

AMENDMENT NO. _____ Calendar No. _____

Purpose: In the nature of a substitute.

IN THE SENATE OF THE UNITED STATES—116th Cong., 2d Sess.

S. 2800

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

Referred to the Committee on _____ and
ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENT IN THE NATURE OF A SUBSTITUTE intended
to be proposed by Mr. CRUZ (for himself, Ms. SINEMA,
Mr. WICKER, and Ms. CANTWELL)

Viz:

1 Strike all after the enacting clause and insert the fol-

2 lowing:

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

4 (a) SHORT TITLE.—This Act may be cited as the

5 “National Aeronautics and Space Administration Author-

6 ization Act of 2020”.

7 (b) TABLE OF CONTENTS.—The table of contents of

8 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

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- Sec. 201. Advanced eislunar 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 inventions.
- Sec. 214. Data first produced during non-NASA scientific use of the ISS national 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.

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- 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.

17 (4) CISLUNAR SPACE.—The term “cislunar
18 space” means the region of space beyond low-Earth
19 orbit out to and including the region around the sur-
20 face of the Moon.

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

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

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

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

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

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

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

17 (12) SPACE LAUNCH SYSTEM.—The term
18 “Space Launch System” means the Space Launch
19 System authorized under section 302 of the National
20 Aeronautics and Space Administration Act of 2010
21 (42 U.S.C. 18322).

1 **TITLE I—AUTHORIZATION OF**
2 **APPROPRIATIONS**

3 **SEC. 101. AUTHORIZATION OF APPROPRIATIONS.**

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

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

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

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

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

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

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

14 (7) For Safety, Security, and Mission Services,
15 \$2,936,500,000.

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

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

19 **TITLE II—HUMAN SPACEFLIGHT**
20 **AND EXPLORATION**

21 **SEC. 201. ADVANCED CISLUNAR AND LUNAR SURFACE CA-**
22 **PABILITIES.**

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

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

4 (2) NASA developed the Artemis program—

5 (A) to fulfill the goal of landing United
6 States astronauts, including the first woman
7 and the next man, on the Moon; and

8 (B) to collaborate with commercial and
9 international partners to establish sustainable
10 lunar exploration by 2028; and

11 (3) in carrying out the Artemis program, the
12 Administration should ensure that the entire
13 Artemis program is inclusive and representative of
14 all people of the United States, including women and
15 minorities.

16 (b) LANDER PROGRAM.—

17 (1) IN GENERAL.—The Administrator shall fos-
18 ter the flight demonstration of not more than 2
19 human-class lunar lander designs through public-pri-
20 vate partnerships.

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

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

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

3 (2) to the maximum extent practicable, encour-
4 age reusability and sustainability of systems devel-
5 oped;

6 (3) prioritize safety and implement robust
7 ground and in-space test requirements;

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

10 (5) to the maximum extent practicable, offer ex-
11 isting capabilities and assets of NASA centers to
12 support these partnerships.

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

14 (a) **MOBILE LAUNCH PLATFORM.**—The Adminis-
15 trator is authorized to maintain 2 operational mobile
16 launch platforms to enable the launch of multiple configu-
17 rations of the Space Launch System.

18 (b) **EXPLORATION UPPER STAGE.**—To meet the ca-
19 pability requirements under section 302(c)(2) of the Na-
20 tional Aeronautics and Space Administration Authoriza-
21 tion Act of 2010 (42 U.S.C. 18322(c)(2)), the Adminis-
22 trator shall continue development of the Exploration
23 Upper Stage for the Space Launch System with a sched-
24 uled availability sufficient for use on the third launch of
25 the Space Launch System.

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

6 (d) MAIN PROPULSION TEST ARTICLE.—To meet the
7 requirements under section 302(c)(3) of the National Aer-
8 onautics and Space Administration Authorization Act of
9 2010 (42 U.S.C. 18322(c)(3)), the Administrator shall—

10 (1) immediately on completion of the first full-
11 duration integrated core stage test of the Space
12 Launch System, initiate development of a main pro-
13 pulsion test article for the integrated core stage pro-
14 pulsion elements of the Space Launch System, con-
15 sistent with cost and schedule constraints, particu-
16 larly for long-lead propulsion hardware needed for
17 flight;

18 (2) not later than 180 days after the date of
19 the enactment of this Act, submit to the appropriate
20 committees of Congress a detailed plan for the devel-
21 opment and operation of such main propulsion test
22 article; and

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

1 **SEC. 203. ADVANCED SPACESUITS.**

2 (a) SENSE OF CONGRESS.—It is the sense of Con-
3 gress that next-generation advanced spacesuits are a crit-
4 ical technology for human space exploration and use of
5 low-Earth orbit, cislunar space, the surface of the Moon,
6 and Mars.

7 (b) DEVELOPMENT PLAN.—The Administrator shall
8 establish a detailed plan for the development and manu-
9 facture of advanced spacesuits, consistent with the deep
10 space exploration goals and timetables of NASA.

11 (c) DIVERSE ASTRONAUT CORPS.—The Adminis-
12 trator shall ensure that spacesuits developed and manufac-
13 tured after the date of the enactment of this Act are capa-
14 ble of accommodating a wide range of sizes of astronauts
15 so as to meet the needs of the diverse NASA astronaut
16 corps.

17 (d) ISS USE.—Throughout the operational life of the
18 ISS, the Administrator should fully use the ISS for testing
19 advanced spacesuits.

20 (e) PRIOR INVESTMENTS.—

21 (1) IN GENERAL.—In developing an advanced
22 spacesuit, the Administrator shall, to the maximum
23 extent practicable, partner with industry-proven
24 spacesuit design, development, and manufacturing
25 suppliers and leverage prior and existing investments
26 in advanced spacesuit technologies and existing ca-

1 pabilities at NASA centers to maximize the benefits
2 of such investments and technologies.

3 (2) AGREEMENTS WITH PRIVATE ENTITIES.—In
4 carrying out this subsection, the Administrator may
5 enter into 1 or more agreements with 1 or more pri-
6 vate entities for the manufacture of advanced
7 spacesuits, as the Administrator considers appro-
8 priate.

9 (f) BRIEFING.—Not later than 180 days after the
10 date of the enactment of this Act, and semiannually there-
11 after until NASA procures advanced spacesuits under this
12 section, the Administrator shall brief the appropriate com-
13 mittees of Congress on the development plan in subsection
14 (b).

15 **SEC. 204. ACQUISITION OF DOMESTIC SPACE TRANSPOR-**
16 **TATION AND LOGISTICS RESUPPLY SERV-**
17 **ICES.**

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

23 (1) the ISS; or

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

4 (b) EXCEPTION.—The Administrator may enter into
5 a contract with a person or an entity that proposes to use,
6 or will use, a foreign launch provider for a commercial
7 service to carry out an activity described in subsection (a)
8 if—

9 (1) a domestic vehicle or service is unavailable;
10 or

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

14 (c) RULE OF CONSTRUCTION.—Nothing in this sec-
15 tion shall be construed to prohibit the Administrator from
16 entering into 1 or more no-exchange-of-funds collaborative
17 agreements with an international partner in support of the
18 deep space exploration plan of NASA.

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

20 (a) IN GENERAL.—The Administrator shall continue
21 to carry out a program to modernize rocket propulsion test
22 infrastructure at NASA facilities—

23 (1) to increase capabilities;

24 (2) to enhance safety;

1 (3) to support propulsion development and test-
2 ing; and

3 (4) to foster the improvement of Government
4 and commercial space transportation and explo-
5 ration.

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

8 (1) infrastructure and other facilities and sys-
9 tems relating to rocket propulsion test stands and
10 rocket propulsion testing;

11 (2) enhancements to test facility capacity and
12 flexibility; and

13 (3) such other projects as the Administrator
14 considers appropriate to meet the goals described in
15 that subsection.

