section, the Administrator shall brief the appropriate com-
23 mittees of Congress on the development plan in subsection
24 (b).

1 **SEC. 204. ACQUISITION OF DOMESTIC SPACE TRANSPOR-**
2 **TATION AND LOGISTICS RESUPPLY SERV-**
3 **ICES.**

4 (a) IN GENERAL.—Except as provided in subsection
5 (b), the Administrator shall not enter into any contract
6 with a person or entity that proposes to use, or will use,
7 a foreign launch provider for a commercial service to pro-
8 vide space transportation or logistics resupply for—

9 (1) the ISS; or

10 (2) any Government-owned or Government-
11 funded platform in Earth orbit or cislunar space, on
12 the lunar surface, or elsewhere in space.

13 (b) EXCEPTION.—The Administrator may enter into
14 a contract with a person or an entity that proposes to use,
15 or will use, a foreign launch provider for a commercial
16 service to carry out an activity described in subsection (a)
17 if—

18 (1) a domestic vehicle or service is unavailable;
19 or

20 (2) the launch vehicle or service is a contribu-
21 tion by a partner to an international no-exchange-of-
22 funds collaborative effort.

23 (c) RULE OF CONSTRUCTION.—Nothing in this sec-
24 tion shall be construed to prohibit the Administrator from
25 entering into 1 or more no-exchange-of-funds collaborative

1 agreements with an international partner in support of the
2 deep space exploration plan of NASA.

3 **SEC. 205. ROCKET ENGINE TEST INFRASTRUCTURE.**

4 (a) IN GENERAL.—The Administrator shall continue
5 to carry out a program to modernize rocket propulsion test
6 infrastructure at NASA facilities—

7 (1) to increase capabilities;

8 (2) to enhance safety;

9 (3) to support propulsion development and test-
10 ing; and

11 (4) to foster the improvement of Government
12 and commercial space transportation and explo-
13 ration.

14 (b) PROJECTS.—Projects funded under the program
15 described in subsection (a) may include—

16 (1) infrastructure and other facilities and sys-
17 tems relating to rocket propulsion test stands and
18 rocket propulsion testing;

19 (2) enhancements to test facility capacity and
20 flexibility; and

21 (3) such other projects as the Administrator
22 considers appropriate to meet the goals described in
23 that subsection.

24 (c) REQUIREMENTS.—In carrying out the program
25 under subsection (a), the Administrator shall—

1 (1) prioritize investments in projects that en-
2 hance test and flight certification capabilities for
3 large thrust-level atmospheric and altitude engines
4 and engine systems, and multi-engine integrated test
5 capabilities;

6 (2) continue to make underutilized test facilities
7 available for commercial use on a reimbursable
8 basis; and

9 (3) ensure that no project carried out under
10 this program adversely impacts, delays, or defers
11 testing or other activities associated with facilities
12 used for Government programs, including—

13 (A) the Space Launch System and the Ex-
14 ploration Upper Stage of the Space Launch
15 System;

16 (B) in-space propulsion to support explo-
17 ration missions; or

18 (C) nuclear propulsion testing.

19 (d) RULE OF CONSTRUCTION.—Nothing in this sec-
20 tion shall preclude a NASA program, including the Space
21 Launch System and the Exploration Upper Stage of the
22 Space Launch System, from using the modernized test in-
23 frastructure developed under this section.

24 (e) WORKING CAPITAL FUND STUDY.—

1 (1) IN GENERAL.—Not later than 180 days
2 after the date of the enactment of this Act, the Ad-
3 ministrator shall submit to the appropriate commit-
4 tees of Congress a report on the use of the authority
5 under section 30102 of title 51, United States Code,
6 to promote increased use of NASA rocket propulsion
7 test infrastructure for research, development, test-
8 ing, and evaluation activities by other Federal agen-
9 cies, firms, associations, corporations, and edu-
10 cational institutions.

11 (2) MATTERS TO BE INCLUDED.—The report
12 required by paragraph (1) shall include the fol-
13 lowing:

14 (A) An assessment of prior use, if any, of
15 the authority under section 30102 of title 51,
16 United States Code, to improve testing infra-
17 structure.

18 (B) An analysis of any barrier to imple-
19 mentation of such authority for the purpose of
20 promoting increased use of NASA rocket pro-
21 pulsion test infrastructure.

22 **SEC. 206. INDIAN RIVER BRIDGE.**

23 (a) IN GENERAL.—The Administrator, in coordina-
24 tion with the heads of other Federal agencies that use the
25 Indian River Bridge on the NASA Causeway, shall develop

1 a plan to ensure that a bridge over the Indian River at
2 such location provides access to the Eastern Range for na-
3 tional security, civil, and commercial space operations.

4 (b) FEE OR TOLL DISCOURAGED.—The plan shall
5 strongly discourage the imposition of a user fee or toll on
6 a bridge over the Indian River at such location.

7 **SEC. 207. PEARL RIVER MAINTENANCE.**

8 (a) IN GENERAL.—The Administrator shall coordi-
9 nate with the Chief of the Army Corps of Engineers to
10 ensure the continued navigability of the Pearl River and
11 Little Lake channels sufficient to support NASA barge op-
12 erations surrounding Stennis Space Center and the
13 Michoud Assembly Facility.

14 (b) REPORT TO CONGRESS.—Not later than 180 days
15 after the date of the enactment of this Act, the Adminis-
16 trator shall submit to the appropriate committees of Con-
17 gress a report on efforts under subsection (a).

18 (c) APPROPRIATE COMMITTEES OF CONGRESS.—In
19 this section, the term “appropriate committees of Con-
20 gress” means—

21 (1) the Committee on Commerce, Science, and
22 Transportation, the Committee on Environment and
23 Public Works, and the Committee on Appropriations
24 of the Senate; and

1 (2) the Committee on Science, Space, and
2 Technology, the Committee on Transportation and
3 Infrastructure, and the Committee on Appropria-
4 tions of the House of Representatives.

5 **SEC. 208. VALUE OF INTERNATIONAL SPACE STATION AND**
6 **CAPABILITIES IN LOW-EARTH ORBIT.**

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

9 (1) it is in the national and economic security
10 interests of the United States to maintain a contin-
11 uous human presence in low-Earth orbit;

12 (2) low-Earth orbit should be used as a test bed
13 to advance human space exploration and scientific
14 discoveries; and

15 (3) the ISS is a critical component of economic,
16 commercial, and industrial development in low-Earth
17 orbit.

18 (b) HUMAN PRESENCE REQUIREMENT.—The United
19 States shall continuously maintain the capability for a
20 continuous human presence in low-Earth orbit through
21 and beyond the useful life of the ISS.

22 **SEC. 209. EXTENSION AND MODIFICATION RELATING TO**
23 **INTERNATIONAL SPACE STATION.**

24 (a) POLICY.—Section 501(a) of the National Aero-
25 nautics and Space Administration Authorization Act of

1 2010 (42 U.S.C. 18351(a)) is amended by striking
2 “2024” and inserting “2030”.

3 (b) MAINTENANCE OF UNITED STATES SEGMENT
4 AND ASSURANCE OF CONTINUED OPERATIONS.—Section
5 503(a) of the National Aeronautics and Space Administra-
6 tion Authorization Act of 2010 (42 U.S.C. 18353(a)) is
7 amended by striking “September 30, 2024” and inserting
8 “September 30, 2030”.

9 (c) RESEARCH CAPACITY ALLOCATION AND INTE-
10 GRATION OF RESEARCH PAYLOADS.—Section 504(d) of
11 the National Aeronautics and Space Administration Au-
12 thorization Act of 2010 (42 U.S.C. 18354(d)) is amend-
13 ed—

14 (1) in paragraph (1), in the first sentence—

15 (A) by striking “As soon as practicable”
16 and all that follows through “2011,” and in-
17 serting “The”; and

18 (B) by striking “September 30, 2024” and
19 inserting “September 30, 2030”; and

20 (2) in paragraph (2), in the third sentence, by
21 striking “September 30, 2024” and inserting “Sep-
22 tember 30, 2030”.

23 (d) MAINTENANCE OF USE.—

24 (1) IN GENERAL.—Section 70907 of title 51,
25 United States Code, is amended—

1 (A) in the section heading, by striking
2 “**2024**” and inserting “**2030**”;

3 (B) in subsection (a), by striking “Sep-
4 tember 30, 2024” and inserting “September 30,
5 2030”; and

6 (C) in subsection (b)(3), by striking “Sep-
7 tember 30, 2024” and inserting “September 30,
8 2030”.

9 (e) TRANSITION PLAN REPORTS.—Section
10 50111(c)(2) of title 51, United States Code is amended—

11 (1) in the matter preceding subparagraph (A),
12 by striking “2023” and inserting “2028”; and

13 (2) in subparagraph (J), by striking “2028”
14 and inserting “2030”.

15 (f) ELIMINATION OF INTERNATIONAL SPACE STA-
16 TION NATIONAL LABORATORY ADVISORY COMMITTEE.—
17 Section 70906 of title 51, United States Code, is repealed.

18 (g) CONFORMING AMENDMENTS.—Chapter 709 of
19 title 51, United States Code, is amended—

20 (1) by redesignating section 70907 as section
21 70906; and

22 (2) in the table of sections for the chapter, by
23 striking the items relating to sections 70906 and
24 70907 and inserting the following:

“70906. Maintaining use through at least 2030.”.

1 **SEC. 210. DEPARTMENT OF DEFENSE ACTIVITIES ON**
2 **INTERNATIONAL SPACE STATION.**

3 (a) IN GENERAL.—Not later than 180 days after the
4 date of the enactment of this Act, the Secretary of Defense
5 shall—

6 (1) identify and review each activity, program,
7 and project of the Department of Defense com-
8 pleted, being carried out, or planned to be carried
9 out on the ISS as of the date of the review; and

10 (2) provide to the appropriate committees of
11 Congress a briefing that describes the results of the
12 review.

13 (b) APPROPRIATE COMMITTEES OF CONGRESS DE-
14 FINED.—In this section, the term “appropriate commit-
15 tees of Congress” means—

16 (1) the Committee on Armed Services, the
17 Committee on Appropriations, and the Committee on
18 Commerce, Science, and Transportation of the Sen-
19 ate; and

20 (2) the Committee on Armed Services, the
21 Committee on Appropriations, and the Committee on
22 Science, Space, and Technology of the House of
23 Representatives.

1 **SEC. 211. COMMERCIAL DEVELOPMENT IN LOW-EARTH**
2 **ORBIT.**

3 (a) STATEMENT OF POLICY.—It is the policy of the
4 United States to encourage the development of a thriving
5 and robust United States commercial sector in low-Earth
6 orbit.

7 (b) PREFERENCE FOR UNITED STATES COMMERCIAL
8 PRODUCTS AND SERVICES.—The Administrator shall con-
9 tinue to increase the use of assets, products, and services
10 of private entities in the United States to fulfill the low-
11 Earth orbit requirements of the Administration.

12 (c) NONCOMPETITION.—

13 (1) IN GENERAL.—Except as provided in para-
14 graph (2), the Administrator may not offer to a for-
15 eign person or a foreign government a spaceflight
16 product or service relating to the ISS, if a com-
17 parable spaceflight product or service, as applicable,
18 is offered by a private entity in the United States.

19 (2) EXCEPTION.—The Administrator may offer
20 a spaceflight product or service relating to the ISS
21 to the government of a country that is a signatory
22 to the Agreement Among the Government of Can-
23 ada, Governments of Member States of the Euro-
24 pean Space Agency, the Government of Japan, the
25 Government of the Russian Federation, and the
26 Government of the United States of America Con-

cerning Cooperation on the Civil International Space Station, signed at Washington January 29, 1998, and entered into force on March 27, 2001 (TIAS 12927), including an international partner astronaut (as defined in section 50902 of title 51, United States Code) that is sponsored by the government of such a country.

(d) SHORT-DURATION COMMERCIAL MISSIONS.—To provide opportunities for additional transport of astronauts to the ISS and help establish a commercial market in low-Earth orbit, the Administrator may permit short-duration missions to the ISS for commercial passengers on a fully or partially reimbursable basis.

(e) PROGRAM AUTHORIZATION.—

(1) ESTABLISHMENT.—The Administrator shall establish a low-Earth orbit commercial development program to encourage the fullest commercial use and development of space by private entities in the United States.

(2) ELEMENTS.—The program established under paragraph (1) shall, to the maximum extent practicable, include activities—

(A) to stimulate demand for—

(i) space-based commercial research, development, and manufacturing;

1 (ii) spaceflight products and services;

2 and

3 (iii) human spaceflight products and

4 services in low-Earth orbit;

5 (B) to improve the capability of the ISS to

6 accommodate commercial users; and

7 (C) subject to paragraph (3), to foster the

8 development of commercial space stations and

9 habitats.

10 (3) COMMERCIAL SPACE STATIONS AND HABI-

11 TATS.—

12 (A) PRIORITY.—With respect to an activity

13 to develop a commercial space station or habi-

14 tat, the Administrator shall give priority to an

15 activity for which a private entity provides a

16 significant share of the cost to develop and op-

17 erate the activity.

18 (B) REPORT.—Not later than 30 days

19 after the date that an award or agreement is

20 made to carry out an activity to develop a com-

21 mercial space station or habitat, the Adminis-

22 trator shall submit to the appropriate commit-

23 tees of Congress a report on the development of

24 the commercial space station or habitat, as ap-

25 plicable, that includes—

1 (i) a business plan that describes the
2 manner in which the project will—

3 (I) meet the future requirements
4 of NASA for low-Earth orbit human
5 space-flight services; and

6 (II) fulfill the cost-share funding
7 prioritization under subparagraph (A);
8 and

9 (ii) a review of the viability of the
10 operational business case, including—

11 (I) the level of expected Govern-
12 ment participation;

13 (II) a list of anticipated non-
14 governmental and international cus-
15 tomers and associated contributions;
16 and

17 (III) an assessment of long-term
18 sustainability for the nongovernmental
19 customers, including an independent
20 assessment of the viability of the mar-
21 ket for such commercial services or
22 products.

1 **SEC. 212. MAINTAINING A NATIONAL LABORATORY IN**
2 **SPACE.**

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

5 (1) the United States segment of the Inter-
6 national Space Station (as defined in section 70905
7 of title 51, United States Code), which is designated
8 as a national laboratory under section 70905(b) of
9 title 51, United States Code—

10 (A) benefits the scientific community and
11 promotes commerce in space;

12 (B) fosters stronger relationships among
13 NASA and other Federal agencies, the private
14 sector, and research groups and universities;

15 (C) advances science, technology, engineer-
16 ing, and mathematics education through use of
17 the unique microgravity environment; and

18 (D) advances human knowledge and inter-
19 national cooperation;

20 (2) after the ISS is decommissioned, the United
21 States should maintain a national microgravity lab-
22 oratory in space;

23 (3) in maintaining a national microgravity lab-
24 oratory in space, the United States should make ap-
25 propriate accommodations for different types of own-

1 ership and operation arrangements for the ISS and
 2 future space stations;

3 (4) to the maximum extent practicable, a na-
 4 tional microgravity laboratory in space should be
 5 maintained in cooperation with international space
 6 partners; and

7 (5) NASA should continue to support funda-
 8 mental science research on future platforms in low-
 9 Earth orbit and cislunar space, orbital and sub-
 10 orbital flights, drop towers, and other microgravity
 11 testing environments.

12 (b) REPORT.—The Administrator, in coordination
 13 with the National Space Council and other Federal agen-
 14 cies as the Administrator considers appropriate, shall
 15 issue a report detailing the feasibility of establishing a
 16 microgravity national laboratory federally funded research
 17 and development center to carry out activities relating to
 18 the study and use of in-space conditions.

19 **SEC. 213. INTERNATIONAL SPACE STATION NATIONAL LAB-**
 20 **ORATORY; PROPERTY RIGHTS IN INVEN-**
 21 **TIONS.**

22 (a) IN GENERAL.—Subchapter III of chapter 201 of
 23 title 51, United States Code, is amended by adding at the
 24 end the following:

1 **“§ 20150. Property rights in designated inventions**

2 “(a) EXCLUSIVE PROPERTY RIGHTS.—Notwith-
3 standing section 3710a of title 15, chapter 18 of title 35,
4 section 20135, or any other provision of law, a designated
5 invention shall be the exclusive property of a user, and
6 shall not be subject to a Government-purpose license, if—

7 “(1)(A) the Administration is reimbursed under
8 the terms of the contract for the full cost of a con-
9 tribution by the Federal Government of the use of
10 Federal facilities, equipment, materials, proprietary
11 information of the Federal Government, or services
12 of a Federal employee during working hours, includ-
13 ing the cost for the Administration to carry out its
14 responsibilities under paragraphs (1) and (4) of sec-
15 tion 504(d) of the National Aeronautics and Space
16 Administration Authorization Act of 2010 (42
17 U.S.C. 18354(d));

18 “(B) Federal funds are not transferred to the
19 user under the contract; and

20 “(C) the designated invention was made (as de-
21 fined in section 20135(a))—

22 “(i) solely by the user; or

23 “(ii)(I) by the user with the services of a
24 Federal employee under the terms of the con-
25 tract; and

1 “(II) the Administration is reimbursed for
2 such services under subparagraph (B); or

3 “(2) the Administrator determines that the rel-
4 evant field of commercial endeavor is sufficiently im-
5 mature that granting exclusive property rights to the
6 user is necessary to help bolster demand for prod-
7 ucts and services produced on crewed or crew-tended
8 space stations.

9 “(b) NOTIFICATION TO CONGRESS.—On completion
10 of a determination made under paragraph (2), the Admin-
11 istrator shall submit to the appropriate committees of
12 Congress a notification of the determination that includes
13 a written justification.

14 “(c) PUBLIC AVAILABILITY.—A determination or
15 part of such determination under paragraph (1) shall be
16 made available to the public on request, as required under
17 section 552 of title 5, United States Code (commonly re-
18 ferred to as the ‘Freedom of Information Act’).

19 “(d) RULE OF CONSTRUCTION.—Nothing in this sec-
20 tion may be construed to affect the rights of the Federal
21 Government, including property rights in inventions,
22 under any contract, except in the case of a written con-
23 tract with the Administration or the ISS management en-
24 tity for the performance of a designated activity.

25 “(e) DEFINITIONS.—In this section—

1 “(1) CONTRACT.—The term ‘contract’ has the
2 meaning giving the term in section 20135(a).