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

18 (1) prioritize investments in projects that en-
19 hance test and flight certification capabilities for
20 large thrust-level atmospheric and altitude engines
21 and engine systems, and multi-engine integrated test
22 capabilities;

23 (2) continue to make underutilized test facilities
24 available for commercial use on a reimbursable
25 basis; and

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

5 (A) the Space Launch System and the Ex-
6 ploration Upper Stage of the Space Launch
7 System;

8 (B) in-space propulsion to support explo-
9 ration missions; or

10 (C) nuclear propulsion testing.

11 (d) RULE OF CONSTRUCTION.—Nothing in this sec-
12 tion shall preclude a NASA program, including the Space
13 Launch System and the Exploration Upper Stage of the
14 Space Launch System, from using the modernized test in-
15 frastructure developed under this section.

16 (e) WORKING CAPITAL FUND STUDY.—

17 (1) IN GENERAL.—Not later than 180 days
18 after the date of the enactment of this Act, the Ad-
19 ministrator shall submit to the appropriate commit-
20 tees of Congress a report on the use of the authority
21 under section 30102 of title 51, United States Code,
22 to promote increased use of NASA rocket propulsion
23 test infrastructure for research, development, test-
24 ing, and evaluation activities by other Federal agen-

1 cies, firms, associations, corporations, and edu-
2 cational institutions.

3 (2) MATTERS TO BE INCLUDED.—The report
4 required by paragraph (1) shall include the fol-
5 lowing:

6 (A) An assessment of prior use, if any, of
7 the authority under section 30102 of title 51,
8 United States Code, to improve testing infra-
9 structure.

10 (B) An analysis of any barrier to imple-
11 mentation of such authority for the purpose of
12 promoting increased use of NASA rocket pro-
13 pulsion test infrastructure.

14 **SEC. 206. INDIAN RIVER BRIDGE.**

15 (a) IN GENERAL.—The Administrator, in coordina-
16 tion with the heads of other Federal agencies that use the
17 Indian River Bridge on the NASA Causeway, shall develop
18 a plan to ensure that a bridge over the Indian River at
19 such location provides access to the Eastern Range for na-
20 tional security, civil, and commercial space operations.

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

1 **SEC. 207. PEARL RIVER MAINTENANCE.**

2 (a) IN GENERAL.—The Administrator shall coordi-
3 nate with the Chief of the Army Corps of Engineers to
4 ensure the continued navigability of the Pearl River and
5 Little Lake channels sufficient to support NASA barge op-
6 erations surrounding Stennis Space Center and the
7 Michoud Assembly Facility.

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

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

15 (1) the Committee on Commerce, Science, and
16 Transportation, the Committee on Environment and
17 Public Works, and the Committee on Appropriations
18 of the Senate; and

19 (2) the Committee on Science, Space, and
20 Technology, the Committee on Transportation and
21 Infrastructure, and the Committee on Appropria-
22 tions of the House of Representatives.

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

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

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

4 (2) low-Earth orbit should be used as a test bed
5 to advance human space exploration and scientific
6 discoveries; and

7 (3) the ISS is a critical component of economic,
8 commercial, and industrial development in low-Earth
9 orbit.

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

14 **SEC. 209. EXTENSION AND MODIFICATION RELATING TO**
15 **INTERNATIONAL SPACE STATION.**

16 (a) POLICY.—Section 501(a) of the National Aero-
17 nautics and Space Administration Authorization Act of
18 2010 (42 U.S.C. 18351(a)) is amended by striking
19 “2024” and inserting “2030”.

20 (b) MAINTENANCE OF UNITED STATES SEGMENT
21 AND ASSURANCE OF CONTINUED OPERATIONS.—Section
22 503(a) of the National Aeronautics and Space Administra-
23 tion Authorization Act of 2010 (42 U.S.C. 18353(a)) is
24 amended by striking “September 30, 2024” and inserting
25 “September 30, 2030”.

1 (c) RESEARCH CAPACITY ALLOCATION AND INTE-
2 GRATION OF RESEARCH PAYLOADS.—Section 504(d) of
3 the National Aeronautics and Space Administration Au-
4 thorization Act of 2010 (42 U.S.C. 18354(d)) is amend-
5 ed—

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

7 (A) by striking “As soon as practicable”
8 and all that follows through “2011,” and in-
9 serting “The”; and

10 (B) by striking “September 30, 2024” and
11 inserting “September 30, 2030”; and

12 (2) in paragraph (2), in the third sentence, by
13 striking “September 30, 2024” and inserting “Sep-
14 tember 30, 2030”.

15 (d) MAINTENANCE OF USE.—

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

18 (A) in the section heading, by striking
19 “**2024**” and inserting “**2030**”;

20 (B) in subsection (a), by striking “Sep-
21 tember 30, 2024” and inserting “September 30,
22 2030”; and

23 (C) in subsection (b)(3), by striking “Sep-
24 tember 30, 2024” and inserting “September 30,
25 2030”.

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

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

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

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

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

12 (1) by redesignating section 70907 as section
13 70906; and

14 (2) in the table of sections for the chapter, by
15 striking the items relating to sections 70906 and
16 70907 and inserting the following:

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

17 **SEC. 210. DEPARTMENT OF DEFENSE ACTIVITIES ON**
18 **INTERNATIONAL SPACE STATION.**

19 (a) IN GENERAL.—Not later than 180 days after the
20 date of the enactment of this Act, the Secretary of Defense
21 shall—

22 (1) identify and review each activity, program,
23 and project of the Department of Defense com-
24 pleted, being carried out, or planned to be carried
25 out on the ISS as of the date of the review; and

1 (2) provide to the appropriate committees of
2 Congress a briefing that describes the results of the
3 review.

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

7 (1) the Committee on Armed Services, the
8 Committee on Appropriations, and the Committee on
9 Commerce, Science, and Transportation of the Sen-
10 ate; and

11 (2) the Committee on Armed Services, the
12 Committee on Appropriations, and the Committee on
13 Science, Space, and Technology of the House of
14 Representatives.

15 **SEC. 211. COMMERCIAL DEVELOPMENT IN LOW-EARTH**
16 **ORBIT.**

17 (a) STATEMENT OF POLICY.—It is the policy of the
18 United States to encourage the development of a thriving
19 and robust United States commercial sector in low-Earth
20 orbit.

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

1 (c) NONCOMPETITION.—

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

8 (2) EXCEPTION.—The Administrator may offer
9 a spaceflight product or service relating to the ISS
10 to the government of a country that is a signatory
11 to the Agreement Among the Government of Can-
12 ada, Governments of Member States of the Euro-
13 pean Space Agency, the Government of Japan, the
14 Government of the Russian Federation, and the
15 Government of the United States of America Con-
16 cerning Cooperation on the Civil International Space
17 Station, signed at Washington January 29, 1998,
18 and entered into force on March 27, 2001 (TIAS
19 12927), including an international partner astronaut
20 (as defined in section 50902 of title 51, United
21 States Code) that is sponsored by the government of
22 such a country.

23 (d) SHORT-DURATION COMMERCIAL MISSIONS.—To
24 provide opportunities for additional transport of astro-
25 nauts to the ISS and help establish a commercial market

1 in low-Earth orbit, the Administrator may permit short-
2 duration missions to the ISS for commercial passengers
3 on a fully or partially reimbursable basis.

4 (e) PROGRAM AUTHORIZATION.—

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

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

13 (A) to stimulate demand for—

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

16 (ii) spaceflight products and services;

17 and

18 (iii) human spaceflight products and
19 services in low-Earth orbit;

20 (B) to improve the capability of the ISS to
21 accommodate commercial users; and

22 (C) subject to paragraph (3), to foster the
23 development of commercial space stations and
24 habitats.

1 (3) COMMERCIAL SPACE STATIONS AND HABI-
2 TATS.—

3 (A) PRIORITY.—With respect to an activity
4 to develop a commercial space station or habi-
5 tat, the Administrator shall give priority to an
6 activity for which a private entity provides a
7 significant share of the cost to develop and op-
8 erate the activity.

9 (B) REPORT.—Not later than 30 days
10 after the date that an award or agreement is
11 made to carry out an activity to develop a com-
12 mercial space station or habitat, the Adminis-
13 trator shall submit to the appropriate commit-
14 tees of Congress a report on the development of
15 the commercial space station or habitat, as ap-
16 plicable, that includes—

17 (i) a business plan that describes the
18 manner in which the project will—

19 (I) meet the future requirements
20 of NASA for low-Earth orbit human
21 space-flight services; and

22 (II) fulfill the cost-share funding
23 prioritization under subparagraph (A);
24 and

1 (ii) a review of the viability of the
2 operational business case, including—

3 (I) the level of expected Govern-
4 ment participation;

5 (II) a list of anticipated non-
6 governmental an international cus-
7 tomers and associated contributions;
8 and

9 (III) an assessment of long-term
10 sustainability for the nongovernmental
11 customers, including an independent
12 assessment of the viability of the mar-
13 ket for such commercial services or
14 products.

15 **SEC. 212. MAINTAINING A NATIONAL LABORATORY IN**
16 **SPACE.**

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

19 (1) the United States segment of the Inter-
20 national Space Station (as defined in section 70905
21 of title 51, United States Code), which is designated
22 as a national laboratory under section 70905(b) of
23 title 51, United States Code—

24 (A) benefits the scientific community and
25 promotes commerce in space;

1 (B) fosters stronger relationships among
2 NASA and other Federal agencies, the private
3 sector, and research groups and universities;

4 (C) advances science, technology, engineer-
5 ing, and mathematics education through use of
6 the unique microgravity environment; and

7 (D) advances human knowledge and inter-
8 national cooperation;

9 (2) after the ISS is decommissioned, the United
10 States should maintain a national microgravity lab-
11 oratory in space;

12 (3) in maintaining a national microgravity lab-
13 oratory in space, the United States should make ap-
14 propriate accommodations for different types of own-
15 ership and operation arrangements for the ISS and
16 future space stations;

17 (4) to the maximum extent practicable, a na-
18 tional microgravity laboratory in space should be
19 maintained in cooperation with international space
20 partners; and

21 (5) NASA should continue to support funda-
22 mental science research on future platforms in low-
23 Earth orbit and cislunar space, orbital and sub-
24 orbital flights, drop towers, and other microgravity
25 testing environments.

1 (b) REPORT.—The Administrator, in coordination
2 with the National Space Council and other Federal agen-
3 cies as the Administrator considers appropriate, shall
4 issue a report detailing the feasibility of establishing a
5 microgravity national laboratory federally funded research
6 and development center to carry out activities relating to
7 the study and use of in-space conditions.

8 **SEC. 213. INTERNATIONAL SPACE STATION NATIONAL LAB-**
9 **ORATORY; PROPERTY RIGHTS IN INVEN-**
10 **TIONS.**

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

14 **“§ 20150. Property rights in designated inventions**

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

20 “(1)(A) the Administration is reimbursed under
21 the terms of the contract for the full cost of a con-
22 tribution by the Federal Government of the use of
23 Federal facilities, equipment, materials, proprietary
24 information of the Federal Government, or services
25 of a Federal employee during working hours, includ-

1 ing the cost for the Administration to carry out its
2 responsibilities under paragraphs (1) and (4) of sec-
3 tion 504(d) of the National Aeronautics and Space
4 Administration Authorization Act of 2010 (42
5 U.S.C. 18354(d));

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

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

10 “(i) solely by the user; or

11 “(ii)(I) by the user with the services of a
12 Federal employee under the terms of the con-
13 tract; and

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

16 “(2) the Administrator determines that the rel-
17 evant field of commercial endeavor is sufficiently im-
18 mature that granting exclusive property rights to the
19 user is necessary to help bolster demand for prod-
20 ucts and services produced on crewed or crew-tended
21 space stations.

22 “(b) NOTIFICATION TO CONGRESS.—On completion
23 of a determination made under paragraph (2), the Admin-
24 istrator shall submit to the appropriate committees of

1 Congress a notification of the determination that includes
2 a written justification.

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

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

14 “(e) DEFINITIONS.—In this section—

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

17 “(2) DESIGNATED ACTIVITY.—The term ‘des-
18 ignated activity’ means any non-NASA scientific use
19 of the ISS national laboratory as described in sec-
20 tion 504 of the National Aeronautics and Space Ad-
21 ministration Authorization Act of 2010 (42 U.S.C.
22 18354).

23 “(3) DESIGNATED INVENTION.—The term ‘des-
24 ignated invention’ means any invention, product, or
25 service conceived or first reduced to practice by any

1 person in the performance of a designated activity
2 under a written contract with the Administration or
3 the ISS management entity.

4 “(4) FULL COST.—The term ‘full cost’ means
5 the cost of transporting materials or passengers to
6 and from the ISS, including any power needs, the
7 disposal of mass, crew member time, stowage, power
8 on the ISS, data downlink, crew consumables, and
9 life support.

10 “(5) GOVERNMENT-PURPOSE LICENSE.—The
11 term ‘Government-purpose license’ means the res-
12 ervation by the Federal Government of an irrev-
13 ocable, nonexclusive, nontransferable, royalty-free li-
14 cense for the use of an invention throughout the
15 world by or on behalf of the United States or any
16 foreign government pursuant to a treaty or agree-
17 ment with the United States.

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

24 “(7) USER.—The term ‘user’ means a person,
25 including a nonprofit organization or small business

1 firm (as such terms are defined in section 201 of
2 title 35), or class of persons that enters into a writ-
3 ten contract with the Administration or the ISS
4 management entity for the performance of des-
5 ignated activities.”.

6 (b) CONFORMING AMENDMENT.—The table of sec-
7 tions for chapter 201 of title 51, United States Code, is
8 amended by inserting after the item relating to section
9 20149 the following:

“20150. Property rights in designated inventions.”.

10 **SEC. 214. DATA FIRST PRODUCED DURING NON-NASA SCI-**
11 **ENTIFIC USE OF THE ISS NATIONAL LABORA-**
12 **TORY.**

13 (a) DATA RIGHTS.—Subchapter III of chapter 201
14 of title 51, United States Code, as amended by section
15 213, is further amended by adding at the end the fol-
16 lowing:

17 **“§ 20151. Data rights**

18 “(a) NON-NASA SCIENTIFIC USE OF THE ISS NA-
19 TIONAL LABORATORY.—The Federal Government may not
20 use or reproduce, or disclose outside of the Government,
21 any data first produced in the performance of a designated
22 activity under a written contract with the Administration
23 or the ISS management entity, unless—

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

4 “(2) the designated activity is carried out with
5 Federal funds;

6 “(3) disclosure is required by law;

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

10 “(5) the data is—

11 “(A) otherwise lawfully acquired or inde-
12 pendently developed by the Federal Govern-
13 ment;

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

16 “(C) essential to the performance of work
17 by the ISS management entity or NASA per-
18 sonnel.

19 “(b) DEFINITIONS.—In this section:

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

22 “(2) DATA.—

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

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

3 “(C) EXCLUSIONS.—The term ‘data’ does
4 not include information incidental to contract
5 administration, such as financial, administra-
6 tive, cost or pricing, or management informa-
7 tion.

8 “(3) DESIGNATED ACTIVITY.—The term ‘des-
9 ignated activity’ has the meaning given the term in
10 section 20150.

11 “(4) ISS MANAGEMENT ENTITY.—The term
12 ‘ISS management entity’ has the meaning given the
13 term in section 20150.”.