3 “(2) DESIGNATED ACTIVITY.—The term ‘des-
4 ignated activity’ means any non-NASA scientific use
5 of the ISS national laboratory as described in sec-
6 tion 504 of the National Aeronautics and Space Ad-
7 ministration Authorization Act of 2010 (42 U.S.C.
8 18354).

9 “(3) DESIGNATED INVENTION.—The term ‘des-
10 ignated invention’ means any invention, product, or
11 service conceived or first reduced to practice by any
12 person in the performance of a designated activity
13 under a written contract with the Administration or
14 the ISS management entity.

15 “(4) FULL COST.—The term ‘full cost’ means
16 the cost of transporting materials or passengers to
17 and from the ISS, including any power needs, the
18 disposal of mass, crew member time, stowage, power
19 on the ISS, data downlink, crew consumables, and
20 life support.

21 “(5) GOVERNMENT-PURPOSE LICENSE.—The
22 term ‘Government-purpose license’ means the res-
23 ervation by the Federal Government of an irrev-
24 ocable, nonexclusive, nontransferable, royalty-free li-
25 cense for the use of an invention throughout the

1 world by or on behalf of the United States or any
 2 foreign government pursuant to a treaty or agree-
 3 ment with the United States.

4 “(6) ISS MANAGEMENT ENTITY.—The term
 5 ‘ISS management entity’ means the organization
 6 with which the Administrator enters into a coopera-
 7 tive agreement under section 504(a) of the National
 8 Aeronautics and Space Administration Authorization
 9 Act of 2010 (42 U.S.C. 18354(a)).

10 “(7) USER.—The term ‘user’ means a person,
 11 including a nonprofit organization or small business
 12 firm (as such terms are defined in section 201 of
 13 title 35), or class of persons that enters into a writ-
 14 ten contract with the Administration or the ISS
 15 management entity for the performance of des-
 16 ignated activities.”.

17 (b) CONFORMING AMENDMENT.—The table of sec-
 18 tions for chapter 201 of title 51, United States Code, is
 19 amended by inserting after the item relating to section
 20 20149 the following:

“20150. Property rights in designated inventions.”.

21 **SEC. 214. DATA FIRST PRODUCED DURING NON-NASA SCI-**
 22 **ENTIFIC USE OF THE ISS NATIONAL LABORA-**
 23 **TORY.**

24 (a) DATA RIGHTS.—Subchapter III of chapter 201
 25 of title 51, United States Code, as amended by section

1 213, is further amended by adding at the end the fol-
 2 lowing:

3 **“§ 20151. Data rights**

4 “(a) NON-NASA SCIENTIFIC USE OF THE ISS NA-
 5 TIONAL LABORATORY.—The Federal Government may not
 6 use or reproduce, or disclose outside of the Government,
 7 any data first produced in the performance of a designated
 8 activity under a written contract with the Administration
 9 or the ISS management entity, unless—

10 “(1) otherwise agreed under the terms of the
 11 contract with the Administration or the ISS man-
 12 agement entity, as applicable;

13 “(2) the designated activity is carried out with
 14 Federal funds;

15 “(3) disclosure is required by law;

16 “(4) the Federal Government has rights in the
 17 data under another Federal contract, grant, coopera-
 18 tive agreement, or other transaction; or

19 “(5) the data is—

20 “(A) otherwise lawfully acquired or inde-
 21 pendently developed by the Federal Govern-
 22 ment;

23 “(B) related to the health and safety of
 24 personnel on the ISS; or

1 “(C) essential to the performance of work
2 by the ISS management entity or NASA per-
3 sonnel.

4 “(b) DEFINITIONS.—In this section:

5 “(1) CONTRACT.—The term ‘contract’ has the
6 meaning given the term under section 20135(a).

7 “(2) DATA.—

8 “(A) IN GENERAL.—The term ‘data’
9 means recorded information, regardless of form
10 or the media on which it may be recorded.

11 “(B) INCLUSIONS.—The term ‘data’ in-
12 cludes technical data and computer software.

13 “(C) EXCLUSIONS.—The term ‘data’ does
14 not include information incidental to contract
15 administration, such as financial, administra-
16 tive, cost or pricing, or management informa-
17 tion.

18 “(3) DESIGNATED ACTIVITY.—The term ‘des-
19 ignated activity’ has the meaning given the term in
20 section 20150.

21 “(4) ISS MANAGEMENT ENTITY.—The term
22 ‘ISS management entity’ has the meaning given the
23 term in section 20150.”.

24 (b) SPECIAL HANDLING OF TRADE SECRETS OR
25 CONFIDENTIAL INFORMATION.—Section 20131(b)(2) of

1 title 51, United States Code, is amended to read as fol-
2 lows:

3 “(2) INFORMATION DESCRIBED.—

4 “(A) ACTIVITIES UNDER AGREEMENT.—
5 Information referred to in paragraph (1) is in-
6 formation that—

7 “(i) results from activities conducted
8 under an agreement entered into under
9 subsections (e) and (f) of section 20113;
10 and

11 “(ii) would be a trade secret or com-
12 mercial or financial information that is
13 privileged or confidential within the mean-
14 ing of section 552(b)(4) of title 5 if the in-
15 formation had been obtained from a non-
16 Federal party participating in such an
17 agreement.

18 “(B) CERTAIN DATA.—Information re-
19 ferred to in paragraph (1) includes data (as de-
20 fined in section 20151) that—

21 “(i) was first produced by the Admin-
22 istration in the performance of any des-
23 ignated activity (as defined in section
24 20150); and

1 “(ii) would be a trade secret or com-
 2 mercial or financial information that is
 3 privileged or confidential within the mean-
 4 ing of section 552(b)(4) of title 5 if the
 5 data had been obtained from a non-Fed-
 6 eral party.”.

7 (c) CONFORMING AMENDMENT.—The table of sec-
 8 tions for chapter 201 of title 51, United States Code, as
 9 amended by section 213, is further amended by inserting
 10 after the item relating to section 20150 the following:

“20151. Data rights.”.

11 **SEC. 215. PAYMENTS RECEIVED FOR COMMERCIAL SPACE-**
 12 **ENABLED PRODUCTION ON THE ISS.**

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

15 (1) the Administrator should determine a
 16 threshold for NASA to recover the costs of sup-
 17 porting the commercial development of products or
 18 services aboard the ISS, through the negotiation of
 19 agreements, similar to agreements made by other
 20 Federal agencies that support private sector innova-
 21 tion; and

22 (2) the amount of such costs that to be recov-
 23 ered or profits collected through such agreements
 24 should be applied by the Administrator through a
 25 tiered process, taking into consideration the relative

1 maturity and profitability of the applicable product
 2 or service.

3 (b) IN GENERAL.—Subchapter III of chapter 201 of
 4 title 51, United States Code, as amended by section 214,
 5 is further amended by adding at the end the following:

6 **“§ 20152. Payments received for commercial space-en-**
 7 **able production**

8 “(a) ANNUAL REVIEW.—

9 “(1) IN GENERAL.—Not later than one year
 10 after the date of the enactment of this section, and
 11 annually thereafter, the Administrator shall review
 12 the profitability of any partnership with a private
 13 entity under a contract in which the Adminis-
 14 trator—

15 “(A) permits the use of the ISS by such
 16 private entities to produce a commercial prod-
 17 uct or service; and

18 “(B) provides the total unreimbursed cost
 19 of a contribution by the Federal Government
 20 for the use of Federal facilities, equipment, ma-
 21 terials, proprietary information of the Federal
 22 Government, or services of a Federal employee
 23 during working hours, including the cost for the
 24 Administration to carry out its responsibilities
 25 under paragraphs (1) and (4) of section 504(d)

1 of the National Aeronautics and Space Admin-
2 istration Authorization Act of 2010 (42 U.S.C.
3 18354(d)).

4 “(2) NEGOTIATION OF REIMBURSEMENTS.—

5 Subject to the review described in paragraph (1), the
6 Administrator shall seek to enter into an agreement
7 to negotiate reimbursements for payments received,
8 or portions of profits created, by any mature, profit-
9 able private entity described in that paragraph, as
10 appropriate, through a tiered process that reflects
11 the profitability of the relevant product or service.

12 “(3) USE OF FUNDS.—Amounts received by the

13 Administrator in accordance with an agreement
14 under paragraph (2) shall be used by the Adminis-
15 trator in the following order of priority:

16 “(A) To defray the operating cost of the

17 ISS.

18 “(B) To develop, implement, or operate fu-

19 ture low-Earth orbit platforms or capabilities.

20 “(C) To develop, implement, or operate fu-

21 ture human deep space platforms or capabili-
22 ties.

23 “(D) Any other costs the Administrator

24 considers appropriate.

1 “(4) REPORT.—On completion of the first an-
2 nual review under paragraph (1), and annually
3 thereafter, the Administrator shall submit to the ap-
4 propriate committees of Congress a report that in-
5 cludes a description of the results of the annual re-
6 view, any agreement entered into under this section,
7 and the amounts recouped or obtained under any
8 such agreement.

9 “(b) LICENSING AND ASSIGNMENT OF INVEN-
10 TIONS.—Notwithstanding sections 3710a and 3710c of
11 title 15 and any other provision of law, after payment in
12 accordance with subsection (A)(i) of such section
13 3710c(a)(1)(A)(i) to the inventors who have directly as-
14 signed to the Federal Government their interests in an in-
15 vention under a written contract with the Administration
16 or the ISS management entity for the performance of a
17 designated activity, the balance of any royalty or other
18 payment received by the Administrator or the ISS man-
19 agement entity from licensing and assignment of such in-
20 vention shall be paid by the Administrator or the ISS
21 management entity, as applicable, to the Space Explo-
22 ration Fund.

23 “(c) SPACE EXPLORATION FUND.—

24 “(1) ESTABLISHMENT.—There is established in
25 the Treasury of the United States a fund, to be

1 known as the ‘Space Exploration Fund’ (referred to
 2 in this subsection as the ‘Fund’), to be administered
 3 by the Administrator.

4 “(2) USE OF FUND.—The Fund shall be avail-
 5 able to carry out activities described in subsection
 6 (a)(3).

7 “(3) DEPOSITS.—There shall be deposited in
 8 the Fund—

9 “(A) amounts appropriated to the Fund;

10 “(B) fees and royalties collected by the Ad-
 11 ministrator or the ISS management entity
 12 under subsections (a) and (b); and

13 “(C) donations or contributions designated
 14 to support authorized activities.

15 “(4) RULE OF CONSTRUCTION.—Amounts avail-
 16 able to the Administrator under this subsection shall
 17 be—

18 “(A) in addition to amounts otherwise
 19 made available for the purpose described in
 20 paragraph (2); and

21 “(B) available for a period of 5 years, to
 22 the extent and in the amounts provided in an-
 23 nual appropriation Acts.

24 “(d) DEFINITIONS.—

1 “(1) IN GENERAL.—In this section, any term
2 used in this section that is also used in section
3 20150 shall have the meaning given the term in that
4 section.

5 “(2) APPROPRIATE COMMITTEES OF CON-
6 GRESS.—The term ‘appropriate committees of Con-
7 gress’ means—

8 “(A) the Committee on Commerce,
9 Science, and Transportation and the Committee
10 on Appropriations of the Senate; and

11 “(B) the Committee on Science, Space,
12 and Technology and the Committee on Appro-
13 priations of the House of Representatives.”.

14 (c) CONFORMING AMENDMENT.—The table of sec-
15 tions for chapter 201 of title 51, United States Code, as
16 amended by section and 214, is further amended by insert-
17 ing after the item relating to section 20151 the following:

“20152. Payments received for commercial space-enabled production.”.

18 **SEC. 216. STEPPING STONE APPROACH TO EXPLORATION.**

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

21 **“§ 70504. Stepping stone approach to exploration**

22 “(a) IN GENERAL.—The Administrator, in sustain-
23 able steps, may conduct missions to intermediate destina-
24 tions, such as the Moon, in accordance with section
25 20302(b), and on a timetable determined by the avail-

1 ability of funding, in order to achieve the objective of
2 human exploration of Mars specified in section 202(b)(5)
3 of the National Aeronautics and Space Administration Au-
4 thorization Act of 2010 (42 U.S.C. 18312(b)(5)), if the
5 Administrator—

6 “(1) determines that each such mission dem-
7 onstrates or advances a technology or operational
8 concept that will enable human missions to Mars;
9 and

10 “(2) incorporates each such mission into the
11 human exploration roadmap under section 432 of
12 the National Aeronautics and Space Administration
13 Transition Authorization Act of 2017 (Public Law
14 115–10; 51 U.S.C. 20302 note).

15 “(b) CISLUNAR SPACE EXPLORATION ACTIVITIES.—
16 In conducting a mission under subsection (a), the Admin-
17 istrator shall—

18 “(1) use a combination of launches of the Space
19 Launch System and space transportation services
20 from United States commercial providers, as appro-
21 priate, for the mission;

22 “(2) plan for not fewer than 1 Space Launch
23 System launch annually beginning after the first
24 successful crewed launch of Orion on the Space
25 Launch System; and

1 “(3) establish an outpost in orbit around the
2 Moon that—

3 “(A) demonstrates technologies, systems,
4 and operational concepts directly applicable to
5 the space vehicle that will be used to transport
6 humans to Mars;

7 “(B) has the capability for periodic human
8 habitation; and

9 “(C) can function as a point of departure,
10 return, or staging for Administration or non-
11 governmental or international partner missions
12 to multiple locations on the lunar surface or
13 other destinations.

14 “(c) COST-EFFECTIVENESS.—To maximize the cost-
15 effectiveness of the long-term space exploration and utili-
16 zation activities of the United States, the Administrator
17 shall take all necessary steps, including engaging non-
18 governmental and international partners, to ensure that
19 activities in the Administration’s human space exploration
20 program are balanced in order to help meet the require-
21 ments of future exploration and utilization activities lead-
22 ing to human habitation on the surface of Mars.

23 “(d) COMPLETION.—Within budgetary consider-
24 ations, once an exploration-related project enters its devel-
25 opment phase, the Administrator shall seek, to the max-

1 imum extent practicable, to complete that project without
2 undue delay.

3 “(e) INTERNATIONAL PARTICIPATION.—To achieve
4 the goal of successfully conducting a crewed mission to
5 the surface of Mars, the Administrator shall invite the
6 partners in the ISS program and other nations, as appro-
7 priate, to participate in an international initiative under
8 the leadership of the United States.”.

9 (b) DEFINITION OF CISLUNAR SPACE.—Section
10 10101 of title 51, United States Code, is amended by add-
11 ing at the end the following:

12 “(3) CISLUNAR SPACE.—The term ‘cislunar
13 space’ means the region of space beyond low-Earth
14 orbit out to and including the region around the sur-
15 face of the Moon.”.

16 (c) TECHNICAL AND CONFORMING AMENDMENTS.—
17 Section 3 of the National Aeronautics and Space Adminis-
18 tration Authorization Act of 2010 (42 U.S.C. 18302) is
19 amended by striking paragraphs (2) and (3) and inserting
20 the following:

21 “(2) APPROPRIATE COMMITTEES OF CON-
22 GRESS.—The term ‘appropriate committees of Con-
23 gress’ means—

24 “(A) the Committee on Commerce,
25 Science, and Transportation of the Senate; and

1 “(B) the Committee on Science, Space,
2 and Technology of the House of Representa-
3 tives.

4 “(3) CISLUNAR SPACE.—The term ‘cislunar
5 space’ means the region of space beyond low-Earth
6 orbit out to and including the region around the sur-
7 face of the Moon.”.

8 **SEC. 217. TECHNICAL AMENDMENTS RELATING TO**
9 **ARTEMIS MISSIONS.**

10 (a) Section 421 of the National Aeronautics and
11 Space Administration Authorization Act of 2017 (Public
12 Law 115–10; 51 U.S.C. 20301 note) is amended—

13 (1) in subsection (c)(3)—

14 (A) by striking “EM–1” and inserting
15 “Artemis I”;

16 (B) by striking “EM–2” and inserting
17 “Artemis II”; and

18 (C) by striking “EM–3” and inserting
19 “Artemis III”; and

20 (2) in subsection (f)(3), by striking “EM–3”
21 and inserting “Artemis III”.

22 (b) Section 432(b) of the National Aeronautics and
23 Space Administration Authorization Act of 2017 (Public
24 Law 115–10; 51 U.S.C. 20302 note) is amended—

25 (1) in paragraph (3)(D)—

1 (A) by striking “EM–1” and inserting
 2 “Artemis I”; and

3 (B) by striking “EM–2” and inserting
 4 “Artemis II”; and

5 (2) in paragraph (4)(C), by striking “EM–3”
 6 and inserting “Artemis III”.

7 **TITLE III—SCIENCE**

8 **SEC. 301. SCIENCE PRIORITIES.**

9 (a) SENSE OF CONGRESS ON SCIENCE PORTFOLIO.—
 10 Congress reaffirms the sense of Congress that—

11 (1) a balanced and adequately funded set of ac-
 12 tivities, consisting of research and analysis grant
 13 programs, technology development, suborbital re-
 14 search activities, and small, medium, and large space
 15 missions, contributes to a robust and productive
 16 science program and serves as a catalyst for innova-
 17 tion and discovery; and

18 (2) the Administrator should set science prior-
 19 ities by following the guidance provided by the sci-
 20 entific community through the decadal surveys of
 21 the National Academies of Sciences, Engineering,
 22 and Medicine.

23 (b) NATIONAL ACADEMIES DECADAL SURVEYS.—
 24 Section 20305(c) of title 51, United States Code, is
 25 amended—

1 (1) by striking “The Administrator shall” and
2 inserting the following:

3 “(1) REEXAMINATION OF PRIORITIES BY NA-
4 TIONAL ACADEMIES.—The Administrator shall”; and

5 (2) by adding at the end the following:

6 “(2) REEXAMINATION OF PRIORITIES BY AD-
7 MINISTRATOR.—If the Administrator decides to reex-
8 amine the applicability of the priorities of the
9 decadal surveys to the missions and activities of the
10 Administration due to scientific discoveries or exter-
11 nal factors, the Administrator shall consult with the
12 relevant committees of the National Academies.”.

13 **SEC. 302. LUNAR DISCOVERY PROGRAM.**

14 (a) IN GENERAL.—The Administrator may carry out
15 a program to conduct lunar science research, including
16 missions to the surface of the Moon, that materially con-
17 tributes to the objective described in section 20102(d)(1)
18 of title 51, United States Code.

19 (b) COMMERCIAL LANDERS.—In carrying out the
20 program under subsection (a), the Administrator shall
21 procure the services of commercial landers developed pri-
22 marily by United States industry to land science payloads
23 of all classes on the lunar surface.