14 (b) SPECIAL HANDLING OF TRADE SECRETS OR
15 CONFIDENTIAL INFORMATION.—Section 20131(b)(2) of
16 title 51, United States Code, is amended to read as fol-
17 lows:

18 “(2) INFORMATION DESCRIBED.—

19 “(A) ACTIVITIES UNDER AGREEMENT.—
20 Information referred to in paragraph (1) is in-
21 formation that—

22 “(i) results from activities conducted
23 under an agreement entered into under
24 subsections (e) and (f) of section 20113;
25 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 in-
5 formation had been obtained from a non-
6 Federal party participating in such an
7 agreement.

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

11 “(i) was first produced by the Admin-
12 istration in the performance of any des-
13 ignated activity (as defined in section
14 20150); and

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

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

“20151. Data rights.”.

1 **SEC. 215. PAYMENTS RECEIVED FOR COMMERCIAL SPACE-**
2 **ENABLED PRODUCTION ON THE ISS.**

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

5 (1) the Administrator should determine a
6 threshold for NASA to recover the costs of sup-
7 porting the commercial development of products or
8 services aboard the ISS, through the negotiation of
9 agreements, similar to agreements made by other
10 Federal agencies that support private sector innova-
11 tion; and

12 (2) the amount of such costs that to be recov-
13 ered or profits collected through such agreements
14 should be applied by the Administrator through a
15 tiered process, taking into consideration the relative
16 maturity and profitability of the applicable product
17 or service.

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

21 **“§ 20152. Payments received for commercial space-en-**
22 **able production**

23 **“(a) ANNUAL REVIEW.—**

24 **“(1) IN GENERAL.—**Not later than one year
25 after the date of the enactment of this section, and
26 annually thereafter, the Administrator shall review

1 the profitability of any partnership with a private
2 entity under a contract in which the Adminis-
3 trator—

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

7 “(B) provides the total unreimbursed cost
8 of a contribution by the Federal Government
9 for the use of Federal facilities, equipment, ma-
10 terials, proprietary information of the Federal
11 Government, or services of a Federal employee
12 during working hours, including the cost for the
13 Administration to carry out its responsibilities
14 under paragraphs (1) and (4) of section 504(d)
15 of the National Aeronautics and Space Admin-
16 istration Authorization Act of 2010 (42 U.S.C.
17 18354(d)).

18 “(2) NEGOTIATION OF REIMBURSEMENTS.—
19 Subject to the review described in paragraph (1), the
20 Administrator shall seek to enter into an agreement
21 to negotiate reimbursements for payments received,
22 or portions of profits created, by any mature, profit-
23 able private entity described in that paragraph, as
24 appropriate, through a tiered process that reflects
25 the profitability of the relevant product or service.

1 “(3) USE OF FUNDS.—Amounts received by the
2 Administrator in accordance with an agreement
3 under paragraph (2) shall be used by the Adminis-
4 trator in the following order of priority:

5 “(A) To defray the operating cost of the
6 ISS.

7 “(B) To develop, implement, or operate fu-
8 ture low-Earth orbit platforms or capabilities.

9 “(C) To develop, implement, or operate fu-
10 ture human deep space platforms or capabili-
11 ties.

12 “(D) Any other costs the Administrator
13 considers appropriate.

14 “(4) REPORT.—On completion of the first an-
15 nual review under paragraph (1), and annually
16 thereafter, the Administrator shall submit to the ap-
17 propriate committees of Congress a report that in-
18 cludes a description of the results of the annual re-
19 view, any agreement entered into under this section,
20 and the amounts recouped or obtained under any
21 such agreement.

22 “(b) LICENSING AND ASSIGNMENT OF INVEN-
23 TIONS.—Notwithstanding sections 3710a and 3710c of
24 title 15 and any other provision of law, after payment in
25 accordance with subsection (A)(i) of such section

1 3710c(a)(1)(A)(i) to the inventors who have directly as-
2 signed to the Federal Government their interests in an in-
3 vention under a written contract with the Administration
4 or the ISS management entity for the performance of a
5 designated activity, the balance of any royalty or other
6 payment received by the Administrator or the ISS man-
7 agement entity from licensing and assignment of such in-
8 vention shall be paid by the Administrator or the ISS
9 management entity, as applicable, to the Space Explo-
10 ration Fund.

11 “(c) SPACE EXPLORATION FUND.—

12 “(1) ESTABLISHMENT.—There is established in
13 the Treasury of the United States a fund, to be
14 known as the ‘Space Exploration Fund’ (referred to
15 in this subsection as the ‘Fund’), to be administered
16 by the Administrator.

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

20 “(3) DEPOSITS.—There shall be deposited in
21 the Fund—

22 “(A) amounts appropriated to the Fund;

23 “(B) fees and royalties collected by the Ad-
24 ministrator or the ISS management entity
25 under subsections (a) and (b); and

1 “(C) donations or contributions designated
2 to support authorized activities.

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

6 “(A) in addition to amounts otherwise
7 made available for the purpose described in
8 paragraph (2); and

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

12 “(d) DEFINITIONS.—

13 “(1) IN GENERAL.—In this section, any term
14 used in this section that is also used in section
15 20150 shall have the meaning given the term in that
16 section.

17 “(2) APPROPRIATE COMMITTEES OF CON-
18 GRESS.—The term ‘appropriate committees of Con-
19 gress’ means—

20 “(A) the Committee on Commerce,
21 Science, and Transportation and the Committee
22 on Appropriations of the Senate; and

23 “(B) the Committee on Science, Space,
24 and Technology and the Committee on Appro-
25 priations of the House of Representatives.”.

1 (c) CONFORMING AMENDMENT.—The table of sec-
2 tions for chapter 201 of title 51, United States Code, as
3 amended by section and 214, is further amended by insert-
4 ing after the item relating to section 20151 the following:
“20152. Payments received for commercial space-enabled production.”.

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

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

8 **“§ 70504. Stepping stone approach to exploration**

9 “(a) IN GENERAL.—The Administrator, in sustain-
10 able steps, may conduct missions to intermediate destina-
11 tions, such as the Moon, in accordance with section
12 20302(b), and on a timetable determined by the avail-
13 ability of funding, in order to achieve the objective of
14 human exploration of Mars specified in section 202(b)(5)
15 of the National Aeronautics and Space Administration Au-
16 thorization Act of 2010 (42 U.S.C. 18312(b)(5)), if the
17 Administrator—

18 “(1) determines that each such mission dem-
19 onstrates or advances a technology or operational
20 concept that will enable human missions to Mars;
21 and

22 “(2) incorporates each such mission into the
23 human exploration roadmap under section 432 of
24 the National Aeronautics and Space Administration

1 Transition Authorization Act of 2017 (Public Law
2 115–10; 51 U.S.C. 20302 note).

3 “(b) CISLUNAR SPACE EXPLORATION ACTIVITIES.—

4 In conducting a mission under subsection (a), the Admin-
5 istrator shall—

6 “(1) use a combination of launches of the Space
7 Launch System and space transportation services
8 from United States commercial providers, as appro-
9 priate, for the mission;

10 “(2) plan for not fewer than 1 Space Launch
11 System launch annually beginning after the first
12 successful crewed launch of Orion on the Space
13 Launch System; and

14 “(3) establish an outpost in orbit around the
15 Moon that—

16 “(A) demonstrates technologies, systems,
17 and operational concepts directly applicable to
18 the space vehicle that will be used to transport
19 humans to Mars;

20 “(B) has the capability for periodic human
21 habitation; and

22 “(C) can function as a point of departure,
23 return, or staging for Administration or non-
24 governmental or international partner missions

1 to multiple locations on the lunar surface or
2 other destinations.

3 “(c) COST-EFFECTIVENESS.—To maximize the cost-
4 effectiveness of the long-term space exploration and utili-
5 zation activities of the United States, the Administrator
6 shall take all necessary steps, including engaging non-
7 governmental and international partners, to ensure that
8 activities in the Administration’s human space exploration
9 program are balanced in order to help meet the require-
10 ments of future exploration and utilization activities lead-
11 ing to human habitation on the surface of Mars.

12 “(d) COMPLETION.—Within budgetary consider-
13 ations, once an exploration-related project enters its devel-
14 opment phase, the Administrator shall seek, to the max-
15 imum extent practicable, to complete that project without
16 undue delay.

17 “(e) INTERNATIONAL PARTICIPATION.—To achieve
18 the goal of successfully conducting a crewed mission to
19 the surface of Mars, the Administrator shall invite the
20 partners in the ISS program and other nations, as appro-
21 priate, to participate in an international initiative under
22 the leadership of the United States.”.

23 (b) DEFINITION OF CISLUNAR SPACE.—Section
24 10101 of title 51, United States Code, is amended by add-
25 ing at the end the following:

1 “(3) CISLUNAR 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 (c) TECHNICAL AND CONFORMING AMENDMENTS.—
6 Section 3 of the National Aeronautics and Space Adminis-
7 tration Authorization Act of 2010 (42 U.S.C. 18302) is
8 amended by striking paragraphs (2) and (3) and inserting
9 the following:

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

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

15 “(B) the Committee on Science, Space,
16 and Technology of the House of Representa-
17 tives.

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

1 **SEC. 217. TECHNICAL AMENDMENTS RELATING TO**
2 **ARTEMIS MISSIONS.**

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

6 (1) in subsection (c)(3)—

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

9 (B) by striking “EM–2” and inserting
10 “Artemis II”; and

11 (C) by striking “EM–3” and inserting
12 “Artemis III”; and

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

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

18 (1) in paragraph (3)(D)—

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

21 (B) by striking “EM–2” and inserting
22 “Artemis II”; and

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

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

8 **SEC. 302. LUNAR DISCOVERY PROGRAM.**

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

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

19 (c) LUNAR SCIENCE RESEARCH.—The Administrator
20 shall ensure that lunar science research carried out under
21 subsection (a) is consistent with recommendations made
22 by the National Academies of Sciences, Engineering, and
23 Medicine.

24 (d) LUNAR POLAR VOLATILES.—In carrying out the
25 program under subsection (a), the Administrator shall, at

1 the earliest opportunity, consider mission proposals to
2 evaluate the potential of lunar polar volatiles to contribute
3 to sustainable lunar exploration.

4 **SEC. 303. SEARCH FOR LIFE.**

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

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

14 (2) the interaction of lifeforms with their envi-
15 ronment, a central focus of astrobiology research, is
16 a topic of broad significance to life sciences research
17 in space and on Earth.

18 (b) PROGRAM CONTINUATION.—

19 (1) IN GENERAL.—The Administrator shall con-
20 tinue to implement a collaborative, multidisciplinary
21 science and technology development program to
22 search for proof of the existence or historical exist-
23 ence of life beyond Earth in support of the objective
24 described in section 20102(d)(10) of title 51, United
25 States Code.

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

4 (3) COORDINATION WITH LIFE SCIENCES PRO-
5 GRAM.—In carrying out the program under para-
6 graph (1), the Administrator shall coordinate efforts
7 with the life sciences program of the Administration.

8 (4) TECHNOSIGNATURES.—In carrying out the
9 program under paragraph (1), the Administrator
10 shall support activities to search for and analyze
11 technosignatures.

12 (5) INSTRUMENTATION AND SENSOR TECH-
13 NOLOGY.—In carrying out the program under para-
14 graph (1), the Administrator may strategically invest
15 in the development of new instrumentation and sen-
16 sor technology.

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

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

20 (1) the James Webb Space Telescope will be
21 the next premier observatory in space and has great
22 potential to further scientific study and assist sci-
23 entists in making new discoveries in the field of as-
24 tronomy;

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

5 (3) despite the major technology development
6 and innovation that was needed to construct the
7 James Webb Space Telescope, major negative im-
8 pacts to the cost and schedule of the James Webb
9 Space Telescope resulted from poor program man-
10 agement and poor contractor performance;

11 (4) the Administrator should take into account
12 the lessons learned from the cost and schedule issues
13 relating to the development of the James Webb
14 Space Telescope in making decisions regarding the
15 scope of and the technologies needed for future sci-
16 entific missions; and

17 (5) in selecting future scientific missions, the
18 Administrator should take into account the impact
19 that large programs that overrun cost and schedule
20 estimates may have on other NASA programs in
21 earlier phases of development.

22 (b) PROJECT CONTINUATION.—The Administrator
23 shall continue—

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

4 (2) to improve the reliability of cost estimates
5 and contractor performance data throughout the re-
6 maining development of the James Webb Space Tel-
7 escope.

8 (c) REVISED ESTIMATE.—Due to delays to the James
9 Webb Space Telescope project resulting from the COVID-
10 19 pandemic, the Administrator shall provide to Con-
11 gress—

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

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

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

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

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

22 (2) the Administrator should continue to de-
23 velop the Wide-Field Infrared Survey Telescope with
24 a development cost of not more than
25 \$3,200,000,000.

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

8 **SEC. 306. STUDY ON SATELLITE SERVICING FOR SCIENCE**
9 **MISSIONS.**

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

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

18 (1) An identification of the technologies and in-
19 space testing required to demonstrate the in-space
20 robotic refueling, repair, or refurbishment capabili-
21 ties described in that subsection.

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

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

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

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

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

13 (1) to collect and use Earth observations in
14 service to society; and

15 (2) to understand global change.

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

24 (1) the science priorities described in such sur-
25 vey;

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

4 (3) the development of a range of missions of
5 all classes, including opportunities for principal in-
6 vestigator-led, competitively selected missions.

7 **SEC. 308. LIFE SCIENCE AND PHYSICAL SCIENCE RE-**
8 **SEARCH.**

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

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

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

18 (B) many areas of basic and applied sci-
19 entific research that could use the microgravity,
20 radiation, and other aspects of the spaceflight
21 environment to answer fundamental scientific
22 questions;

23 (2) given the central role of life science and
24 physical science research in developing the future of
25 space exploration, NASA should continue to invest

1 strategically in such research to maintain United
2 States leadership in space exploration; and

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

6 (b) PROGRAM CONTINUATION.—

7 (1) IN GENERAL.—In support of the goals de-
8 scribed in section 20302 of title 51, United States
9 Code, the Administrator shall continue to implement
10 a collaborative, multidisciplinary life science and
11 physical science fundamental research program—

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

14 (B) to investigate the mechanisms of
15 changes to biological systems and physical sys-
16 tems, and the environments of those systems in
17 space, including the effects of long-duration ex-
18 posure to deep space-related environmental fac-
19 tors on those systems;

20 (C) to understand the effects of combined
21 deep space radiation and altered gravity levels
22 on biological systems so as to inform the devel-
23 opment and testing of potential counter-
24 measures;

1 (D) to understand physical phenomena in
2 reduced gravity that affect design and perform-
3 ance of enabling technologies necessary for the
4 space exploration program;

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

8 (F) to provide state-of-the-art data reposi-
9 tories and curation of large multi-data sets to
10 enable comparative research analyses.

11 (2) ELEMENTS.—The program under para-
12 graph (1) shall—

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

16 (B) maximize intra-agency and interagency
17 partnerships to advance space exploration, sci-
18 entific knowledge, and benefits to Earth.

19 (3) USE OF FACILITIES.—In carrying out the
20 program under paragraph (1), the Administrator
21 may use ground-based, air-based, and space-based
22 facilities in low-Earth orbit and beyond low-Earth
23 orbit.