24 (c) LUNAR SCIENCE RESEARCH.—The Administrator
25 shall ensure that lunar science research carried out under

1 subsection (a) is consistent with recommendations made
2 by the National Academies of Sciences, Engineering, and
3 Medicine.

4 (d) LUNAR POLAR VOLATILES.—In carrying out the
5 program under subsection (a), the Administrator shall, at
6 the earliest opportunity, consider mission proposals to
7 evaluate the potential of lunar polar volatiles to contribute
8 to sustainable lunar exploration.

9 **SEC. 303. SEARCH FOR LIFE.**

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

12 (1) the report entitled “An Astrobiology Strat-
13 egy for the Search for Life in the Universe” pub-
14 lished by the National Academies of Sciences, Engi-
15 neering, and Medicine outlines the key scientific
16 questions and methods for fulfilling the objective of
17 NASA to search for the origin, evolution, distribu-
18 tion, and future of life in the universe; and

19 (2) the interaction of lifeforms with their envi-
20 ronment, a central focus of astrobiology research, is
21 a topic of broad significance to life sciences research
22 in space and on Earth.

23 (b) PROGRAM CONTINUATION.—

24 (1) IN GENERAL.—The Administrator shall con-
25 tinue to implement a collaborative, multidisciplinary

1 science and technology development program to
2 search for proof of the existence or historical exist-
3 ence of life beyond Earth in support of the objective
4 described in section 20102(d)(10) of title 51, United
5 States Code.

6 (2) ELEMENT.—The program under paragraph
7 (1) shall include activities relating to astronomy, bi-
8 ology, geology, and planetary science.

9 (3) COORDINATION WITH LIFE SCIENCES PRO-
10 GRAM.—In carrying out the program under para-
11 graph (1), the Administrator shall coordinate efforts
12 with the life sciences program of the Administration.

13 (4) TECHNOSIGNATURES.—In carrying out the
14 program under paragraph (1), the Administrator
15 shall support activities to search for and analyze
16 technosignatures.

17 (5) INSTRUMENTATION AND SENSOR TECH-
18 NOLOGY.—In carrying out the program under para-
19 graph (1), the Administrator may strategically invest
20 in the development of new instrumentation and sen-
21 sor technology.

22 **SEC. 304. JAMES WEBB SPACE TELESCOPE.**

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

1 (1) the James Webb Space Telescope will be
2 the next premier observatory in space and has great
3 potential to further scientific study and assist sci-
4 entists in making new discoveries in the field of as-
5 tronomy;

6 (2) the James Webb Space Telescope was devel-
7 oped as an ambitious project with a scope that was
8 not fully defined at inception and with risk that was
9 not fully known or understood;

10 (3) despite the major technology development
11 and innovation that was needed to construct the
12 James Webb Space Telescope, major negative im-
13 pacts to the cost and schedule of the James Webb
14 Space Telescope resulted from poor program man-
15 agement and poor contractor performance;

16 (4) the Administrator should take into account
17 the lessons learned from the cost and schedule issues
18 relating to the development of the James Webb
19 Space Telescope in making decisions regarding the
20 scope of and the technologies needed for future sci-
21 entific missions; and

22 (5) in selecting future scientific missions, the
23 Administrator should take into account the impact
24 that large programs that overrun cost and schedule

1 estimates may have on other NASA programs in
2 earlier phases of development.

3 (b) PROJECT CONTINUATION.—The Administrator
4 shall continue—

5 (1) to closely track the cost and schedule per-
6 formance of the James Webb Space Telescope
7 project; and

8 (2) to improve the reliability of cost estimates
9 and contractor performance data throughout the re-
10 maining development of the James Webb Space Tel-
11 escope.

12 (c) REVISED ESTIMATE.—Due to delays to the James
13 Webb Space Telescope project resulting from the COVID-
14 19 pandemic, the Administrator shall provide to Con-
15 gress—

16 (1) an estimate of any increase to program de-
17 velopment costs, if such costs are anticipated to ex-
18 ceed \$8,802,700,000; and

19 (2) an estimate for a revised launch date.

20 **SEC. 305. WIDE-FIELD INFRARED SURVEY TELESCOPE.**

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

23 (1) major growth in the cost of astrophysics
24 flagship-class missions has impacted the overall port-
25 folio balance of the Science Mission Directorate; and

1 (2) the Administrator should continue to de-
2 velop the Wide-Field Infrared Survey Telescope with
3 a development cost of not more than
4 \$3,200,000,000.

5 (b) PROJECT CONTINUATION.—The Administrator
6 shall continue to develop the Wide-Field Infrared Survey
7 Telescope to meet the objectives outlined in the 2010
8 decadal survey on astronomy and astrophysics of the Na-
9 tional Academies of Sciences, Engineering, and Medicine
10 in a manner that maximizes scientific productivity based
11 on the resources invested.

12 **SEC. 306. STUDY ON SATELLITE SERVICING FOR SCIENCE**
13 **MISSIONS.**

14 (a) IN GENERAL.—The Administrator shall conduct
15 a study on the feasibility of using in-space robotic refuel-
16 ing, repair, or refurbishment capabilities to extend the
17 useful life of telescopes and other science missions that
18 are operational or in development as of the date of the
19 enactment of this Act.

20 (b) ELEMENTS.—The study conducted under sub-
21 section (a) shall include the following:

22 (1) An identification of the technologies and in-
23 space testing required to demonstrate the in-space
24 robotic refueling, repair, or refurbishment capabili-
25 ties described in that subsection.

1 (2) The projected cost of using such capabili-
 2 ties, including the cost of extended operations for
 3 science missions described in that subsection.

4 (c) BRIEFING.—Not later than 1 year after the date
 5 of the enactment of this Act, the Administrator shall pro-
 6 vide to the appropriate committees of Congress a briefing
 7 on the results of the study conducted under subsection (a).

8 (d) PUBLIC AVAILABILITY.—Not later than 30 days
 9 after the Administrator provides the briefing under sub-
 10 section (c), the Administrator shall make the study con-
 11 ducted under subsection (a) available to the public.

12 **SEC. 307. EARTH SCIENCE MISSIONS AND PROGRAMS.**

13 (a) SENSE OF CONGRESS.—It is the sense of Con-
 14 gress that the Earth Science Division of NASA plays an
 15 important role in national efforts—

16 (1) to collect and use Earth observations in
 17 service to society; and

18 (2) to understand global change.

19 (b) EARTH SCIENCE MISSIONS AND PROGRAMS.—
 20 With respect to the missions and programs of the Earth
 21 Science Division, the Administrator shall, to the maximum
 22 extent practicable, follow the recommendations and guid-
 23 ance provided by the scientific community through the
 24 decadal survey for Earth science and applications from

1 space of the National Academies of Sciences, Engineering,
 2 and Medicine, including—

3 (1) the science priorities described in such sur-
 4 vey;

5 (2) the execution of the series of existing or
 6 previously planned observations (commonly known as
 7 the “program of record”); and

8 (3) the development of a range of missions of
 9 all classes, including opportunities for principal in-
 10 vestigator-led, competitively selected missions.

11 **SEC. 308. LIFE SCIENCE AND PHYSICAL SCIENCE RE-**
 12 **SEARCH.**

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

15 (1) the 2011 decadal survey on biological and
 16 physical sciences in space identifies—

17 (A) many areas in which fundamental sci-
 18 entific research is needed to efficiently advance
 19 the range of human activities in space, from the
 20 first stages of exploration to eventual economic
 21 development; and

22 (B) many areas of basic and applied sci-
 23 entific research that could use the microgravity,
 24 radiation, and other aspects of the spaceflight

1 environment to answer fundamental scientific
2 questions;

3 (2) given the central role of life science and
4 physical science research in developing the future of
5 space exploration, NASA should continue to invest
6 strategically in such research to maintain United
7 States leadership in space exploration; and

8 (3) such research remains important to the ob-
9 jectives of NASA with respect to long-duration deep
10 space human exploration to the Moon and Mars.

11 (b) PROGRAM CONTINUATION.—

12 (1) IN GENERAL.—In support of the goals de-
13 scribed in section 20302 of title 51, United States
14 Code, the Administrator shall continue to implement
15 a collaborative, multidisciplinary life science and
16 physical science fundamental research program—

17 (A) to build a scientific foundation for the
18 exploration and development of space;

19 (B) to investigate the mechanisms of
20 changes to biological systems and physical sys-
21 tems, and the environments of those systems in
22 space, including the effects of long-duration ex-
23 posure to deep space-related environmental fac-
24 tors on those systems;

(C) to understand the effects of combined deep space radiation and altered gravity levels on biological systems so as to inform the development and testing of potential countermeasures;

(D) to understand physical phenomena in reduced gravity that affect design and performance of enabling technologies necessary for the space exploration program;

(E) to provide scientific opportunities to educate, train, and develop the next generation of researchers and engineers; and

(F) to provide state-of-the-art data repositories and curation of large multi-data sets to enable comparative research analyses.

(2) ELEMENTS.—The program under paragraph (1) shall—

(A) include fundamental research relating to life science, space bioscience, and physical science; and

(B) maximize intra-agency and interagency partnerships to advance space exploration, scientific knowledge, and benefits to Earth.

(3) USE OF FACILITIES.—In carrying out the program under paragraph (1), the Administrator

1 may use ground-based, air-based, and space-based
2 facilities in low-Earth orbit and beyond low-Earth
3 orbit.

4 **SEC. 309. SCIENCE MISSIONS TO MARS.**

5 (a) IN GENERAL.—The Administrator shall conduct
6 1 or more science missions to Mars to enable the selection
7 of 1 or more sites for human landing.

8 (b) SAMPLE PROGRAM.—The Administrator may
9 carry out a program—

10 (1) to collect samples from the surface of Mars;

11 and

12 (2) to return such samples to Earth for sci-
13 entific analysis.

14 (c) USE OF EXISTING CAPABILITIES AND ASSETS.—
15 In carrying out this section, the Administrator shall, to
16 the maximum extent practicable, use existing capabilities
17 and assets of NASA centers.

18 **SEC. 310. PLANETARY DEFENSE COORDINATION OFFICE.**

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

21 (1) Near-Earth objects remain a threat to the
22 United States.

23 (2) Section 321(d)(1) of the National Aero-
24 nautics and Space Administration Authorization Act
25 of 2005 (Public Law 109–155; 119 Stat. 2922; 51

1 U.S.C. 71101 note prec.) established a requirement
2 that the Administrator plan, develop, and implement
3 a Near-Earth Object Survey program to detect,
4 track, catalogue, and characterize the physical char-
5 acteristics of near-Earth objects equal to or greater
6 than 140 meters in diameter in order to assess the
7 threat of such near-Earth objects to the Earth, with
8 the goal of 90-percent completion of the catalogue of
9 such near-Earth objects by December 30, 2020.

10 (3) The current planetary defense strategy of
11 NASA acknowledges that such goal will not be met.

12 (4) The report of the National Academies of
13 Sciences, Engineering, and Medicine entitled “Find-
14 ing Hazardous Asteroids Using Infrared and Visible
15 Wavelength Telescopes” issued in 2019 states
16 that—

17 (A) NASA cannot accomplish such goal
18 with currently available assets;

19 (B) NASA should develop and launch a
20 dedicated space-based infrared survey telescope
21 to meet the requirements of section 321(d)(1)
22 of the National Aeronautics and Space Admin-
23 istration Authorization Act of 2005 (Public
24 Law 109–155; 119 Stat. 2922; 51 U.S.C.
25 71101 note prec.); and

1 (C) the early detection of potentially haz-
2 arduous near-Earth objects enabled by a space-
3 based infrared survey telescope is important to
4 enable deflection of a dangerous asteroid.

5 (b) ESTABLISHMENT OF PLANETARY DEFENSE CO-
6 ORDINATION OFFICE.—

7 (1) IN GENERAL.—Not later than 90 days after
8 the date of the enactment of this Act, the Adminis-
9 trator shall establish an office within the Planetary
10 Science Division of the Science Mission Directorate,
11 to be known as the “Planetary Defense Coordination
12 Office”, to plan, develop, and implement a program
13 to survey threats posed by near-Earth objects equal
14 to or greater than 140 meters in diameter, as re-
15 quired by section 321(d)(1) of the National Aero-
16 nautics and Space Administration Authorization Act
17 of 2005 (Public Law 109–155; 119 Stat. 2922; 51
18 U.S.C. 71101 note prec.).

19 (2) ACTIVITIES.—The Administrator shall—

20 (A) develop and, not later than September
21 30, 2025, launch a space-based infrared survey
22 telescope that is capable of detecting near-
23 Earth objects equal to or greater than 140 me-
24 ters in diameter, with preference given to plan-
25 etary missions selected by the Administrator as

1 of the date of the enactment of this Act to pur-
2 sue concept design studies relating to the devel-
3 opment of a space-based infrared survey tele-
4 scope;

5 (B) identify, track, and characterize poten-
6 tially hazardous near-Earth objects and issue
7 warnings of the effects of potential impacts of
8 such objects; and

9 (C) assist in coordinating Government
10 planning for response to a potential impact of
11 a near-Earth object.

12 (c) ANNUAL REPORT.—Section 321(f) of the Na-
13 tional Aeronautics and Space Administration Authoriza-
14 tion Act of 2005 (Public Law 109–155; 119 Stat. 2922;
15 51 U.S.C. 71101 note prec.) is amended to read as fol-
16 lows:

17 “(f) ANNUAL REPORT.—Not later than 180 days
18 after the date of the enactment of the National Aero-
19 nautics and Space Administration Authorization Act of
20 2020, and annually thereafter through 90-percent comple-
21 tion of the catalogue required by subsection (d)(1), the
22 Administrator shall submit to the Committee on Com-
23 merce, Science, and Transportation of the Senate and the
24 Committee on Science, Space, and Technology of the

1 House of Representatives a report that includes the fol-
2 lowing:

3 “(1) A summary of all activities carried out by
4 the Planetary Defense Coordination Office estab-
5 lished under section 310(b)(1) of the National Aero-
6 nautics and Space Administration Authorization Act
7 of 2020 since the date of enactment of that Act.

8 “(2) A description of the progress with respect
9 to the design, development, and launch of the space-
10 based infrared survey telescope required by section
11 310(b)(2)(A) of the National Aeronautics and Space
12 Administration Authorization Act of 2020.

13 “(3) An assessment of the progress toward
14 meeting the requirements of subsection (d)(1).

15 “(4) A description of the status of efforts to co-
16 ordinate planetary defense activities in response to a
17 threat posed by a near-Earth object with other Fed-
18 eral agencies since the date of enactment of the Na-
19 tional Aeronautics and Space Administration Au-
20 thorization Act of 2020.

21 “(5) A description of the status of efforts to co-
22 ordinate and cooperate with other countries to dis-
23 cover hazardous asteroids and comets, plan a mitiga-
24 tion strategy, and implement that strategy in the

1 event of the discovery of an object on a likely colli-
2 sion course with Earth.

3 “(6) A summary of expenditures for all activi-
4 ties carried out by the Planetary Defense Coordina-
5 tion Office since the date of enactment of the Na-
6 tional Aeronautics and Space Administration Au-
7 thorization Act of 2020.”.

8 (d) LIMITATION ON USE OF FUNDS.—None of the
9 amounts authorized to be appropriated by this Act for a
10 fiscal year may be obligated or expended for the Office
11 of the Administrator during the last 3 months of that fis-
12 cal year unless the Administrator submits the report for
13 that fiscal year required by section 321(f) of the National
14 Aeronautics and Space Administration Authorization Act
15 of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C.
16 71101 note prec.).

17 (e) NEAR-EARTH OBJECT DEFINED.—In this sec-
18 tion, the term “near-Earth object” means an asteroid or
19 comet with a perihelion distance of less than 1.3 Astro-
20 nomical Units from the Sun.

21 **SEC. 311. SUBORBITAL SCIENCE FLIGHTS.**

22 (a) SENSE OF CONGRESS.—It is the sense of Con-
23 gress that commercially available suborbital flight plat-
24 forms enable low-cost access to a microgravity environ-
25 ment to advance science and train scientists and engineers

1 under the Suborbital Research Program established under
2 section 802(c) of the National Aeronautics and Space Ad-
3 ministration Authorization Act of 2010 (42 U.S.C.
4 18382(c)).

5 (b) REPORT.—

6 (1) IN GENERAL.—Not later than 270 days
7 after the date of the enactment of this Act, the Ad-
8 ministrator shall submit to the appropriate commit-
9 tees of Congress a report evaluating the manner in
10 which suborbital flight platforms can contribute to
11 meeting the science objectives of NASA for the
12 Science Mission Directorate and the Human Explo-
13 ration and Operations Mission Directorate.

14 (2) CONTENTS.—The report required by para-
15 graph (1) shall include the following:

16 (A) An assessment of the advantages of
17 suborbital flight platforms to meet science ob-
18 jectives.

19 (B) An evaluation of the challenges to
20 greater use of commercial suborbital flight plat-
21 forms for science purposes.

22 (C) An analysis of whether commercial
23 suborbital flight platforms can provide low-cost
24 flight opportunities to test lunar and Mars
25 science payloads.

1 **SEC. 312. EARTH SCIENCE DATA AND OBSERVATIONS.**

2 (a) IN GENERAL.—The Administrator shall to the
3 maximum extent practicable, make available to the public
4 in an easily accessible electronic database all data (includ-
5 ing metadata, documentation, models, data processing
6 methods, images, and research results) of the missions
7 and programs of the Earth Science Division of the Admin-
8 istration, or any successor division.

9 (b) OPEN DATA PROGRAM.—In carrying out sub-
10 section (a), the Administrator shall establish and continue
11 to operate an open data program that—

12 (1) is consistent with the greatest degree of
13 interactivity, interoperability, and accessibility; and

14 (2) enables outside communities, including the
15 research and applications community, private indus-
16 try, academia, and the general public, to effectively
17 collaborate in areas important to—

18 (A) studying the Earth system and improv-
19 ing the prediction of Earth system change; and

20 (B) improving model development, data as-
21 simulation techniques, systems architecture inte-
22 gration, and computational efficiencies; and

23 (3) meets basic end-user requirements for run-
24 ning on public computers and networks located out-
25 side of secure Administration information and tech-
26 nology systems.

1 (c) HOSTING.—The program under subsection (b)
 2 shall use, as appropriate and cost-effective, innovative
 3 strategies and methods for hosting and management of
 4 part or all of the program, including cloud-based com-
 5 puting capabilities.