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

2 (a) IN GENERAL.—The Administrator shall conduct
3 1 or more science missions to Mars to enable the selection
4 of 1 or more sites for human landing.

5 (b) SAMPLE PROGRAM.—The Administrator may
6 carry out a program—

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

8 and

9 (2) to return such samples to Earth for sci-
10 entific analysis.

11 (c) USE OF EXISTING CAPABILITIES AND ASSETS.—

12 In carrying out this section, the Administrator shall, to
13 the maximum extent practicable, use existing capabilities
14 and assets of NASA centers.

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

16 (a) FINDINGS.—Congress makes the following find-
17 ings:

18 (1) Near-Earth objects remain a threat to the
19 United States.

20 (2) Section 321(d)(1) of the National Aero-
21 nautics and Space Administration Authorization Act
22 of 2005 (Public Law 109–155; 119 Stat. 2922; 51
23 U.S.C. 71101 note prec.) established a requirement
24 that the Administrator plan, develop, and implement
25 a Near-Earth Object Survey program to detect,
26 track, catalogue, and characterize the physical char-

1 characteristics of near-Earth objects equal to or greater
2 than 140 meters in diameter in order to assess the
3 threat of such near-Earth objects to the Earth, with
4 the goal of 90-percent completion of the catalogue of
5 such near-Earth objects by December 30, 2020.

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

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

13 (A) NASA cannot accomplish such goal
14 with currently available assets;

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

22 (C) the early detection of potentially haz-
23 ardous near-Earth objects enabled by a space-
24 based infrared survey telescope is important to
25 enable deflection of a dangerous asteroid.

1 (b) ESTABLISHMENT OF PLANETARY DEFENSE CO-
2 ORDINATION OFFICE.—

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

15 (2) ACTIVITIES.—The Administrator shall—

16 (A) develop and, not later than September
17 30, 2025, launch a space-based infrared survey
18 telescope that is capable of detecting near-
19 Earth objects equal to or greater than 140 me-
20 ters in diameter, with preference given to plan-
21 etary missions selected by the Administrator as
22 of the date of the enactment of this Act to pur-
23 sue concept design studies relating to the devel-
24 opment of a space-based infrared survey tele-
25 scope;

1 (B) identify, track, and characterize poten-
2 tially hazardous near-Earth objects and issue
3 warnings of the effects of potential impacts of
4 such objects; and

5 (C) assist in coordinating Government
6 planning for response to a potential impact of
7 a near-Earth object.

8 (e) ANNUAL REPORT.—Section 321(f) of the Na-
9 tional Aeronautics and Space Administration Authoriza-
10 tion Act of 2005 (Public Law 109–155; 119 Stat. 2922;
11 51 U.S.C. 71101 note prec.) is amended to read as fol-
12 lows:

13 “(f) ANNUAL REPORT.—Not later than 180 days
14 after the date of the enactment of the National Aero-
15 nautics and Space Administration Authorization Act of
16 2020, and annually thereafter through 90-percent comple-
17 tion of the catalogue required by subsection (d)(1), the
18 Administrator shall submit to the Committee on Com-
19 merce, Science, and Transportation of the Senate and the
20 Committee on Science, Space, and Technology of the
21 House of Representatives a report that includes the fol-
22 lowing:

23 “(1) A summary of all activities carried out by
24 the Planetary Defense Coordination Office estab-
25 lished under section 310(b)(1) of the National Aero-

1 nautics and Space Administration Authorization Act
2 of 2020 since the date of enactment of that Act.

3 “(2) A description of the progress with respect
4 to the design, development, and launch of the space-
5 based infrared survey telescope required by section
6 310(b)(2)(A) of the National Aeronautics and Space
7 Administration Authorization Act of 2020.

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

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

16 “(5) A description of the status of efforts to co-
17 ordinate and cooperate with other countries to dis-
18 cover hazardous asteroids and comets, plan a mitiga-
19 tion strategy, and implement that strategy in the
20 event of the discovery of an object on a likely colli-
21 sion course with Earth.

22 “(6) A summary of expenditures for all activi-
23 ties carried out by the Planetary Defense Coordina-
24 tion Office since the date of enactment of the Na-

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

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

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

16 **SEC. 311. SUBORBITAL SCIENCE FLIGHTS.**

17 (a) **SENSE OF CONGRESS.**—It is the sense of Con-
18 gress that commercially available suborbital flight plat-
19 forms enable low-cost access to a microgravity environ-
20 ment to advance science and train scientists and engineers
21 under the Suborbital Research Program established under
22 section 802(c) of the National Aeronautics and Space Ad-
23 ministration Authorization Act of 2010 (42 U.S.C.
24 18382(c)).

25 (b) **REPORT.**—

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

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

11 (A) An assessment of the advantages of
12 suborbital flight platforms to meet science ob-
13 jectives.

14 (B) An evaluation of the challenges to
15 greater use of commercial suborbital flight plat-
16 forms for science purposes.

17 (C) An analysis of whether commercial
18 suborbital flight platforms can provide low-cost
19 flight opportunities to test lunar and Mars
20 science payloads.

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

22 (a) IN GENERAL.—The Administrator shall to the
23 maximum extent practicable, make available to the public
24 in an easily accessible electronic database all data (includ-
25 ing metadata, documentation, models, data processing

1 methods, images, and research results) of the missions
2 and programs of the Earth Science Division of the Admin-
3 istration, or any successor division.

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

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

9 (2) enables outside communities, including the
10 research and applications community, private indus-
11 try, academia, and the general public, to effectively
12 collaborate in areas important to—

13 (A) studying the Earth system and improv-
14 ing the prediction of Earth system change; and

15 (B) improving model development, data as-
16 similation techniques, systems architecture inte-
17 gration, and computational efficiencies; and

18 (3) meets basic end-user requirements for run-
19 ning on public computers and networks located out-
20 side of secure Administration information and tech-
21 nology systems.

22 (c) HOSTING.—The program under subsection (b)
23 shall use, as appropriate and cost-effective, innovative
24 strategies and methods for hosting and management of

1 part or all of the program, including cloud-based com-
2 puting capabilities.

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

8 **SEC. 313. SENSE OF CONGRESS ON SMALL SATELLITE**
9 **SCIENCE.**

10 It is the sense of Congress that—

11 (1) small satellites—

12 (A) are increasingly robust, effective, and
13 affordable platforms for carrying out space
14 science missions;

15 (B) can work in tandem with or augment
16 larger NASA spacecraft to support high-priority
17 science missions of NASA; and

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

22 (2) NASA should continue to support small sat-
23 ellite research, development, technologies, and pro-
24 grams, including technologies for compact and light-
25 weight instrumentation for small satellites.

1 **SEC. 314. SENSE OF CONGRESS ON COMMERCIAL SPACE**
2 **SERVICES.**

3 It is the sense of Congress that—

4 (1) the Administration should explore partner-
5 ships with the commercial space industry for space
6 science missions in and beyond Earth orbit, includ-
7 ing partnerships relating to payload and instrument
8 hosting and commercially available datasets; and

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

12 **SEC. 315. PROCEDURES FOR IDENTIFYING AND ADDRESS-**
13 **ING ALLEGED VIOLATIONS OF SCIENTIFIC IN-**
14 **TEGRITY POLICY.**

15 Not later than 180 days after the date of the enact-
16 ment of this Act, the Administrator shall develop and doc-
17 ument procedures for identifying and addressing alleged
18 violations of the scientific integrity policy of NASA.

19 **TITLE IV—AERONAUTICS**

20 **SEC. 401. SHORT TITLE.**

21 This title may be cited as the “Aeronautics Innova-
22 tion Act”.

23 **SEC. 402. DEFINITIONS.**

24 In this title:

25 (1) **AERONAUTICS STRATEGIC IMPLEMENTA-**
26 **TION PLAN.**—The term “Aeronautics Strategic Im-

1 plementation Plan” means the Aeronautics Strategic
2 Implementation Plan issued by the Aeronautics Re-
3 search Mission Directorate.