6 (d) RULE OF CONSTRUCTION.—Nothing in this sec-
 7 tion shall be interpreted to require the Administrator to
 8 release classified, proprietary, or otherwise restricted in-
 9 formation that would be harmful to the national security
 10 of the United States.

11 **SEC. 313. SENSE OF CONGRESS ON SMALL SATELLITE**
 12 **SCIENCE.**

13 It is the sense of Congress that—

14 (1) small satellites—

15 (A) are increasingly robust, effective, and
 16 affordable platforms for carrying out space
 17 science missions;

18 (B) can work in tandem with or augment
 19 larger NASA spacecraft to support high-priority
 20 science missions of NASA; and

21 (C) are cost effective solutions that may
 22 allow NASA to continue collecting legacy obser-
 23 vations while developing next-generation science
 24 missions; and

(2) NASA should continue to support small satellite research, development, technologies, and programs, including technologies for compact and lightweight instrumentation for small satellites.

SEC. 314. SENSE OF CONGRESS ON COMMERCIAL SPACE SERVICES.

It is the sense of Congress that—

(1) the Administration should explore partnerships with the commercial space industry for space science missions in and beyond Earth orbit, including partnerships relating to payload and instrument hosting and commercially available datasets; and

(2) such partnerships could result in increased mission cadence, technology advancement, and cost savings for the Administration.

SEC. 315. PROCEDURES FOR IDENTIFYING AND ADDRESSING ALLEGED VIOLATIONS OF SCIENTIFIC INTEGRITY POLICY.

Not later than 180 days after the date of the enactment of this Act, the Administrator shall develop and document procedures for identifying and addressing alleged violations of the scientific integrity policy of NASA.

1 **TITLE IV—AERONAUTICS**

2 **SEC. 401. SHORT TITLE.**

3 This title may be cited as the “Aeronautics Innova-
4 tion Act”.

5 **SEC. 402. DEFINITIONS.**

6 In this title:

7 (1) AERONAUTICS STRATEGIC IMPLEMENTA-
8 TION PLAN.—The term “Aeronautics Strategic Im-
9 plementation Plan” means the Aeronautics Strategic
10 Implementation Plan issued by the Aeronautics Re-
11 search Mission Directorate.

12 (2) UNMANNED AIRCRAFT; UNMANNED AIR-
13 CRAFT SYSTEM.—The terms “unmanned aircraft”
14 and “unmanned aircraft system” have the meanings
15 given those terms in section 44801 of title 49,
16 United States Code.

17 (3) X-PLANE.—The term “X-plane” means an
18 experimental aircraft that is—

19 (A) used to test and evaluate a new tech-
20 nology or aerodynamic concept; and

21 (B) operated by NASA or the Department
22 of Defense.

23 **SEC. 403. EXPERIMENTAL AIRCRAFT PROJECTS.**

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

1 (1) developing high-risk, precompetitive aero-
2 space technologies for which there is not yet a profit
3 rationale is a fundamental role of NASA;

4 (2) large-scale piloted flight test experimen-
5 tation and validation are necessary for—

6 (A) transitioning new technologies and ma-
7 terials, including associated manufacturing
8 processes, for general aviation, commercial avia-
9 tion, and military aeronautics use; and

10 (B) capturing the full extent of benefits
11 from investments made by the Aeronautics Re-
12 search Mission Directorate in priority programs
13 called for in—

14 (i) the National Aeronautics Research
15 and Development Plan issued by the Na-
16 tional Science and Technology Council in
17 February 2010;

18 (ii) the NASA 2014 Strategic Plan;

19 (iii) the Aeronautics Strategic Imple-
20 mentation Plan; and

21 (iv) any updates to the programs
22 called for in the plans described in clauses

23 (i) through (iii);

24 (3) a level of funding that adequately supports
25 large-scale piloted flight test experimentation and

validation, including related infrastructure, should be ensured over a sustained period of time to restore the capacity of NASA—

(A) to see legacy priority programs through to completion; and

(B) to achieve national economic and security objectives; and

(4) NASA should not be directly involved in the Type Certification of aircraft for current and future scheduled commercial air service under part 121 or 135 of title 14, Code of Federal Regulations, that would result in reductions in crew augmentation or single pilot or autonomously operated aircraft.

(b) STATEMENT OF POLICY.—It is the policy of the United States—

(1) to maintain world leadership in—

(A) military and civilian aeronautical science and technology;

(B) global air power projection; and

(C) aerospace industrialization; and

(2) to maintain as a fundamental objective of NASA aeronautics research the steady progression and expansion of flight research and capabilities, including the science and technology of critical underlying disciplines and competencies, such as—

- 1 (A) computational-based analytical and
- 2 predictive tools and methodologies;
- 3 (B) aerothermodynamics;
- 4 (C) propulsion;
- 5 (D) advanced materials and manufacturing
- 6 processes;
- 7 (E) high-temperature structures and mate-
- 8 rials; and
- 9 (F) guidance, navigation, and flight con-
- 10 trols.

11 (c) ESTABLISHMENT AND CONTINUATION OF X-

12 PLANE PROJECTS.—

13 (1) IN GENERAL.—The Administrator shall es-

14 tablish or continue to implement, in a manner that

15 is consistent with the roadmap for supersonic aero-

16 nautics research and development required by sec-

17 tion 604(b) of the National Aeronautics and Space

18 Administration Transition Authorization Act of

19 2017 (Public Law 115–10; 131 Stat. 55), the fol-

20 lowing projects:

- 21 (A) A low-boom supersonic aircraft project
- 22 to demonstrate supersonic aircraft designs and
- 23 technologies that—
- 24 (i) reduce sonic boom noise; and

(ii) assist the Administrator of the Federal Aviation Administration in enabling—

(I) the safe commercial deployment of civil supersonic aircraft technology; and

(II) the safe and efficient operation of civil supersonic aircraft.

(B) A subsonic flight demonstrator aircraft project to advance high-aspect-ratio, thin-wing aircraft designs and to integrate propulsion, composites, and other technologies that enable significant increases in energy efficiency and reduced life-cycle emissions in the aviation system while reducing noise and emissions.

(C) A series of large-scale X-plane demonstrators that are—

(i) developed sequentially or in parallel; and

(ii) each based on a set of new configuration concepts or technologies determined by the Administrator to demonstrate—

(I) aircraft and propulsion concepts and technologies and related ad-

1 vances in alternative propulsion and
2 energy; and

3 (II) flight propulsion concepts
4 and technologies.

5 (2) ELEMENTS.—For each project under para-
6 graph (1), the Administrator shall—

7 (A) include the development of X-planes
8 and all necessary supporting flight test assets;

9 (B) pursue a robust technology maturation
10 and flight test validation effort;

11 (C) improve necessary facilities, flight test-
12 ing capabilities, and computational tools to sup-
13 port the project;

14 (D) award any primary contracts for de-
15 sign, procurement, and manufacturing to
16 United States persons, consistent with inter-
17 national obligations and commitments;

18 (E) coordinate research and flight test
19 demonstration activities with other Federal
20 agencies and the United States aviation com-
21 munity, as the Administrator considers appro-
22 priate; and

23 (F) ensure that the project is aligned with
24 the Aeronautics Strategic Implementation Plan

1 and any updates to the Aeronautics Strategic
2 Implementation Plan.

3 (3) UNITED STATES PERSON DEFINED.—In this
4 subsection, the term “United States person”
5 means—

6 (A) a United States citizen or an alien law-
7 fully admitted for permanent residence to the
8 United States; or

9 (B) an entity organized under the laws of
10 the United States or of any jurisdiction within
11 the United States, including a foreign branch of
12 such an entity.

13 (d) ADVANCED MATERIALS AND MANUFACTURING
14 TECHNOLOGY PROGRAM.—

15 (1) IN GENERAL.—The Administrator may es-
16 tablish an advanced materials and manufacturing
17 technology program—

18 (A) to develop—

19 (i) new materials, including composite
20 and high-temperature materials, from base
21 material formulation through full-scale
22 structural validation and manufacture;

23 (ii) advanced materials and manufac-
24 turing processes, including additive manu-
25 facturing, to reduce the cost of manufac-

turing scale-up and certification for use in general aviation, commercial aviation, and military aeronautics; and

(iii) noninvasive or nondestructive techniques for testing or evaluating aviation and aeronautics structures, including for materials and manufacturing processes;

(B) to reduce the time it takes to design, industrialize, and certify advanced materials and manufacturing processes;

(C) to provide education and training opportunities for the aerospace workforce; and

(D) to address global cost and human capital competitiveness for United States aeronautical industries and technological leadership in advanced materials and manufacturing technology.

(2) ELEMENTS.—In carrying out a program under paragraph (1), the Administrator shall—

(A) build on work that was carried out by the Advanced Composites Project of NASA;

(B) partner with the private and academic sectors, such as members of the Advanced Composites Consortium of NASA, the Joint Advanced Materials and Structures Center of Ex-

1 cellence of the Federal Aviation Administration,
2 the Manufacturing USA institutes of the De-
3 partment of Commerce, and national labora-
4 tories, as the Administrator considers appro-
5 priate;

6 (C) provide a structure for managing intel-
7 lectual property generated by the program
8 based on or consistent with the structure estab-
9 lished for the Advanced Composites Consortium
10 of NASA;

11 (D) ensure adequate Federal cost share for
12 applicable research; and

13 (E) coordinate with advanced manufac-
14 turing and composites initiatives in other mis-
15 sion directorates of NASA, as the Adminis-
16 trator considers appropriate.

17 (e) RESEARCH PARTNERSHIPS.—In carrying out the
18 projects under subsection (c) and a program under sub-
19 section (d), the Administrator may engage in cooperative
20 research programs with—

21 (1) academia; and

22 (2) commercial aviation and aerospace manu-
23 facturers.

1 **SEC. 404. UNMANNED AIRCRAFT SYSTEMS.**

2 (a) UNMANNED AIRCRAFT SYSTEMS OPERATION
3 PROGRAM.—The Administrator shall—

4 (1) research and test capabilities and concepts,
5 including unmanned aircraft systems communica-
6 tions, for integrating unmanned aircraft systems
7 into the national airspace system;

8 (2) leverage the partnership NASA has with in-
9 dustry focused on the advancement of technologies
10 for future air traffic management systems for un-
11 manned aircraft systems; and

12 (3) continue to align the research and testing
13 portfolio of NASA to inform the integration of un-
14 manned aircraft systems into the national airspace
15 system, consistent with public safety and national
16 security objectives.

17 (b) SENSE OF CONGRESS ON COORDINATION WITH
18 FEDERAL AVIATION ADMINISTRATION.—It is the sense of
19 Congress that—

20 (1) NASA should continue—

21 (A) to coordinate with the Federal Avia-
22 tion Administration on research on air traffic
23 management systems for unmanned aircraft
24 systems; and

25 (B) to assist the Federal Aviation Admin-
26 istration in the integration of air traffic man-

1 agement systems for unmanned aircraft sys-
2 tems into the national airspace system; and

3 (2) the test ranges (as defined in section 44801
4 of title 49, United States Code) should continue to
5 be leveraged for research on—

6 (A) air traffic management systems for un-
7 manned aircraft systems; and

8 (B) the integration of such systems into
9 the national airspace system.

10 **SEC. 405. 21ST CENTURY AERONAUTICS CAPABILITIES INI-**
11 **TIATIVE.**

12 (a) IN GENERAL.—The Administrator may establish
13 an initiative, to be known as the “21st Century Aero-
14 nautics Capabilities Initiative”, within the Construction
15 and Environmental Compliance and Restoration Account,
16 to ensure that NASA possesses the infrastructure and ca-
17 pabilities necessary to conduct proposed flight demonstra-
18 tion projects across the range of NASA aeronautics inter-
19 ests.

20 (b) ACTIVITIES.—In carrying out the 21st Century
21 Aeronautics Capabilities Initiative, the Administrator may
22 carry out the following activities:

23 (1) Any investments the Administrator con-
24 siders necessary to upgrade and create facilities for

1 civil and national security aeronautics research to
2 support advancements in—

3 (A) long-term foundational science and
4 technology;

5 (B) advanced aircraft systems;

6 (C) air traffic management systems;

7 (D) fuel efficiency;

8 (E) electric propulsion technologies;

9 (F) system-wide safety assurance;

10 (G) autonomous aviation; and

11 (H) supersonic and hypersonic aircraft de-
12 sign and development.

13 (2) Any measures the Administrator considers
14 necessary to support flight testing activities, includ-
15 ing—

16 (A) continuous refinement and develop-
17 ment of free-flight test techniques and meth-
18 odologies;

19 (B) upgrades and improvements to real-
20 time tracking and data acquisition; and

21 (C) such other measures relating to aero-
22 nautics research support and modernization as
23 the Administrator considers appropriate to
24 carry out the scientific study of the problems of

1 flight, with a view to practical solutions for
2 such problems.

3 **SEC. 406. SENSE OF CONGRESS ON ON-DEMAND AIR TRANS-**
4 **PORTATION.**

5 It is the sense of Congress that—

6 (1) greater use of high-speed air transportation,
7 small airports, helipads, vertical flight infrastruc-
8 ture, and other aviation-related infrastructure can
9 alleviate surface transportation congestion and sup-
10 port economic growth within cities;

11 (2) with respect to urban air mobility and re-
12 lated concepts, NASA should continue—

13 (A) to conduct research focused on con-
14 cepts, technologies, and design tools; and

15 (B) to support the evaluation of advanced
16 technologies and operational concepts that can
17 be leveraged by—

18 (i) industry to develop future vehicles
19 and systems; and

20 (ii) the Federal Aviation Administra-
21 tion to support vehicle safety and oper-
22 ational certification; and

23 (3) NASA should leverage ongoing efforts to
24 develop advanced technologies to actively support the
25 research needed for on-demand air transportation.

1 **SEC. 407. SENSE OF CONGRESS ON HYPERSONIC TECH-**
2 **NOLOGY RESEARCH.**

3 It is the sense of Congress that—

4 (1) hypersonic technology is critical to the de-
5 velopment of advanced high-speed aerospace vehicles
6 for both civilian and national security purposes;

7 (2) for hypersonic vehicles to be realized, re-
8 search is needed to overcome technical challenges,
9 including in propulsion, advanced materials, and
10 flight performance in a severe environment;

11 (3) NASA plays a critical role in supporting
12 fundamental hypersonic research focused on system
13 design, analysis and validation, and propulsion tech-
14 nologies;

15 (4) NASA research efforts in hypersonic tech-
16 nology should complement research supported by the
17 Department of Defense to the maximum extent
18 practicable, since contributions from both agencies
19 working in partnership with universities and indus-
20 try are necessary to overcome key technical chal-
21 lenges;

22 (5) previous coordinated research programs be-
23 tween NASA and the Department of Defense en-
24 abled important progress on hypersonic technology;

25 (6) the commercial sector could provide flight
26 platforms and other capabilities that are able to host

1 and support NASA hypersonic technology research
2 projects; and

3 (7) in carrying out hypersonic technology re-
4 search projects, the Administrator should—

5 (A) focus research and development efforts
6 on high-speed propulsion systems, reusable ve-
7 hicle technologies, high-temperature materials,
8 and systems analysis;

9 (B) coordinate with the Department of De-
10 fense to prevent duplication of efforts and of in-
11 vestments;

12 (C) include partnerships with universities
13 and industry to accomplish research goals; and

14 (D) maximize public-private use of com-
15 mercially available platforms for hosting re-
16 search and development flight projects.

17 **TITLE V—SPACE TECHNOLOGY**

18 **SEC. 501. SPACE TECHNOLOGY MISSION DIRECTORATE.**

19 (a) SENSE OF CONGRESS.—It is the sense of Con-
20 gress that an independent Space Technology Mission Di-
21 rectorate is critical to ensuring continued investments in
22 the development of technologies for missions across the
23 portfolio of NASA, including science, aeronautics, and
24 human exploration.

1 (b) SPACE TECHNOLOGY MISSION DIRECTORATE.—
 2 The Administrator shall maintain a Space Technology
 3 Mission Directorate consistent with section 702 of the Na-
 4 tional Aeronautics and Space Administration Transition
 5 Authorization Act of 2017 (51 U.S.C. 20301 note).

6 **SEC. 502. FLIGHT OPPORTUNITIES PROGRAM.**

7 (a) SENSE OF CONGRESS.—It is the sense of Con-
 8 gress that the Administrator should provide flight oppor-
 9 tunities for payloads to microgravity environments and
 10 suborbital altitudes as required by section 907(c) of the
 11 National Aeronautics and Space Administration Author-
 12 ization Act of 2010 (42 U.S.C. 18405(c)), as amended by
 13 subsection (b).

14 (b) ESTABLISHMENT.—Section 907(c) of the Na-
 15 tional Aeronautics and Space Administration Authoriza-
 16 tion Act of 2010 (42 U.S.C. 18405(c)) is amended to read
 17 as follows:

18 “(c) ESTABLISHMENT.—

19 “(1) IN GENERAL.—The Administrator shall es-
 20 tablish a Commercial Reusable Suborbital Research
 21 Program within the Space Technology Mission Di-
 22 rectorate to fund—

23 “(A) the development of payloads for sci-
 24 entific research, technology development, and
 25 education;

1 “(B) flight opportunities for those pay-
2 loads to microgravity environments and sub-
3 orbital altitudes; and

4 “(C) transition of those payloads to orbital
5 opportunities.

6 “(2) COMMERCIAL REUSABLE VEHICLE
7 FLIGHTS.—In carrying out the Commercial Reusable
8 Suborbital Research Program, the Administrator
9 may fund engineering and integration demonstra-
10 tions, proofs of concept, and educational experiments
11 for flights of commercial reusable vehicles.

12 “(3) COMMERCIAL SUBORBITAL LAUNCH VEHI-
13 CLES.—In carrying out the Commercial Reusable
14 Suborbital Research Program, the Administrator
15 may not fund the development of new commercial
16 suborbital launch vehicles.

17 “(4) WORKING WITH MISSION DIREC-
18 TORATES.—In carrying out the Commercial Reus-
19 able Suborbital Research Program, the Adminis-
20 trator shall work with the mission directorates of
21 NASA to achieve the research, technology, and edu-
22 cation goals of NASA.”.

23 (c) CONFORMING AMENDMENT.—Section 907(b) of
24 the National Aeronautics and Space Administration Au-
25 thorization Act of 2010 (42 U.S.C. 18405(b)) is amended,

1 in the first sentence, by striking “Commercial Reusable
2 Suborbital Research Program in” and inserting “Commer-
3 cial Reusable Suborbital Research Program established
4 under subsection (c)(1) within”.

5 **SEC. 503. SMALL SPACECRAFT TECHNOLOGY PROGRAM.**

6 (a) SENSE OF CONGRESS.—It is the sense of Con-
7 gress that the Small Spacecraft Technology Program is
8 important for conducting science and technology valida-
9 tion for—

- 10 (1) short- and long-duration missions in low-
11 Earth orbit;
12 (2) deep space missions; and
13 (3) deorbiting capabilities designed specifically
14 for smaller spacecraft.

15 (b) ACCOMMODATION OF CERTAIN PAYLOADS.—In
16 carrying out the Small Spacecraft Technology Program,
17 the Administrator shall, as the mission risk posture and
18 technology development objectives allow, accommodate
19 science payloads that further the goal of long-term human
20 exploration to the Moon and Mars.

21 **SEC. 504. NUCLEAR PROPULSION TECHNOLOGY.**

22 (a) SENSE OF CONGRESS.—It is the sense of Con-
23 gress that nuclear propulsion is critical to the development
24 of advanced spacecraft for civilian and national defense
25 purposes.

1 (b) DEVELOPMENT; STUDIES.—The Administrator
 2 shall, in coordination with the Secretary of Energy and
 3 the Secretary of Defense—

4 (1) continue to develop the fuel element design
 5 for NASA nuclear propulsion technology;

6 (2) undertake the systems feasibility studies for
 7 such technology; and

8 (3) partner with members of commercial indus-
 9 try to conduct studies on such technology.

10 (c) NUCLEAR PROPULSION TECHNOLOGY DEM-
 11 ONSTRATION.—

12 (1) DETERMINATION; REPORT.—Not later than
 13 December 31, 2021, the Administrator shall—

14 (A) determine the correct approach for
 15 conducting a flight demonstration of nuclear
 16 propulsion technology; and

17 (B) submit to Congress a report on a plan
 18 for such a demonstration.

19 (2) DEMONSTRATION.—Not later than Decem-
 20 ber 31, 2026, the Administrator shall conduct the
 21 flight demonstration described in paragraph (1).

22 **SEC. 505. MARS-FORWARD TECHNOLOGIES.**

23 (a) SENSE OF CONGRESS.—It is the sense of Con-
 24 gress that the Administrator should pursue multiple tech-
 25 nical paths for entry, descent, and landing for Mars, in-

cluding competitively selected technology demonstration missions.

(b) **PRIORITIZATION OF LONG-LEAD TECHNOLOGIES AND SYSTEMS.**—The Administrator shall prioritize, within the Space Technology Mission Directorate, research, testing, and development of long-lead technologies and systems for Mars, including technologies and systems relating to—

(1) entry, descent, and landing; and

(2) in-space propulsion, including nuclear propulsion, cryogenic fluid management, in-situ large-scale additive manufacturing, and electric propulsion (including solar electric propulsion leveraging lessons learned from the power and propulsion element of the lunar outpost) options.

(c) **TECHNOLOGY DEMONSTRATION.**—The Administrator may use low-Earth orbit and cis-lunar missions, including missions to the lunar surface, to demonstrate technologies for Mars.

SEC. 506. PRIORITIZATION OF LOW-ENRICHED URANIUM TECHNOLOGY.

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

(1) space technology, including nuclear propulsion technology and space surface power reactors,

1 should be developed in a manner consistent with
2 broader United States foreign policy, national de-
3 fense, and space exploration and commercialization
4 priorities;

5 (2) highly enriched uranium presents security
6 and nuclear nonproliferation concerns;

7 (3) since 1977, based on the concerns associ-
8 ated with highly enriched uranium, the United
9 States has promoted the use of low-enriched ura-
10 nium over highly enriched uranium in nonmilitary
11 contexts, including research and commercial applica-
12 tions;

13 (4) as part of United States efforts to limit
14 international use of highly enriched uranium, the
15 United States has actively pursued—

16 (A) since 1978, the conversion of domestic
17 and foreign research reactors that use highly
18 enriched uranium fuel to low-enriched uranium
19 fuel and the avoidance of any new research re-
20 actors that use highly enriched uranium fuel;
21 and

22 (B) since 1994, the elimination of inter-
23 national commerce in highly enriched uranium
24 for civilian purposes; and

1 (5) the use of low-enriched uranium in place of
2 highly enriched uranium has security, nonprolifera-
3 tion, and economic benefits, including for the na-
4 tional space program.

5 (b) PRIORITIZATION OF LOW-ENRICHED URANIUM
6 TECHNOLOGY.—The Administrator shall—

7 (1) establish, within the Space Technology Mis-
8 sion Directorate, a program for the research, test-
9 ing, and development of in-space reactor designs, in-
10 cluding a surface power reactor, that uses low-en-
11 riched uranium fuel; and

12 (2) prioritize the research, demonstration, and
13 deployment of such designs over designs using highly
14 enriched uranium fuel.

15 (c) REPORT ON NUCLEAR TECHNOLOGY
16 PRIORITIZATION.—Not later than 120 days after the date
17 of the enactment of this Act, the Administrator shall sub-
18 mit to the appropriate committees of Congress a report
19 that—

20 (1) details the actions taken to implement sub-
21 section (b); and

22 (2) identifies a plan and timeline under which
23 such subsection will be implemented.

24 (d) DEFINITIONS.—In this section:

1 (1) HIGHLY ENRICHED URANIUM.—The term
 2 “highly enriched uranium” means uranium having
 3 an assay of 20 percent or greater of the uranium-
 4 235 isotope.

5 (2) LOW-ENRICHED URANIUM.—The term “low-
 6 enriched uranium” means uranium having an assay
 7 greater than the assay for natural uranium but less
 8 than 20 percent of the uranium-235 isotope.

9 **SEC. 507. SENSE OF CONGRESS ON NEXT-GENERATION**
 10 **COMMUNICATIONS TECHNOLOGY.**

11 It is the sense of Congress that—

12 (1) optical communications technologies—

13 (A) will be critical to the development of
 14 next-generation space-based communications
 15 networks;

16 (B) have the potential to allow NASA to
 17 expand the volume of data transmissions in low-
 18 Earth orbit and deep space; and

19 (C) may provide more secure and cost-ef-
 20 fective solutions than current radio frequency
 21 communications systems;

22 (2) quantum encryption technology has prom-
 23 ising implications for the security of the satellite and
 24 terrestrial communications networks of the United
 25 States, including optical communications networks,

1 and further research and development by NASA
2 with respect to quantum encryption is essential to
3 maintaining the security of the United States and
4 United States leadership in space; and

5 (3) in order to provide NASA with more secure
6 and reliable space-based communications, the Space
7 Communications and Navigation program office of
8 NASA should continue—

9 (A) to support research on and develop-
10 ment of optical communications; and

11 (B) to develop quantum encryption capa-
12 bilities, especially as those capabilities apply to
13 optical communications networks.

14 **SEC. 508. LUNAR SURFACE TECHNOLOGIES.**

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

17 (1) identify and develop the technologies needed
18 to live on and explore the lunar surface and prepare
19 for future operations on Mars;

20 (2) convene teams of experts from academia, in-
21 dustry, and government to shape the technology de-
22 velopment priorities of the Administration for lunar
23 surface exploration and habitation; and

24 (3) establish partnerships with researchers, uni-
25 versities, and the private sector to rapidly develop

1 and deploy technologies required for successful lunar
2 surface exploration.

3 (b) DEVELOPMENT AND DEMONSTRATION.—The Ad-
4 ministrators shall carry out a program, within the Space
5 Technology Mission Directorate, to conduct technology de-
6 velopment and demonstrations to enable human and
7 robotic exploration on the lunar surface.

8 (c) RESEARCH CONSORTIUM.—The Administrator
9 shall establish a consortium consisting of experts from
10 academia, industry, and government—

11 (1) to assist the Administrator in developing a
12 cohesive, executable strategy for the development
13 and deployment of technologies required for success-
14 ful lunar surface exploration; and

15 (2) to identify specific technologies relating to
16 lunar surface exploration that—

17 (A) should be developed to facilitate such
18 exploration; or

19 (B) require future research and develop-
20 ment.

21 (d) RESEARCH AWARDS.—

22 (1) IN GENERAL.—The Administrator may task
23 any member of the research consortium established
24 under subsection (c) with conducting research and

development with respect to a technology identified under paragraph (2) of that subsection.

(2) STANDARD PROCESS FOR ARRANGEMENTS.—

(A) IN GENERAL.—The Administrator shall develop a standard process by which a consortium member tasked with research and development under paragraph (1) may enter into a formal arrangement with the Administrator to carry out such research and development, such as an arrangement under section 702 or 703.

(B) REPORT.—Not later than 120 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the one or more types of arrangement the Administrator intends to enter into under this subsection.

TITLE VI—STEM ENGAGEMENT

SEC. 601. SENSE OF CONGRESS.

It is the sense of Congress that—

(1) NASA serves as a source of inspiration to the people of the United States; and

(2) NASA is uniquely positioned to help increase student interest in science, technology, engineering, and math;

(3) engaging students, and providing hands-on experience at an early age, in science, technology, engineering, and math are important aspects of ensuring and promoting United States leadership in innovation; and

(4) NASA should strive to leverage its unique position—

(A) to increase kindergarten through grade 12 involvement in NASA projects;

(B) to enhance higher education in STEM fields in the United States;

(C) to support individuals who are underrepresented in science, technology, engineering, and math fields, such as women, minorities, and individuals in rural areas; and

(D) to provide flight opportunities for student experiments and investigations.

SEC. 602. STEM EDUCATION ENGAGEMENT ACTIVITIES.

(a) IN GENERAL.—The Administrator shall continue to provide opportunities for formal and informal STEM education engagement activities within the Office of

1 NASA STEM Engagement and other NASA directorates,
2 including—

3 (1) the Established Program to Stimulate Com-
4 petitive Research;

5 (2) the Minority University Research and Edu-
6 cation Project; and

7 (3) the National Space Grant College and Fel-
8 lowship Program.

9 (b) LEVERAGING NASA NATIONAL PROGRAMS TO
10 PROMOTE STEM EDUCATION.—The Administrator, in
11 partnership with museums, nonprofit organizations, and
12 commercial entities, shall, to the maximum extent prac-
13 ticable, leverage human spaceflight missions, Deep Space
14 Exploration Systems (including the Space Launch System,
15 Orion, and Exploration Ground Systems), and NASA
16 science programs to engage students at the kindergarten
17 through grade 12 and higher education levels to pursue
18 learning and career opportunities in STEM fields.

19 (c) BRIEFING.—Not later than 1 year after the date
20 of the enactment of this Act, the Administrator shall brief
21 the appropriate committees of Congress on—

22 (1) the status of the programs described in sub-
23 section (a); and

1 (2) the manner by which each NASA STEM
2 education engagement activity is organized and
3 funded.

4 (d) STEM EDUCATION DEFINED.—In this section,
5 the term “STEM education” has the meaning given the
6 term in section 2 of the STEM Education Act of 2015
7 (Public Law 114–59; 42 U.S.C. 6621 note).

8 **SEC. 603. SKILLED TECHNICAL EDUCATION OUTREACH**
9 **PROGRAM.**

10 (a) ESTABLISHMENT.—The Administrator shall es-
11 tablish a program to conduct outreach to secondary school
12 students—

13 (1) to expose students to careers that require
14 career and technical education; and

15 (2) to encourage students to pursue careers
16 that require career and technical education.

17 (b) OUTREACH PLAN.—Not later than 180 days after
18 the date of the enactment of this Act, the Administrator
19 shall submit to the appropriate committees of Congress
20 a report on the outreach program under subsection (a)
21 that includes—

22 (1) an implementation plan;

23 (2) a description of the resources needed to
24 carry out the program; and

1 (3) any recommendations on expanding out-
 2 reach to secondary school students interested in
 3 skilled technical occupations.

4 (c) SYSTEMS OBSERVATION.—

5 (1) IN GENERAL.—The Administrator shall de-
 6 velop a program and associated policies to allow stu-
 7 dents from accredited educational institutions to
 8 view the manufacturing, assembly, and testing of
 9 NASA-funded space and aeronautical systems, as
 10 the Administrator considers appropriate.

11 (2) CONSIDERATIONS.—In developing the pro-
 12 gram and policies under paragraph (1), the Adminis-
 13 trator shall take into consideration factors such as
 14 workplace safety, mission needs, and the protection
 15 of sensitive and proprietary technologies.

16 **SEC. 604. NATIONAL SPACE GRANT COLLEGE AND FELLOW-**
 17 **SHIP PROGRAM.**

18 (a) PURPOSES.—Section 40301 of title 51, United
 19 States Code, is amended—

20 (1) in paragraph (3)—

21 (A) in subparagraph (B), by striking
 22 “and” at the end;

23 (B) in subparagraph (C), by adding “and”
 24 after the semicolon at the end; and

25 (C) by adding at the end the following:

1 “(D) promote equally the State and re-
2 gional STEM interests of each space grant con-
3 sortium;” and

4 (2) in paragraph (4), by striking “made up of
5 university and industry members, in order to ad-
6 vance” and inserting “comprised of members of uni-
7 versities in each State and other entities, such as 2-
8 year colleges, industries, science learning centers,
9 museums, and government entities, to advance”.

10 (b) DEFINITIONS.—Section 40302 of title 51, United
11 States Code, is amended—

12 (1) by striking paragraph (3);

13 (2) by inserting after paragraph (2) the fol-
14 lowing:

15 “(3) LEAD INSTITUTION.—The term ‘lead insti-
16 tution’ means an entity in a State that—

17 “(A) was designated by the Administrator
18 under section 40306, as in effect on the day be-
19 fore the date of the enactment of the National
20 Aeronautics and Space Administration Author-
21 ization Act of 2020; or

22 “(B) is designated by the Administrator
23 under section 40303(d)(3).”;

24 (3) in paragraph (4), by striking “space grant
25 college, space grant regional consortium, institution

1 of higher education,” and inserting “lead institution,
2 space grant consortium,”;

3 (4) by striking paragraphs (6), (7), and (8);

4 (5) by inserting after paragraph (5) the fol-
5 lowing:

6 “(6) SPACE GRANT CONSORTIUM.—The term
7 ‘space grant consortium’ means a State-wide group,
8 led by a lead institution, that has established part-
9 nerships with other academic institutions, industries,
10 science learning centers, museums, and government
11 entities to promote a strong educational base in the
12 space and aeronautical sciences.”;

13 (6) by redesignating paragraph (9) as para-
14 graph (7);

15 (7) in paragraph (7)(B), as so redesignated, by
16 inserting “and aeronautics” after “space”;

17 (8) by striking paragraph (10); and

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

19 “(8) STEM.—The term ‘STEM’ means science,
20 technology, engineering, and mathematics.”.

21 (c) PROGRAM OBJECTIVE.—Section 40303 of title
22 51, United States Code, is amended—

23 (1) by striking subsections (d) and (e);

24 (2) by redesignating subsection (c) as sub-
25 section (e); and

1 (3) by striking subsection (b) and inserting the
2 following:

3 “(b) PROGRAM OBJECTIVE.—

4 “(1) IN GENERAL.—The Administrator shall
5 carry out the national space grant college and fel-
6 lowship program with the objective of providing
7 hands-on research, training, and education programs
8 with measurable outcomes in each State, including
9 programs to provide—

10 “(A) internships, fellowships, and scholar-
11 ships;

12 “(B) interdisciplinary hands-on mission
13 programs and design projects;

14 “(C) student internships with industry or
15 university researchers or at centers of the Ad-
16 ministration;

17 “(D) faculty and curriculum development
18 initiatives;

19 “(E) university-based research initiatives
20 relating to the Administration and the STEM
21 workforce needs of each State; or

22 “(F) STEM engagement programs for kin-
23 dergarten through grade 12 teachers and stu-
24 dents.

1 “(2) PROGRAM PRIORITIES.—In carrying out
 2 the objective described in paragraph (1), the Admin-
 3 istrator shall ensure that each program carried out
 4 by a space grant consortium under the national
 5 space grant college and fellowship program balances
 6 the following priorities:

7 “(A) The space and aeronautics research
 8 needs of the Administration, including the mis-
 9 sion directorates.

10 “(B) The need to develop a national
 11 STEM workforce.

12 “(C) The STEM workforce needs of the
 13 State.

14 “(c) PROGRAM ADMINISTERED THROUGH SPACE
 15 GRANT CONSORTIA.—The Administrator shall carry out
 16 the national space grant college and fellowship program
 17 through the space grant consortia.

18 “(d) SUSPENSION; TERMINATION; NEW COMPETI-
 19 TION.—

20 “(1) SUSPENSION.—The Administrator may,
 21 for cause and after an opportunity for hearing, sus-
 22 pend a lead institution that was designated by the
 23 Administrator under section 40306, as in effect on
 24 the day before the date of the enactment of the Na-

1 tional Aeronautics and Space Administration Au-
2 thorization Act of 2020.

3 “(2) TERMINATION.—If the issue resulting in a
4 suspension under paragraph (1) is not resolved with-
5 in a period determined by the Administrator, the
6 Administrator may terminate the designation of the
7 entity as a lead institution.

8 “(3) NEW COMPETITION.—If the Administrator
9 terminates the designation of an entity as a lead in-
10 stitution, the Administrator may initiate a new com-
11 petition in the applicable State for the designation of
12 a lead institution.”.

13 (d) GRANTS.—Section 40304 of title 51, United
14 States Code, is amended to read as follows:

15 **“§ 40304. Grants**

16 “(a) ELIGIBLE SPACE GRANT CONSORTIUM DE-
17 FINED.—In this section, the term ‘eligible space grant
18 consortium’ means a space grant consortium that the Ad-
19 ministrator has determined—

20 “(1) has the capability and objective to carry
21 out not fewer than 3 of the 6 programs under sec-
22 tion 40303(b)(1);

23 “(2) will carry out programs that balance the
24 priorities described in section 40303(b)(2); and

1 “(3) is engaged in research, training, and edu-
2 cation relating to space and aeronautics.

3 “(b) GRANTS.—

4 “(1) IN GENERAL.—The Administrator shall
5 award grants to the lead institutions of eligible space
6 grant consortia to carry out the programs under sec-
7 tion 40303(b)(1).