4 (2) UNMANNED AIRCRAFT; UNMANNED AIR-
5 CRAFT SYSTEM.—The terms “unmanned aircraft”
6 and “unmanned aircraft system” have the meanings
7 given those terms in section 44801 of title 49,
8 United States Code.

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

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

13 (B) operated by NASA or the Department
14 of Defense.

15 **SEC. 403. EXPERIMENTAL AIRCRAFT PROJECTS.**

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

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

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

23 (A) transitioning new technologies and ma-
24 terials, including associated manufacturing

1 processes, for general aviation, commercial avia-
2 tion, and military aeronautics use; and

3 (B) capturing the full extent of benefits
4 from investments made by the Aeronautics Re-
5 search Mission Directorate in priority programs
6 called for in—

7 (i) the National Aeronautics Research
8 and Development Plan issued by the Na-
9 tional Science and Technology Council in
10 February 2010;

11 (ii) the NASA 2014 Strategic Plan;

12 (iii) the Aeronautics Strategic Imple-
13 mentation Plan; and

14 (iv) any updates to the programs
15 called for in the plans described in clauses

16 (i) through (iii);

17 (3) a level of funding that adequately supports
18 large-scale piloted flight test experimentation and
19 validation, including related infrastructure, should
20 be ensured over a sustained period of time to restore
21 the capacity of NASA—

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

24 (B) to achieve national economic and secu-
25 rity objectives; and

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

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

9 (1) to maintain world leadership in—

10 (A) military and civilian aeronautical
11 science and technology;

12 (B) global air power projection; and

13 (C) aerospace industrialization; and

14 (2) to maintain as a fundamental objective of
15 NASA aeronautics research the steady progression
16 and expansion of flight research and capabilities, in-
17 cluding the science and technology of critical under-
18 lying disciplines and competencies, such as—

19 (A) computational-based analytical and
20 predictive tools and methodologies;

21 (B) aerothermodynamics;

22 (C) propulsion;

23 (D) advanced materials and manufacturing
24 processes;

1 (E) high-temperature structures and mate-
2 rials; and

3 (F) guidance, navigation, and flight con-
4 trols.

5 (c) ESTABLISHMENT AND CONTINUATION OF X-
6 PLANE PROJECTS.—

7 (1) IN GENERAL.—The Administrator shall es-
8 tablish or continue to implement, in a manner that
9 is consistent with the roadmap for supersonic aéro-
10 nautics research and development required by sec-
11 tion 604(b) of the National Aeronautics and Space
12 Administration Transition Authorization Act of
13 2017 (Public Law 115–10; 131 Stat. 55), the fol-
14 lowing projects:

15 (A) A low-boom supersonic aircraft project
16 to demonstrate supersonic aircraft designs and
17 technologies that—

18 (i) reduce sonic boom noise; and

19 (ii) assist the Administrator of the
20 Federal Aviation Administration in ena-
21 bling—

22 (I) the safe commercial deploy-
23 ment of civil supersonic aircraft tech-
24 nology; and

1 (II) the safe and efficient oper-
2 ation of civil supersonic aircraft.

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

10 (C) A series of large-scale X-plane dem-
11 onstrators that are—

12 (i) developed sequentially or in par-
13 allel; and

14 (ii) each based on a set of new con-
15 figuration concepts or technologies deter-
16 mined by the Administrator to dem-
17 onstrate—

18 (I) aircraft and propulsion con-
19 cepts and technologies and related ad-
20 vances in alternative propulsion and
21 energy; and

22 (II) flight propulsion concepts
23 and technologies.

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

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

3 (B) pursue a robust technology maturation
4 and flight test validation effort;

5 (C) improve necessary facilities, flight test-
6 ing capabilities, and computational tools to sup-
7 port the project;

8 (D) award any primary contracts for de-
9 sign, procurement, and manufacturing to
10 United States persons, consistent with inter-
11 national obligations and commitments;

12 (E) coordinate research and flight test
13 demonstration activities with other Federal
14 agencies and the United States aviation com-
15 munity, as the Administrator considers appro-
16 priate; and

17 (F) ensure that the project is aligned with
18 the Aeronautics Strategic Implementation Plan
19 and any updates to the Aeronautics Strategic
20 Implementation Plan.

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

1 (A) a United States citizen or an alien law-
2 fully admitted for permanent residence to the
3 United States; or

4 (B) an entity organized under the laws of
5 the United States or of any jurisdiction within
6 the United States, including a foreign branch of
7 such an entity.

8 (d) ADVANCED MATERIALS AND MANUFACTURING
9 TECHNOLOGY PROGRAM.—

10 (1) IN GENERAL.—The Administrator may es-
11 tablish an advanced materials and manufacturing
12 technology program—

13 (A) to develop—

14 (i) new materials, including composite
15 and high-temperature materials, from base
16 material formulation through full-scale
17 structural validation and manufacture;

18 (ii) advanced materials and manufac-
19 turing processes, including additive manu-
20 facturing, to reduce the cost of manufac-
21 turing scale-up and certification for use in
22 general aviation, commercial aviation, and
23 military aeronautics; and

24 (iii) noninvasive or nondestructive
25 techniques for testing or evaluating avia-

1 tion and aeronautics structures, including
2 for materials and manufacturing processes;

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

6 (C) to provide education and training op-
7 portunities for the aerospace workforce; and

8 (D) to address global cost and human cap-
9 ital competitiveness for United States aero-
10 nautical industries and technological leadership
11 in advanced materials and manufacturing tech-
12 nology.

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

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

17 (B) partner with the private and academic
18 sectors, such as members of the Advanced Com-
19 posites Consortium of NASA, the Joint Ad-
20 vanced Materials and Structures Center of Ex-
21 cellence of the Federal Aviation Administration,
22 the Manufacturing USA institutes of the De-
23 partment of Commerce, and national labora-
24 tories, as the Administrator considers appro-
25 priate;

1 (C) provide a structure for managing intel-
2 lectual property generated by the program
3 based on or consistent with the structure estab-
4 lished for the Advanced Composites Consortium
5 of NASA;

6 (D) ensure adequate Federal cost share for
7 applicable research; and

8 (E) coordinate with advanced manufac-
9 turing and composites initiatives in other mis-
10 sion directorates of NASA, as the Adminis-
11 trator considers appropriate.

12 (e) RESEARCH PARTNERSHIPS.—In carrying out the
13 projects under subsection (c) and a program under sub-
14 section (d), the Administrator may engage in cooperative
15 research programs with—

16 (1) academia; and

17 (2) commercial aviation and aerospace manu-
18 facturers.

19 **SEC. 404. UNMANNED AIRCRAFT SYSTEMS.**

20 (a) UNMANNED AIRCRAFT SYSTEMS OPERATION
21 PROGRAM.—The Administrator shall—

22 (1) research and test capabilities and concepts,
23 including unmanned aircraft systems communica-
24 tions, for integrating unmanned aircraft systems
25 into the national airspace system;

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

5 (3) continue to align the research and testing
6 portfolio of NASA to inform the integration of un-
7 manned aircraft systems into the national airspace
8 system, consistent with public safety and national
9 security objectives.

10 (b) SENSE OF CONGRESS ON COORDINATION WITH
11 FEDERAL AVIATION ADMINISTRATION.—It is the sense of
12 Congress that—

13 (1) NASA should continue—

14 (A) to coordinate with the Federal Avia-
15 tion Administration on research on air traffic
16 management systems for unmanned aircraft
17 systems; and

18 (B) to assist the Federal Aviation Admin-
19 istration in the integration of air traffic man-
20 agement systems for unmanned aircraft sys-
21 tems into the national airspace system; and

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

1 (A) air traffic management systems for un-
2 manned aircraft systems; and

3 (B) the integration of such systems into
4 the national airspace system.