8 “(2) REQUEST FOR PROPOSALS.—

9 “(A) IN GENERAL.—On the expiration of
10 existing cooperative agreements between the
11 Administration and the space grant consortia,
12 the Administrator shall issue a request for pro-
13 posals from space grant consortia for the award
14 of grants under this section.

15 “(B) APPLICATIONS.—A lead institution of
16 a space grant consortium that seeks a grant
17 under this section shall submit, on behalf of
18 such space grant consortium, an application to
19 the Administrator at such time, in such man-
20 ner, and accompanied by such information as
21 the Administrator may require.

22 “(3) GRANT AWARDS.—The Administrator shall
23 award 1 or more 5-year grants, disbursed in annual
24 installments, to the lead institution of the eligible
25 space grant consortium of—

1 “(A) each State;

2 “(B) the District of Columbia; and

3 “(C) the Commonwealth of Puerto Rico.

4 “(4) USE OF FUNDS.—A grant awarded under
5 this section shall be used by an eligible space grant
6 consortium to carry out not fewer than 3 of the 6
7 programs under section 40303(b)(1).

8 “(c) ALLOCATION OF FUNDING.—

9 “(1) PROGRAM IMPLEMENTATION.—

10 “(A) IN GENERAL.—To carry out the ob-
11 jective described in section 40303(b)(1), of the
12 funds made available each fiscal year for the
13 national space grant college and fellowship pro-
14 gram, the Administrator shall allocate not less
15 than 85 percent as follows:

16 “(i) The 52 eligible space grant con-
17 sortia shall each receive an equal share.

18 “(ii) The territories of Guam and the
19 United States Virgin Islands shall each re-
20 ceive funds equal to approximately $\frac{1}{5}$ of
21 the share for each eligible space grant con-
22 sortia.

23 “(B) MATCHING REQUIREMENT.—Each el-
24 igible space grant consortium shall match the
25 funds allocated under subparagraph (A)(i) on a

1 basis of not less than 1 non-Federal dollar for
2 every 1 Federal dollar, except that any program
3 funded under paragraph (3) or any program to
4 carry out 1 or more internships or fellowships
5 shall not be subject to that matching require-
6 ment.

7 “(2) PROGRAM ADMINISTRATION.—

8 “(A) IN GENERAL.—Of the funds made
9 available each fiscal year for the national space
10 grant college and fellowship program, the Ad-
11 ministrator shall allocate not more than 10 per-
12 cent for the administration of the program.

13 “(B) COSTS COVERED.—The funds allo-
14 cated under subparagraph (A) shall cover all
15 costs of the Administration associated with the
16 administration of the national space grant col-
17 lege and fellowship program, including—

18 “(i) direct costs of the program, in-
19 cluding costs relating to support services
20 and civil service salaries and benefits;

21 “(ii) indirect general and administra-
22 tive costs of centers and facilities of the
23 Administration; and

1 “(iii) indirect general and administra-
 2 tive costs of the Administration head-
 3 quarters.

4 “(3) SPECIAL PROGRAMS.—Of the funds made
 5 available each fiscal year for the national space
 6 grant college and fellowship program, the Adminis-
 7 trator shall allocate not more than 5 percent to the
 8 lead institutions of space grant consortia established
 9 as of the date of the enactment of the National Aer-
 10 onautics and Space Administration Authorization
 11 Act of 2020 for grants to carry out innovative ap-
 12 proaches and programs to further science and edu-
 13 cation relating to the missions of the Administration
 14 and STEM disciplines.

15 “(d) TERMS AND CONDITIONS.—

16 “(1) LIMITATIONS.—Amounts made available
 17 through a grant under this section may not be ap-
 18 plied to—

19 “(A) the purchase of land;

20 “(B) the purchase, construction, preserva-
 21 tion, or repair of a building; or

22 “(C) the purchase or construction of a
 23 launch facility or launch vehicle.

24 “(2) LEASES.—Notwithstanding paragraph (1),
 25 land, buildings, launch facilities, and launch vehicles

1 may be leased under a grant on written approval by
2 the Administrator.

3 “(3) RECORDS.—

4 “(A) IN GENERAL.—Any person that re-
5 ceives or uses the proceeds of a grant under
6 this section shall keep such records as the Ad-
7 ministrator shall by regulation prescribe as
8 being necessary and appropriate to facilitate ef-
9 fective audit and evaluation, including records
10 that fully disclose the amount and disposition
11 by a recipient of such proceeds, the total cost
12 of the program or project in connection with
13 which such proceeds were used, and the
14 amount, if any, of such cost that was provided
15 through other sources.

16 “(B) MAINTENANCE OF RECORDS.—

17 Records under subparagraph (A) shall be main-
18 tained for not less than 3 years after the date
19 of completion of such a program or project.

20 “(C) ACCESS.—For the purpose of audit

21 and evaluation, the Administrator and the
22 Comptroller General of the United States shall
23 have access to any books, documents, papers,
24 and records of receipts relating to a grant

1 under this section, as determined by the Admin-
 2 istrator or Comptroller General.”.

3 (e) PROGRAM STREAMLINING.—Title 51, United
 4 States Code, is amended—

5 (1) by striking sections 40305 through 40308,
 6 40310, and 40311; and

7 (2) by redesignating section 40309 as section
 8 40305.

9 (f) CONFORMING AMENDMENT.—The table of sec-
 10 tions at the beginning of chapter 403 of title 51, United
 11 States Code, is amended by striking the items relating to
 12 sections 40304 through 40311 and inserting the following:

“40304. Grants.

“40305. Availability of other Federal personnel and data.”.

13 **TITLE VII—WORKFORCE AND** 14 **INDUSTRIAL BASE**

15 **SEC. 701. APPOINTMENT AND COMPENSATION PILOT PRO-** 16 **GRAM.**

17 (a) DEFINITION OF COVERED PROVISIONS.—In this
 18 section, the term “covered provisions” means the provi-
 19 sions of title 5, United States Code, other than—

20 (1) section 2301 of that title;

21 (2) section 2302 of that title;

22 (3) chapter 71 of that title;

23 (4) section 7204 of that title; and

24 (5) chapter 73 of that title.

1 (b) ESTABLISHMENT.—There is established a 3-year
2 pilot program under which, notwithstanding section 20113
3 of title 51, United States Code, the Administrator may,
4 with respect to not more than 3,000 designated per-
5 sonnel—

6 (1) appoint and manage such designated per-
7 sonnel of the Administration, without regard to the
8 covered provisions; and

9 (2) fix the compensation of such designated
10 personnel of the Administration, without regard to
11 chapter 51 and subchapter III of chapter 53 of title
12 5, United States Code, at a rate that does not ex-
13 ceed the per annum rate of salary of the Vice Presi-
14 dent of the United States under section 104 of title
15 3, United States Code.

16 (c) ADMINISTRATOR RESPONSIBILITIES.—In car-
17 rying out the pilot program established under subsection
18 (b), the Administrator shall ensure that the pilot pro-
19 gram—

20 (1) uses—

21 (A) state-of-the-art recruitment techniques;

22 (B) simplified classification methods with
23 respect to personnel of the Administration; and

24 (C) broad banding; and

25 (2) offers—

1 (A) competitive compensation; and

2 (B) the opportunity for career mobility.

3 **SEC. 702. ESTABLISHMENT OF MULTI-INSTITUTION CON-**
4 **SORTIA.**

5 (a) IN GENERAL.—The Administrator, pursuant to
6 section 2304(c)(3)(B) of title 10, United States Code,
7 may—

8 (1) establish one or more multi-institution con-
9 sortia to facilitate access to essential engineering, re-
10 search, and development capabilities in support of
11 NASA missions;

12 (2) use such a consortium to fund technical
13 analyses and other engineering support to address
14 the acquisition, technical, and operational needs of
15 NASA centers; and

16 (3) ensure such a consortium—

17 (A) is held accountable for the technical
18 quality of the work product developed under
19 this section; and

20 (B) convenes disparate groups to facilitate
21 public-private partnerships.

22 (b) POLICIES AND PROCEDURES.—The Adminis-
23 trator shall develop and implement policies and procedures
24 to govern, with respect to the establishment of a consor-
25 tium under subsection (a)—

- 1 (1) the selection of participants;
- 2 (2) the award of cooperative agreements or
- 3 other contracts;
- 4 (3) the appropriate use of competitive awards
- 5 and sole source awards; and
- 6 (4) technical capabilities required.

7 (c) ELIGIBILITY.—The following entities shall be eli-
8 gible to participate in a consortium established under sub-
9 section (a):

- 10 (1) An institution of higher education (as de-
11 fined in section 102 of the Higher Education Act of
12 1965 (20 U.S.C. 1002)).
- 13 (2) An operator of a federally funded research
14 and development center.
- 15 (3) A nonprofit or not-for-profit research insti-
16 tution.
- 17 (4) A consortium composed of—
 - 18 (A) an entity described in paragraph (1),
 - 19 (2), or (3); and
 - 20 (B) one or more for-profit entities.

21 **SEC. 703. EXPEDITED ACCESS TO TECHNICAL TALENT AND**
22 **EXPERTISE.**

- 23 (a) IN GENERAL.—The Administrator may—
- 24 (1) establish one or more multi-institution task
 - 25 order contracts, consortia, cooperative agreements,

1 or other arrangements to facilitate expedited access
 2 to eligible entities in support of NASA missions; and

3 (2) use such a multi-institution task order con-
 4 tract, consortium, cooperative agreement, or other
 5 arrangement to fund technical analyses and other
 6 engineering support to address the acquisition, tech-
 7 nical, and operational needs of NASA centers.

8 (b) CONSULTATION WITH OTHER NASA-AFFILIATED
 9 ENTITIES.—To ensure access to technical expertise and
 10 reduce costs and duplicative efforts, a multi-institution
 11 task order contract, consortium, cooperative agreement, or
 12 any other arrangement established under subsection (a)(1)
 13 shall, to the maximum extent practicable, be carried out
 14 in consultation with other NASA-affiliated entities, includ-
 15 ing federally funded research and development centers,
 16 university-affiliated research centers, and NASA labora-
 17 tories and test centers.

18 (c) POLICIES AND PROCEDURES.—The Adminis-
 19 trator shall develop and implement policies and procedures
 20 to govern, with respect to the establishment of a multi-
 21 institution task order contract, consortium, cooperative
 22 agreement, or any other arrangement under subsection
 23 (a)(1)—

24 (1) the selection of participants;

25 (2) the award of task orders;

- 1 (3) the maximum award size for a task;
- 2 (4) the appropriate use of competitive awards
- 3 and sole source awards; and
- 4 (5) technical capabilities required.

5 (d) ELIGIBLE ENTITY DEFINED.—In this section,
6 the term “eligible entity” means—

- 7 (1) an institution of higher education (as de-
8 fined in section 102 of the Higher Education Act of
9 1965 (20 U.S.C. 1002));
- 10 (2) an operator of a federally funded research
11 and development center;
- 12 (3) a nonprofit or not-for-profit research insti-
13 tution; and
- 14 (4) a consortium composed of—
 - 15 (A) an entity described in paragraph (1),
 - 16 (2), or (3); and
 - 17 (B) one or more for-profit entities.

18 **SEC. 704. REPORT ON INDUSTRIAL BASE FOR CIVIL SPACE**
19 **MISSIONS AND OPERATIONS.**

20 (a) IN GENERAL.—Not later than 1 year after the
21 date of the enactment of this Act, and from time to time
22 thereafter, the Administrator shall submit to the appro-
23 priate committees of Congress a report on the United
24 States industrial base for NASA civil space missions and
25 operations.

1 (b) ELEMENTS.—The report required by subsection
2 (a) shall include the following:

3 (1) A comprehensive description of the current
4 status of the United States industrial base for
5 NASA civil space missions and operations.

6 (2) A description and assessment of the weak-
7 nesses in the supply chain, skills, manufacturing ca-
8 pacity, raw materials, key components, and other
9 areas of the United States industrial base for NASA
10 civil space missions and operations that could ad-
11 versely impact such missions and operations if un-
12 available.

13 (3) A description and assessment of various
14 mechanisms to address and mitigate the weaknesses
15 described pursuant to paragraph (2).

16 (4) A comprehensive list of the collaborative ef-
17 forts, including future and proposed collaborative ef-
18 forts, between NASA and the Manufacturing USA
19 institutes of the Department of Commerce.

20 (5) An assessment of—

21 (A) the defense and aerospace manufac-
22 turing supply chains relevant to NASA in each
23 region of the United States; and

24 (B) the feasibility and benefits of estab-
25 lishing a supply chain center of excellence in a

1 State in which NASA does not, as of the date
 2 of the enactment of this Act, have a research
 3 center or test facility.

4 (6) Such other matters relating to the United
 5 States industrial base for NASA civil space missions
 6 and operations as the Administrator considers ap-
 7 propriate.

8 **SEC. 705. SEPARATIONS AND RETIREMENT INCENTIVES.**

9 Section 20113 of title 51, United States Code, is
 10 amended by adding at the end the following:

11 “(o) PROVISIONS RELATED TO SEPARATION AND RE-
 12 TIREMENT INCENTIVES.—

13 “(1) DEFINITION.—In this subsection, the term
 14 ‘employee’—

15 “(A) means an employee of the Adminis-
 16 tration serving under an appointment without
 17 time limitation; and

18 “(B) does not include—

19 “(i) a reemployed annuitant under
 20 subchapter III of chapter 83 or chapter 84
 21 of title 5 or any other retirement system
 22 for employees of the Federal Government;

23 “(ii) an employee having a disability
 24 on the basis of which such employee is or
 25 would be eligible for disability retirement

1 under any of the retirement systems re-
2 ferred to in clause (i); or

3 “(iii) for purposes of eligibility for
4 separation incentives under this subsection,
5 an employee who is in receipt of a decision
6 notice of involuntary separation for mis-
7 conduct or unacceptable performance.

8 “(2) **AUTHORITY.**—The Administrator may es-
9 tablish a program under which employees may be el-
10 igible for early retirement, offered separation incen-
11 tive pay to separate from service voluntarily, or
12 both. This authority may be used to reduce the
13 number of personnel employed or to restructure the
14 workforce to meet mission objectives without reduc-
15 ing the overall number of personnel. This authority
16 is in addition to, and notwithstanding, any other au-
17 thorities established by law or regulation for such
18 programs.

19 “(3) **EARLY RETIREMENT.**—An employee who
20 is at least 50 years of age and has completed 20
21 years of service, or has at least 25 years of service,
22 may, pursuant to regulations promulgated under
23 this subsection, apply and be retired from the Ad-
24 ministration and receive benefits in accordance with
25 subchapter III of chapter 83 or 84 of title 5 if the

1 employee has been employed continuously within the
2 Administration for more than 30 days before the
3 date on which the determination to conduct a reduc-
4 tion or restructuring within 1 or more Administra-
5 tion centers is approved.

6 “(4) SEPARATION PAY.—

7 “(A) IN GENERAL.—Separation pay shall
8 be paid in a lump sum or in installments and
9 shall be equal to the lesser of—

10 “(i) an amount equal to the amount
11 the employee would be entitled to receive
12 under section 5595(c) of title 5, if the em-
13 ployee were entitled to payment under such
14 section; or

15 “(ii) \$40,000.

16 “(B) LIMITATIONS.—Separation pay shall
17 not be a basis for payment, and shall not be in-
18 cluded in the computation, of any other type of
19 Government benefit. Separation pay shall not
20 be taken into account for the purpose of deter-
21 mining the amount of any severance pay to
22 which an individual may be entitled under sec-
23 tion 5595 of title 5, based on any other separa-
24 tion.

1 “(C) INSTALLMENTS.—Separation pay, if
2 paid in installments, shall cease to be paid upon
3 the recipient’s acceptance of employment by the
4 Federal Government, or commencement of work
5 under a personal services contract as described
6 in paragraph (5).

7 “(5) LIMITATIONS ON REEMPLOYMENT.—

8 “(A) An employee who receives separation
9 pay under such program may not be reemployed
10 by the Administration for a 12-month period
11 beginning on the effective date of the employ-
12 ee’s separation, unless this prohibition is waived
13 by the Administrator on a case-by-case basis.

14 “(B) An employee who receives separation
15 pay under this section on the basis of a separa-
16 tion and accepts employment with the Govern-
17 ment of the United States, or who commences
18 work through a personal services contract with
19 the United States within 5 years after the date
20 of the separation on which payment of the sepa-
21 ration pay is based, shall be required to repay
22 the entire amount of the separation pay to the
23 Administration. If the employment is with an
24 Executive agency (as defined by section 105 of
25 title 5) other than the Administration, the Ad-

1 administrator may, at the request of the head of
2 that agency, waive the repayment if the indi-
3 vidual involved possesses unique abilities and is
4 the only qualified applicant available for the po-
5 sition. If the employment is within the Adminis-
6 tration, the Administrator may waive the repay-
7 ment if the individual involved is the only quali-
8 fied applicant available for the position. If the
9 employment is with an entity in the legislative
10 branch, the head of the entity or the appointing
11 official may waive the repayment if the indi-
12 vidual involved possesses unique abilities and is
13 the only qualified applicant available for the po-
14 sition. If the employment is with the judicial
15 branch, the Director of the Administrative Of-
16 fice of the United States Courts may waive the
17 repayment if the individual involved possesses
18 unique abilities and is the only qualified appli-
19 cant available for the position.

20 “(6) REGULATIONS.—Under the program es-
21 tablished under paragraph (2), early retirement and
22 separation pay may be offered only pursuant to reg-
23 ulations established by the Administrator, subject to
24 such limitations or conditions as the Administrator
25 may require.

1 “(7) USE OF EXISTING FUNDS.—The Adminis-
 2 trator shall carry out this subsection using amounts
 3 otherwise made available to the Administrator and
 4 no additional funds are authorized to be appro-
 5 priated to carry out this subsection.”.

6 **SEC. 706. CONFIDENTIALITY OF MEDICAL QUALITY ASSUR-**
 7 **ANCE RECORDS.**

8 (a) IN GENERAL.—Chapter 313 of title 51, United
 9 States Code, is amended by adding at the end the fol-
 10 lowing:

11 **“§ 31303. Confidentiality of medical quality assurance**
 12 **records**

13 “(a) IN GENERAL.—Except as provided in subsection
 14 (b)(1)—

15 “(1) a medical quality assurance record, or any
 16 part of a medical quality assurance record, may not
 17 be subject to discovery or admitted into evidence in
 18 a judicial or administrative proceeding; and

19 “(2) an individual who reviews or creates a
 20 medical quality assurance record for the Administra-
 21 tion, or participates in any proceeding that reviews
 22 or creates a medical quality assurance record, may
 23 not testify in a judicial or administrative proceeding
 24 with respect to—

1 “(A) the medical quality assurance record;

2 or

3 “(B) any finding, recommendation, evalua-
4 tion, opinion, or action taken by such individual
5 or in accordance with such proceeding with re-
6 spect to the medical quality assurance record.

7 “(b) DISCLOSURE OF RECORDS.—

8 “(1) IN GENERAL.—Notwithstanding subsection
9 (a), a medical quality assurance record may be dis-
10 closed to—

11 “(A) a Federal agency or private entity, if
12 the medical quality assurance record is nec-
13 essary for the Federal agency or private entity
14 to carry out—

15 “(i) licensing or accreditation func-
16 tions relating to Administration healthcare
17 facilities; or

18 “(ii) monitoring of Administration
19 healthcare facilities required by law;

20 “(B) a Federal agency or healthcare pro-
21 vider, if the medical quality assurance record is
22 required by the Federal agency or healthcare
23 provider to enable Administration participation
24 in a healthcare program of the Federal agency
25 or healthcare provider;

1 “(C) a criminal or civil law enforcement
2 agency, or an instrumentality authorized by law
3 to protect the public health or safety, on writ-
4 ten request by a qualified representative of such
5 agency or instrumentality submitted to the Ad-
6 ministrator that includes a description of the
7 lawful purpose for which the medical quality as-
8 surance record is requested;

9 “(D) an officer, an employee, or a con-
10 tractor of the Administration who requires the
11 medical quality assurance record to carry out
12 an official duty associated with healthcare;

13 “(E) healthcare personnel, to the extent
14 necessary to address a medical emergency af-
15 fecting the health or safety of an individual;
16 and

17 “(F) any committee, panel, or board con-
18 vened by the Administration to review the
19 healthcare-related policies and practices of the
20 Administration.

21 “(2) SUBSEQUENT DISCLOSURE PROHIBITED.—
22 An individual or entity to whom a medical quality
23 assurance record has been disclosed under para-
24 graph (1) may not make a subsequent disclosure of
25 the medical quality assurance record.

1 “(c) PERSONALLY IDENTIFIABLE INFORMATION.—

2 “(1) IN GENERAL.—Except as provided in para-
 3 graph (2), the personally identifiable information
 4 contained in a medical quality assurance record of a
 5 patient or an employee of the Administration, or any
 6 other individual associated with the Administration
 7 for purposes of a medical quality assurance pro-
 8 gram, shall be removed before the disclosure of the
 9 medical quality assurance record to an entity other
 10 than the Administration.

11 “(2) EXCEPTION.— Personally identifiable in-
 12 formation described in paragraph (1) may be re-
 13 leased to an entity other than the Administration if
 14 the Administrator makes a determination that the
 15 release of such personally identifiable information—

16 “(A) is in the best interests of the Admin-
 17 istration; and

18 “(B) does not constitute an unwarranted
 19 invasion of personal privacy.

20 “(d) EXCLUSION FROM FOIA.—A medical quality
 21 assurance record may not be made available to any person
 22 under section 552 of title 5, United States Code (com-
 23 monly referred to as the ‘Freedom of Information Act’),
 24 and this section shall be considered a statute described
 25 in subsection (b)(3)(B) of such section 522.

1 “(e) REGULATIONS.—Not later than one year after
2 the date of the enactment of this section, the Adminis-
3 trator shall promulgate regulations to implement this sec-
4 tion.

5 “(f) RULES OF CONSTRUCTION.—Nothing in this
6 section shall be construed—

7 “(1) to withhold a medical quality assurance
8 record from a committee of the Senate or House of
9 Representatives or a joint committee of Congress if
10 the medical quality assurance record relates to a
11 matter within the jurisdiction of such committee or
12 joint committee; or

13 “(2) to limit the use of a medical quality assur-
14 ance record within the Administration, including the
15 use by a contractor or consultant of the Administra-
16 tion.

17 “(g) DEFINITIONS.—In this section:

18 “(1) MEDICAL QUALITY ASSURANCE RECORD.—
19 The term ‘medical quality assurance record’ means
20 any proceeding, discussion, record, finding, rec-
21 ommendation, evaluation, opinion, minutes, report,
22 or other document or action that results from a
23 quality assurance committee, quality assurance pro-
24 gram, or quality assurance program activity.

25 “(2) QUALITY ASSURANCE PROGRAM.—

“(A) IN GENERAL.—The term ‘quality assurance program’ means a comprehensive program of the Administration—

“(i) to systematically review and improve the quality of medical and behavioral health services provided by the Administration to ensure the safety and security of individuals receiving such health services; and

“(ii) to evaluate and improve the efficiency, effectiveness, and use of staff and resources in the delivery of such health services.

“(B) INCLUSION.—The term ‘quality assurance program’ includes any activity carried out by or for the Administration to assess the quality of medical care provided by the Administration.”.

(b) TECHNICAL AND CONFORMING AMENDMENT.—

The table of sections for chapter 313 of title 51, United States Code, is amended by adding at the end the following:

“31303. Confidentiality of medical quality assurance records.”.

1 **TITLE VIII—MISCELLANEOUS**
2 **PROVISIONS**

3 **SEC. 801. CONTRACTING AUTHORITY.**

4 Section 20113 of title 51, United States Code, is
5 amended by adding at the end the following:

6 “(o) CONTRACTING AUTHORITY.—The Administra-
7 tion—

8 “(1) may enter into an agreement with a pri-
9 vate, commercial, or State government entity to pro-
10 vide the entity with supplies, support, and services
11 related to private, commercial, or State government
12 space activities carried out at a property owned or
13 operated by the Administration; and

14 “(2) upon the request of such an entity, may
15 include such supplies, support, and services in the
16 requirements of the Administration if—

17 “(A) the Administrator determines that
18 the inclusion of such supplies, support, or serv-
19 ices in such requirements—

20 “(i) is in the best interest of the Fed-
21 eral Government;

22 “(ii) does not interfere with the re-
23 quirements of the Administration; and

1 “(iii) does not compete with the com-
 2 mercial space activities of other such enti-
 3 ties; and

4 “(B) the Administration has full reimburs-
 5 able funding from the entity that requested
 6 supplies, support, and services prior to making
 7 any obligation for the delivery of such supplies,
 8 support, or services under an Administration
 9 procurement contract or any other agreement.”.

10 **SEC. 802. AUTHORITY FOR TRANSACTION PROTOTYPE**
 11 **PROJECTS AND FOLLOW-ON PRODUCTION**
 12 **CONTRACTS.**

13 Section 20113 of title 51, United States Code, as
 14 amended by section 801, is further amended by adding
 15 at the end the following:

16 “(p) TRANSACTION PROTOTYPE PROJECTS AND FOL-
 17 LOW-ON PRODUCTION CONTRACTS.—

18 “(1) IN GENERAL.—The Administration may
 19 enter into a transaction (other than a contract, co-
 20 operative agreement, or grant) to carry out a proto-
 21 type project that is directly relevant to enhancing
 22 the mission effectiveness of the Administration.

23 “(2) SUBSEQUENT AWARD OF FOLLOW-ON PRO-
 24 Duction CONTRACT.—A transaction entered into
 25 under this subsection for a prototype project may

1 provide for the subsequent award of a follow-on pro-
2 duction contract to participants in the transaction.

3 “(3) INCLUSION.—A transaction under this
4 subsection includes a project awarded to an indi-
5 vidual participant and to all individual projects
6 awarded to a consortium of United States industry
7 and academic institutions.

8 “(4) DETERMINATION.—The authority of this
9 section may be exercised for a transaction for a pro-
10 totype project and any follow-on production contract,
11 upon a determination by the head of the contracting
12 activity, in accordance with Administration policies,
13 that—

14 “(A) circumstances justify use of a trans-
15 action to provide an innovative business ar-
16 rangement that would not be feasible or appro-
17 priate under a contract; and

18 “(B) the use of the authority of this sec-
19 tion is essential to promoting the success of the
20 prototype project.

21 “(5) COMPETITIVE PROCEDURE.—

22 “(A) IN GENERAL.—To the maximum ex-
23 tent practicable, the Administrator shall use
24 competitive procedures with respect to entering

1 into a transaction to carry out a prototype
2 project.

3 “(B) EXCEPTION.—Notwithstanding sec-
4 tion 2304 of title 10, United States Code, a fol-
5 low-on production contract may be awarded to
6 the participants in the prototype transaction
7 without the use of competitive procedures, if—

8 “(i) competitive procedures were used
9 for the selection of parties for participation
10 in the prototype transaction; and

11 “(ii) the participants in the trans-
12 action successfully completed the prototype
13 project provided for in the transaction.

14 “(6) COST SHARE.—A transaction to carry out
15 a prototype project and a follow-on production con-
16 tract may require that part of the total cost of the
17 transaction or contract be paid by the participant or
18 contractor from a source other than the Federal
19 Government.

20 “(7) PROCUREMENT ETHICS.—A transaction
21 under this authority shall be considered an agency
22 procurement for purposes of chapter 21 of title 41,
23 United States Code, with regard to procurement eth-
24 ics.”.

1 **SEC. 803. PROTECTION OF DATA AND INFORMATION FROM**
 2 **PUBLIC DISCLOSURE.**

3 (a) CERTAIN TECHNICAL DATA.—Section 20131 of
 4 title 51, United States Code, is amended—

5 (1) by redesignating subsection (c) as sub-
 6 section (d);

7 (2) in subsection (a)(3), by striking “subsection
 8 (b)” and inserting “subsection (b) or (c)”;

9 (3) by inserting after subsection (b) the fol-
 10 lowing:

11 “(c) SPECIAL HANDLING OF CERTAIN TECHNICAL
 12 DATA.—

13 “(1) IN GENERAL.—The Administrator may
 14 provide appropriate protections against the public
 15 dissemination of certain technical data, including ex-
 16 emption from subchapter II of chapter 5 of title 5.

17 “(2) DEFINITIONS.—In this subsection:

18 “(A) CERTAIN TECHNICAL DATA.—The
 19 term ‘certain technical data’ means technical
 20 data that may not be exported lawfully outside
 21 the United States without approval, authoriza-
 22 tion, or license under—

23 “(i) the Export Control Reform Act of
 24 2018 (Public Law 115–232; 132 Stat.
 25 2208); or

1 “(ii) the International Security Assist-
 2 ance and Arms Export Control Act of
 3 1976 (Public Law 94–329; 90 Stat. 729).

4 “(B) TECHNICAL DATA.—The term ‘tech-
 5 nical data’ means any blueprint, drawing, pho-
 6 tograph, plan, instruction, computer software,
 7 or documentation, or any other technical infor-
 8 mation.”;

9 (4) in subsection (d), as so redesignated, by in-
 10 serting “, including any data,” after “information”;
 11 and

12 (5) by adding at the end the following:

13 “(e) EXCLUSION FROM FOIA.—This section shall be
 14 considered a statute described in subsection (b)(3)(B) of
 15 section 552 of title 5 (commonly referred to as the ‘Free-
 16 dom of Information Act’).”.

17 (b) CERTAIN VOLUNTARILY PROVIDED SAFETY-RE-
 18 LATED INFORMATION.—

19 (1) IN GENERAL.—The Administrator shall pro-
 20 vide appropriate safeguards against the public dis-
 21 semination of safety-related information collected as
 22 part of a mishap investigation carried out under the
 23 NASA safety reporting system or in conjunction
 24 with an organizational safety assessment, if the Ad-

1 administrator makes a written determination, including
2 a justification of the determination, that—

3 (A)(i) disclosure of the information would
4 inhibit individuals from voluntarily providing
5 safety-related information; and

6 (ii) the ability of NASA to collect such in-
7 formation improves the safety of NASA pro-
8 grams and research relating to aeronautics and
9 space; or

10 (B) withholding such information from public
11 disclosure improves the safety of such NASA pro-
12 grams and research.

13 (2) OTHER FEDERAL AGENCIES.—Notwith-
14 standing any other provision of law, if the Adminis-
15 trator provides to the head of another Federal agen-
16 cy safety-related information with respect to which
17 the Administrator has made a determination under
18 paragraph (1), the head of the Federal agency shall
19 withhold the information from public disclosure.

20 (3) PUBLIC AVAILABILITY.—A determination or
21 part of a determination under paragraph (1) shall be
22 made available to the public on request, as required
23 under section 552 of title 5, United States Code
24 (commonly referred to as the “Freedom of Informa-
25 tion Act”).

1 (4) EXCLUSION FROM FOIA.—This subsection
 2 shall be considered a statute described in subsection
 3 (b)(3)(B) of section 552 of title 5, United States
 4 Code.

5 **SEC. 804. PHYSICAL SECURITY MODERNIZATION.**

6 Chapter 201 of title 51, United States Code, is
 7 amended—

8 (1) in section 20133(2), by striking “property”
 9 and all that follows through “to the United States,”
 10 and inserting “Administration personnel or of prop-
 11 erty owned or leased by, or under the control of, the
 12 United States”; and

13 (2) in section 20134, in the second sentence—

14 (A) by inserting “Administration personnel
 15 or any” after “protecting”; and

16 (B) by striking “, at facilities owned or
 17 contracted to the Administration”.

18 **SEC. 805. LEASE OF NON-EXCESS PROPERTY.**

19 Section 20145 of title 51, United States Code, is
 20 amended—

21 (1) in paragraph (b)(1)(B), by striking “en-
 22 tered into for the purpose of developing renewable
 23 energy production facilities”; and

1 (2) in subsection (g), in the first sentence, by
2 striking “December 31, 2021” and inserting “De-
3 cember 31, 2025”.

4 **SEC. 806. CYBERSECURITY.**

5 (a) IN GENERAL.—Section 20301 of title 51, United
6 States Code, is amended by adding at the end the fol-
7 lowing:

8 “(c) CYBERSECURITY.—The Administrator shall up-
9 date and improve the cybersecurity of NASA space assets
10 and supporting infrastructure.”.

11 (b) SECURITY OPERATIONS CENTER.—

12 (1) ESTABLISHMENT.—The Administrator shall
13 maintain a Security Operations Center, to identify
14 and respond to cybersecurity threats to NASA infor-
15 mation technology systems, including institutional
16 systems and mission systems.

17 (2) INSPECTOR GENERAL RECOMMENDA-
18 TIONS.—The Administrator shall implement, to the
19 maximum extent practicable, each of the rec-
20 ommendations contained in the report of the Inspec-
21 tor General of NASA entitled “Audit of NASA’s Se-
22 curity Operations Center”, issued on May 23, 2018.

23 (c) CYBER THREAT HUNT.—

24 (1) IN GENERAL.—The Administrator, in co-
25 ordination with the Secretary of Homeland Security

1 and the heads of other relevant Federal agencies,
2 may implement a cyber threat hunt capability to
3 proactively search NASA information systems for
4 advanced cyber threats that otherwise evade existing
5 security tools.

6 (2) THREAT-HUNTING PROCESS.—In carrying
7 out paragraph (1), the Administrator shall develop
8 and document a threat-hunting process, including
9 the roles and responsibilities of individuals con-
10 ducting a cyber threat hunt.

11 (d) GAO PRIORITY RECOMMENDATIONS.—The Ad-
12 ministrator shall implement, to the maximum extent prac-
13 ticable, the recommendations for NASA contained in the
14 report of the Comptroller General of the United States
15 entitled “Information Security: Agencies Need to Improve
16 Controls over Selected High-Impact Systems”, issued May
17 18, 2016, including—

18 (1) re-evaluating security control assessments;
19 and
20 (2) specifying metrics for the continuous moni-
21 toring strategy of the Administration.

1 **SEC. 807. LIMITATION ON COOPERATION WITH THE PEO-**
 2 **PLE'S REPUBLIC OF CHINA.**

3 (a) IN GENERAL.—Except as provided by subsection
 4 (b), the Administrator, the Director of the OSTP, and the
 5 Chair of the National Space Council, shall not—

6 (1) develop, design, plan, promulgate, imple-
 7 ment, or execute a bilateral policy, program, order,
 8 or contract of any kind to participate, collaborate, or
 9 coordinate bilaterally in any manner with—

10 (A) the Government of the People's Repub-
 11 lic of China; or

12 (B) any company—

13 (i) owned by the Government of the
 14 People's Republic of China; or

15 (ii) incorporated under the laws of the
 16 People's Republic of China; and

17 (2) host official visitors from the People's Re-
 18 public of China at a facility belonging to or used by
 19 NASA.

20 (b) WAIVER.—

21 (1) IN GENERAL.—The Administrator, the Di-
 22 rector, or the Chair may waive the limitation under
 23 subsection (a) with respect to an activity described
 24 in that subsection only if the Administrator, the Di-
 25 rector, or the Chair, as applicable, makes a deter-
 26 mination that the activity—

1 (A) does not pose a risk of a transfer of
2 technology, data, or other information with na-
3 tional security or economic security implications
4 to an entity described in paragraph (1) of such
5 subsection; and

6 (B) does not involve knowing interactions
7 with officials who have been determined by the
8 United States to have direct involvement with
9 violations of human rights.

10 (2) CERTIFICATION TO CONGRESS.—Not later
11 than 30 days after the date on which a waiver is
12 granted under paragraph (1), the Administrator, the
13 Director, or the Chair, as applicable, shall submit to
14 the Committee on Commerce, Science, and Trans-
15 portation and the Committee on Appropriations of
16 the Senate and the Committee on Science, Space,
17 and Technology and the Committee on Appropria-
18 tions of the House of Representatives a written cer-
19 tification that the activity complies with the require-
20 ments in subparagraphs (A) and (B) of that para-
21 graph.

22 (c) GAO REVIEW.—

23 (1) IN GENERAL.—The Comptroller General of
24 the United States shall conduct a review of NASA
25 contracts that may subject the Administration to un-

1 acceptable transfers of intellectual property or tech-
2 nology to any entity—

3 (A) owned or controlled (in whole or in
4 part) by, or otherwise affiliated with, the Gov-
5 ernment of the People’s Republic of China; or

6 (B) organized under, or otherwise subject
7 to, the laws of the People’s Republic of China.

8 (2) ELEMENTS.—The review required under
9 paragraph (1) shall assess—

10 (A) whether the Administrator is aware—

11 (i) of any NASA contractor that bene-
12 fits from significant financial assistance
13 from—

14 (I) the Government of the Peo-
15 ple’s Republic of China;

16 (II) any entity controlled by the
17 Government of the People’s Republic
18 of China; or

19 (III) any other governmental en-
20 tity of the People’s Republic of China;
21 and

22 (ii) that the Government of the Peo-
23 ple’s Republic of China, or an entity con-
24 trolled by the Government of the People’s
25 Republic of China, may be—

1 (I) leveraging United States com-
2 panies that share ownership with
3 NASA contractors; or

4 (II) obtaining intellectual prop-
5 erty or technology illicitly or by other
6 unacceptable means; and

7 (B) the steps the Administrator is taking
8 to ensure that—

9 (i) NASA contractors are not being le-
10 veraged (directly or indirectly) by the Gov-
11 ernment of the People’s Republic of China
12 or by an entity controlled by the Govern-
13 ment of the People’s Republic of China;

14 (ii) the intellectual property and tech-
15 nology of NASA contractors are adequately
16 protected; and

17 (iii) NASA flight-critical components
18 are not sourced from the People’s Republic
19 of China through any entity benefiting
20 from Chinese investments, loans, or other
21 assistance.

22 (3) RECOMMENDATIONS.—The Comptroller
23 General shall provide to the Administrator rec-
24 ommendations for future NASA contracting based
25 on the results of the review.

(4) PLAN.—Not later than 180 days after the date on which the Comptroller General completes the review, the Administrator shall—

(A) develop a plan to implement the recommendations of the Comptroller General; and

(B) submit the plan to the appropriate committees of Congress.

SEC. 808. CONSIDERATION OF ISSUES RELATED TO CONTRACTING WITH ENTITIES RECEIVING ASSISTANCE FROM OR AFFILIATED WITH THE PEOPLE'S REPUBLIC OF CHINA.

(a) IN GENERAL.—With respect to a matter in response to a request for proposal or a broad area announcement by the Administrator, or award of any contract, agreement, or other transaction with the Administrator, a commercial or noncommercial entity shall certify that it is not majority owned or controlled (as defined in section 800.208 of title 31, Code of Federal Regulations), or minority owned greater than 25 percent, by—

(1) any governmental organization of the People's Republic of China; or

(2) any other entity that is—

(A) known to be owned or controlled by any governmental organization of the People's Republic of China; or

1 (B) organized under, or otherwise subject
2 to, the laws of the People's Republic of China.

3 (b) FALSE STATEMENTS.—

4 (1) IN GENERAL.—A false statement contained
5 in a certification under subsection (a) constitutes a
6 false or fraudulent claim for purposes of chapter 47
7 of title 18, United States Code.

8 (2) ACTION UNDER FEDERAL ACQUISITION
9 REGULATION.—Any party convicted for making a
10 false statement with respect to a certification under
11 subsection (a) shall be subject to debarment from
12 contracting with the Administrator for a period of
13 not less than 1 year, as determined by the Adminis-
14 trator, in addition to other appropriate action in ac-
15 cordance with the Federal Acquisition Regulation
16 maintained under section 1303(a)(1) of title 41,
17 United States Code.

18 (c) ANNUAL REPORT.—The Administrator shall sub-
19 mit to the appropriate committees of Congress an annual
20 report detailing any violation of this section.

21 **SEC. 809. SMALL SATELLITE LAUNCH SERVICES PROGRAM.**

22 (a) IN GENERAL.—The Administrator shall continue
23 to procure dedicated launch services, including from small
24 and venture class launch providers, for small satellites, in-

cluding CubeSats, for the purpose of conducting science and technology missions that further the goals of NASA.

(b) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall engage with the academic community to maximize awareness and use of dedicated small satellite launch opportunities.

(c) RULE OF CONSTRUCTION.—Nothing in this section shall prevent the Administrator from continuing to use a secondary payload of procured launch services for CubeSats.

SEC. 810. 21ST CENTURY SPACE LAUNCH INFRASTRUCTURE.

(a) IN GENERAL.—The Administrator shall carry out a program to modernize multi-user launch infrastructure at NASA facilities—

- (1) to enhance safety; and
- (2) to advance Government and commercial space transportation and exploration.

(b) PROJECTS.—Projects funded under the program under subsection (a) may include—

- (1) infrastructure relating to commodities;
- (2) standard interfaces to meet customer needs for multiple payload processing and launch vehicle processing;

1 (3) enhancements to range capacity and flexi-
2 bility; and

3 (4) such other projects as the Administrator
4 considers appropriate to meet the goals described in
5 subsection (a).

6 (c) REQUIREMENTS.—In carrying out the program
7 under subsection (a), the Administrator shall—

8 (1) identify and prioritize investments in
9 projects that can be used by multiple users and
10 launch vehicles, including non-NASA users and
11 launch vehicles; and

12 (2) limit investments to projects that would not
13 otherwise be funded by a NASA program, such as
14 an institutional or programmatic infrastructure pro-
15 gram.

16 (d) RULE OF CONSTRUCTION.—Nothing in this sec-
17 tion shall preclude a NASA program, including the Space
18 Launch System and Orion, from using the launch infra-
19 structure modernized under this section.

20 **SEC. 811. MISSIONS OF NATIONAL NEED.**

21 (a) SENSE OF CONGRESS.—It is the Sense of Con-
22 gress that—

23 (1) while certain space missions, such as aster-
24 oid detection or space debris mitigation or removal
25 missions, may not provide the highest-value science,

1 as determined by the National Academies of Science,
2 Engineering, and Medicine decadal surveys, such
3 missions provide tremendous value to the United
4 States and the world; and

5 (2) the current organizational and funding
6 structure of NASA has not prioritized the funding
7 of missions of national need.

8 (b) STUDY.—

9 (1) IN GENERAL.—The Director of the OSTP
10 shall conduct a study on the manner in which NASA
11 funds missions of national need.

12 (2) MATTERS TO BE INCLUDED.—The study
13 conducted under paragraph (1) shall include the fol-
14 lowing:

15 (A) An identification and assessment of
16 the types of missions or technology development
17 programs that constitute missions of national
18 need.

19 (B) An assessment of the manner in which
20 such missions are currently funded and man-
21 aged by NASA.

22 (C) An analysis of the options for funding
23 missions of national need, including—

24 (i) structural changes required to
25 allow NASA to fund such missions; and

1 (ii) an assessment of the capacity of
2 other Federal agencies to make funds
3 available for such missions.

4 (c) REPORT TO CONGRESS.—Not later than 1 year
5 after the date of the enactment of this Act, the Director
6 of the OSTP shall submit to the appropriate committees
7 of Congress a report on the results of the study conducted
8 under subsection (b), including recommendations for fund-
9 ing missions of national need.

10 **SEC. 812. DRINKING WATER WELL REPLACEMENT FOR**
11 **CHINCOTEAGUE, VIRGINIA.**

12 Notwithstanding any other provision of law, during
13 the 5-year period beginning on the date of the enactment
14 of this Act, the Administrator may enter into 1 or more
15 agreements with the town of Chincoteague, Virginia, to
16 reimburse the town for costs that are directly associated
17 with—

18 (1) the removal of drinking water wells located
19 on property administered by the Administration; and

20 (2) the relocation of such wells to property
21 under the administrative control, through lease, own-
22 ership, or easement, of the town.

23 **SEC. 813. PASSENGER CARRIER USE.**

24 Section 1344(a)(2) of title 31, United States Code,
25 is amended—

1 (1) in subparagraph (A), by striking “or” at
2 the end;

3 (2) in subparagraph (B), by inserting “or”
4 after the comma at the end; and

5 (3) by inserting after subparagraph (B) the fol-
6 lowing:

7 “(C) necessary for post-flight transportation of
8 United States Government astronauts, and other as-
9 tronauts subject to reimbursable arrangements, re-
10 turning from space for the performance of medical
11 research, monitoring, diagnosis, or treatment, or
12 other official duties, prior to receiving post-flight
13 medical clearance to operate a motor vehicle,”.

14 **SEC. 814. USE OF COMMERCIAL NEAR-SPACE BALLOONS.**

15 (a) SENSE OF CONGRESS.—It is the sense of Con-
16 gress that the use of an array of capabilities, including
17 the use of commercially available near-space balloon as-
18 sets, is in the best interest of the United States.

19 (b) USE OF COMMERCIAL NEAR-SPACE BALLOONS.—
20 The Administrator shall use commercially available bal-
21 loon assets operating at near-space altitudes, to the max-
22 imum extent practicable, as part of a diverse set of capa-
23 bilities to effectively and efficiently meet the goals of the
24 Administration.

1 **SEC. 815. PRESIDENT’S SPACE ADVISORY BOARD.**

2 Section 121 of the National Aeronautics and Space
3 Administration Authorization Act, Fiscal Year 1991 (Pub-
4 lic Law 101–611; 51 U.S.C. 20111 note) is amended—

5 (1) in the section heading, by striking “**USERS’**
6 **ADVISORY GROUP**” and inserting “**PRESIDENT’S**
7 **SPACE ADVISORY BOARD**”; and

8 (2) by striking “Users’ Advisory Group” each
9 place it appears and inserting “President’s Space
10 Advisory Board.”

11 **SEC. 816. INITIATIVE ON TECHNOLOGIES FOR NOISE AND**
12 **EMISSIONS REDUCTIONS.**

13 (a) INITIATIVE REQUIRED.—Section 40112 of title
14 51, United States Code, is amended—

15 (1) by redesignating subsections (b) through (f)
16 as subsections (c) through (g), respectively; and

17 (2) by inserting after subsection (a) the fol-
18 lowing new subsection (b):

19 “(b) TECHNOLOGIES FOR NOISE AND EMISSIONS RE-
20 Duction.—

21 “(1) INITIATIVE REQUIRED.—The Adminis-
22 trator shall establish an initiative to build upon and
23 accelerate previous or ongoing work to develop and
24 demonstrate new technologies, including systems ar-
25 chitecture, components, or integration of systems
26 and airframe structures, in electric aircraft propul-

1 sion concepts that are capable of substantially reduc-
2 ing both emissions and noise from aircraft.

3 “(2) APPROACH.—In carrying out the initiative,
4 the Administrator shall do the following:

5 “(A) Continue and expand work of the Ad-
6 ministration on research, development, and
7 demonstration of electric aircraft concepts, and
8 the integration of such concepts.

9 “(B) To the extent practicable, work with
10 multiple partners, including small businesses
11 and new entrants, on research and development
12 activities related to transport category aircraft.

13 “(C) Provide guidance to the Federal Avia-
14 tion Administration on technologies developed
15 and tested pursuant to the initiative.”.

16 (b) REPORTS.—Not later than 180 days after the
17 date of the enactment of this Act, and annually thereafter
18 as a part of the Administration’s budget submission, the
19 Administrator shall submit a report to the appropriate
20 committee of Congress on the progress of the work under
21 the initiative required by subsection (b) of section 40112
22 of title 51, United States Code (as amended by subsection
23 (a) of this section), including an updated, anticipated
24 timeframe for aircraft entering into service that produce

1 50 percent less noise and emissions than the highest per-
2 forming aircraft in service as of December 31, 2019.

3 **SEC. 817. REMEDIATION OF SITES CONTAMINATED WITH**
4 **TRICHLOROETHYLENE.**

5 (a) IDENTIFICATION OF SITES.—Not later than 180
6 days after the date of the enactment of this Act, the Ad-
7 ministrator shall identify sites of the Administration con-
8 taminated with trichloroethylene.

9 (b) REPORT REQUIRED.—Not later than 1 year after
10 the date of the enactment of this Act, the Administrator
11 shall submit to the appropriate committees of Congress
12 a report that includes—

13 (1) the recommendations of the Administrator
14 for remediating the sites identified under subsection
15 (a) during the 5-year period beginning on the date
16 of the report; and

17 (2) an estimate of the financial resources nec-
18 essary to implement those recommendations.

19 **SEC. 818. REPORT ON MERITS AND OPTIONS FOR ESTAB-**
20 **LISHING AN INSTITUTE RELATING TO SPACE**
21 **RESOURCES.**

22 (a) REPORT.—

23 (1) IN GENERAL.—Not later than 180 days
24 after the date of the enactment of this Act, the Ad-
25 ministrator shall submit to the appropriate commit-

tees of Congress a report on the merits of, and options for, establishing an institute relating to space resources to advance the objectives of NASA in maintaining United States preeminence in space described in paragraph (3).

(2) MATTERS TO BE INCLUDED.—The report required by paragraph (1) shall include an assessment by the Administrator as to whether—

(A) a virtual or physical institute relating to space resources is most cost effective and appropriate; and

(B) partnering with institutions of higher education and the aerospace industry, and the extractive industry as appropriate, would be effective in increasing information available to such an institute with respect to advancing the objectives described in paragraph (3).

(3) OBJECTIVES.—The objectives described in this paragraph are the following:

(A) Identifying, developing, and distributing space resources, including by encouraging the development of foundational science and technology.

(B) Reducing the technological risks associated with identifying, developing, and distributing space resources.

(C) Developing options for using space resources—

(i) to support current and future space architectures, programs, and missions; and

(ii) to enable architectures, programs, and missions that would not otherwise be possible.

(4) DEFINITIONS.—In this section:

(A) EXTRACTIVE INDUSTRY.—The term “extractive industry” means a company or individual involved in the process of extracting (including mining, quarrying, drilling, and dredging) space resources.

(B) INSTITUTION OF HIGHER EDUCATION.—The term “institution of higher education” has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(C) SPACE RESOURCE.—

1 (i) IN GENERAL.—The term “space
2 resource” means an abiotic resource in situ
3 in outer space.

4 (ii) INCLUSIONS.—The term “space
5 resource” includes a raw material, a nat-
6 ural material, and an energy source.

7 **SEC. 819. REPORT ON ESTABLISHING CENTER OF EXCEL-**
8 **LENCE FOR SPACE WEATHER TECHNOLOGY.**

9 (a) IN GENERAL.—Not later than 180 days after the
10 date of the enactment of this Act, the Administrator shall
11 submit to the appropriate committees of Congress a report
12 assessing the potential benefits of establishing a NASA
13 center of excellence for space weather technology.

14 (b) GEOGRAPHIC CONSIDERATIONS.—In the report
15 required by subsection (a), the Administrator shall con-
16 sider the benefits of establishing the center of excellence
17 described in that subsection in a geographic area—

18 (1) in close proximity to—

19 (A) significant government-funded space
20 weather research activities; and

21 (B) institutions of higher education; and

22 (2) where NASA may have been previously
23 underrepresented.

1 **SEC. 820. REVIEW ON PREFERENCE FOR DOMESTIC SUP-**
2 **PLIERS.**

3 (a) SENSE OF CONGRESS.—It is the Sense of Con-
4 gress that the Administration should, to the maximum ex-
5 tent practicable and with due consideration of foreign pol-
6 icy goals and obligations under Federal law—

7 (1) use domestic suppliers of goods and serv-
8 ices; and

9 (2) ensure compliance with the Federal acquisi-
10 tion regulations, including subcontract flow-down
11 provisions.

12 (b) REVIEW.—

13 (1) IN GENERAL.—Not later than 180 days
14 after the date of the enactment of this Act, the Ad-
15 ministrator shall undertake a comprehensive review
16 of the domestic supplier preferences of the Adminis-
17 tration and the obligations of the Administration
18 under the Federal acquisition regulations to ensure
19 compliance, particularly with respect to Federal ac-
20 quisition regulations provisions that apply to foreign-
21 based subcontractors.

22 (2) ELEMENTS.—The review under paragraph
23 (1) shall include—

24 (A) an assessment as to whether the Ad-
25 ministration has provided funding for infra-

1 structure of a foreign-owned company or State-
2 sponsored entity in recent years; and

3 (B) a review of any impact such funding
4 has had on domestic service providers.

5 (c) REPORT.—The Administrator shall submit to the
6 appropriate committees of Congress a report on the re-
7 sults of the review.

8 **SEC. 821. REPORT ON UTILIZATION OF COMMERCIAL**
9 **SPACEPORTS LICENSED BY FEDERAL AVIA-**
10 **TION ADMINISTRATION.**

11 (a) IN GENERAL.—Not later than 1 year after the
12 date of the enactment of this Act, the Administrator shall
13 submit to the appropriate committees of Congress a report
14 on the benefits of increased utilization of commercial
15 spaceports licensed by the Federal Aviation Administra-
16 tion for NASA civil space missions and operations.

17 (b) ELEMENTS.—The report required by subsection
18 (a) shall include the following:

19 (1) A description and assessment of current uti-
20 lization of commercial spaceports licensed by the
21 Federal Aviation Administration for NASA civil
22 space missions and operations.

23 (2) A description and assessment of the benefits
24 of increased utilization of such spaceports for such
25 missions and operations.

1 (3) A description and assessment of the steps
2 necessary to achieve increased utilization of such
3 spaceports for such missions and operations.

4 **SEC. 822. ACTIVE ORBITAL DEBRIS MITIGATION.**

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

7 (1) orbital debris, particularly in low-Earth
8 orbit, poses a hazard to NASA missions, particularly
9 human spaceflight; and

10 (2) progress has been made on the development
11 of guidelines for long-term space sustainability
12 through the United Nations Committee on the
13 Peaceful Uses of Outer Space.

14 (b) REQUIREMENTS.—The Administrator should—

15 (1) ensure the policies and standard practices
16 of NASA meet or exceed international guidelines for
17 spaceflight safety; and

18 (2) support the development of orbital debris
19 mitigation technologies through continued research
20 and development of concepts.

21 (c) REPORT TO CONGRESS.—Not later than 90 days
22 after the date of the enactment of this Act, the Adminis-
23 trator shall submit to the appropriate committees of Con-
24 gress a report on the status of implementing subsection
25 (b).

1 **SEC. 823. STUDY ON COMMERCIAL COMMUNICATIONS**
2 **SERVICES.**

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

5 (1) enhancing the ability of researchers to con-
6 duct and interact with experiments while in flight
7 would make huge advancements in the overall profit-
8 ability of conducting research on suborbit and low-
9 Earth orbit payloads; and

10 (2) current NASA communications do not allow
11 for real-time data collection, observation, or trans-
12 mission of information.

13 (b) STUDY.—The Administrator shall conduct a
14 study on the feasibility, impact, and cost of using commer-
15 cial communications programs services for suborbital
16 flight programs and low-Earth orbit research.

17 (c) REPORT.—Not later than 18 months after the
18 date of the enactment of this Act, the Administrator shall
19 submit to Congress and make publicly available a report
20 that describes the results of the study conducted under
21 subsection (b).

Passed the Senate December 18, 2020.

Attest:

Secretary.

116TH CONGRESS
2D SESSION

S. 2800

AN ACT

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