5 **SEC. 405. 21ST CENTURY AERONAUTICS CAPABILITIES INI-**
6 **TIATIVE.**

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

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

18 (1) Any investments the Administrator con-
19 siders necessary to upgrade and create facilities for
20 civil and national security aeronautics research to
21 support advancements in—

22 (A) long-term foundational science and
23 technology;

24 (B) advanced aircraft systems;

25 (C) air traffic management systems;

- 1 (D) fuel efficiency;
- 2 (E) electric propulsion technologies;
- 3 (F) system-wide safety assurance;
- 4 (G) autonomous aviation; and
- 5 (H) supersonic and hypersonic aircraft de-
- 6 sign and development.

7 (2) Any measures the Administrator considers

8 necessary to support flight testing activities, includ-

9 ing—

10 (A) continuous refinement and develop-

11 ment of free-flight test techniques and meth-

12 odologies;

13 (B) upgrades and improvements to real-

14 time tracking and data acquisition; and

15 (C) such other measures relating to aero-

16 nautics research support and modernization as

17 the Administrator considers appropriate to

18 carry out the scientific study of the problems of

19 flight, with a view to practical solutions for

20 such problems.

21 **SEC. 406. SENSE OF CONGRESS ON ON-DEMAND AIR TRANS-**

22 **PORTATION.**

23 It is the sense of Congress that—

24 (1) greater use of high-speed air transportation,

25 small airports, helipads, vertical flight infrastruc-

1 ture, and other aviation-related infrastructure can
2 alleviate surface transportation congestion and sup-
3 port economic growth within cities;

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

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

8 (B) to support the evaluation of advanced
9 technologies and operational concepts that can
10 be leveraged by—

11 (i) industry to develop future vehicles
12 and systems; and

13 (ii) the Federal Aviation Administra-
14 tion to support vehicle safety and oper-
15 ational certification; and

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

19 **SEC. 407. SENSE OF CONGRESS ON HYPERSONIC TECH-**
20 **NOLOGY RESEARCH.**

21 It is the sense of Congress that—

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

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

5 (3) NASA plays a critical role in supporting
6 fundamental hypersonic research focused on system
7 design, analysis and validation, and propulsion tech-
8 nologies;

9 (4) NASA research efforts in hypersonic tech-
10 nology should complement research supported by the
11 Department of Defense to the maximum extent
12 practicable, since contributions from both agencies
13 working in partnership with universities and indus-
14 try are necessary to overcome key technical chal-
15 lenges;

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

19 (6) the commercial sector could provide flight
20 platforms and other capabilities that are able to host
21 and support NASA hypersonic technology research
22 projects; and

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

1 (A) focus research and development efforts
2 on high-speed propulsion systems, reusable ve-
3 hicle technologies, high-temperature materials,
4 and systems analysis;

5 (B) coordinate with the Department of De-
6 fense to prevent duplication of efforts and of in-
7 vestments;

8 (C) include partnerships with universities
9 and industry to accomplish research goals; and

10 (D) maximize public-private use of com-
11 mercially available platforms for hosting re-
12 search and development flight projects.

13 **TITLE V—SPACE TECHNOLOGY**

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

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

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

1 **SEC. 502. FLIGHT OPPORTUNITIES PROGRAM.**

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

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

13 “(c) ESTABLISHMENT.—

14 “(1) IN GENERAL.—The Administrator shall es-
15 tablish a Commercial Reusable Suborbital Research
16 Program within the Space Technology Mission Di-
17 rectorate to fund—

18 “(A) the development of payloads for sci-
19 entific research, technology development, and
20 education;

21 “(B) flight opportunities for those pay-
22 loads to microgravity environments and sub-
23 orbital altitudes; and

24 “(C) transition of those payloads to orbital
25 opportunities.

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

7 “(3) COMMERCIAL SUBORBITAL LAUNCH VEHI-
8 CLES.—In carrying out the Commercial Reusable
9 Suborbital Research Program, the Administrator
10 may not fund the development of new commercial
11 suborbital launch vehicles.

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

18 (c) CONFORMING AMENDMENT.—Section 907(b) of
19 the National Aeronautics and Space Administration Au-
20 thorization Act of 2010 (42 U.S.C. 18405(b)) is amended,
21 in the first sentence, by striking “Commercial Reusable
22 Suborbital Research Program in” and inserting “Commer-
23 cial Reusable Suborbital Research Program established
24 under subsection (c)(1) within”.

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

2 (a) SENSE OF CONGRESS.—It is the sense of Con-
3 gress that the Small Spacecraft Technology Program is
4 important for conducting science and technology valida-
5 tion for—

6 (1) short- and long-duration missions in low-
7 Earth orbit;

8 (2) deep space missions; and

9 (3) deorbiting capabilities designed specifically
10 for smaller spacecraft.

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

17 **SEC. 504. NUCLEAR PROPULSION TECHNOLOGY.**

18 (a) SENSE OF CONGRESS.—It is the sense of Con-
19 gress that nuclear propulsion is critical to the development
20 of advanced spacecraft for civilian and national defense
21 purposes.

22 (b) DEVELOPMENT; STUDIES.—The Administrator
23 shall, in coordination with the Secretary of Energy and
24 the Secretary of Defense—

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

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

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

5 (c) NUCLEAR PROPULSION TECHNOLOGY DEM-
6 ONSTRATION.—

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

9 (A) determine the correct approach for
10 conducting a flight demonstration of nuclear
11 propulsion technology; and

12 (B) submit to Congress a report on a plan
13 for such a demonstration.

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

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

18 (a) SENSE OF CONGRESS.—It is the sense of Con-
19 gress that the Administrator should pursue multiple tech-
20 nical paths for entry, descent, and landing for Mars, in-
21 cluding competitively selected technology demonstration
22 missions.

23 (b) PRIORITIZATION OF LONG-LEAD TECHNOLOGIES
24 AND SYSTEMS.—The Administrator shall prioritize, within
25 the Space Technology Mission Directorate, research, test-

1 ing, and development of long-lead technologies and sys-
2 tems for Mars, including technologies and systems relating
3 to—

4 (1) entry, descent, and landing; and

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

11 (c) **TECHNOLOGY DEMONSTRATION.**—The Adminis-
12 trator may use low-Earth orbit and cis-lunar missions, in-
13 cluding missions to the lunar surface, to demonstrate tech-
14 nologies for Mars.

15 **SEC. 506. PRIORITIZATION OF LOW-ENRICHED URANIUM**
16 **TECHNOLOGY.**

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

19 (1) space technology, including nuclear propul-
20 sion technology and space surface power reactors,
21 should be developed in a manner consistent with
22 broader United States foreign policy, national de-
23 fense, and space exploration and commercialization
24 priorities;

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

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

9 (4) as part of United States efforts to limit
10 international use of highly enriched uranium, the
11 United States has actively pursued—

12 (A) since 1978, the conversion of domestic
13 and foreign research reactors that use highly
14 enriched uranium fuel to low-enriched uranium
15 fuel and the avoidance of any new research re-
16 actors that use highly enriched uranium fuel;
17 and

18 (B) since 1994, the elimination of inter-
19 national commerce in highly enriched uranium
20 for civilian purposes; and

21 (5) the use of low-enriched uranium in place of
22 highly enriched uranium has security, nonprolifera-
23 tion, and economic benefits, including for the na-
24 tional space program.

1 (b) PRIORITIZATION OF LOW-ENRICHED URANIUM
2 TECHNOLOGY.—The Administrator shall—

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

8 (2) prioritize the research, demonstration, and
9 deployment of such designs over designs using highly
10 enriched uranium fuel.

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

16 (1) details the actions taken to implement sub-
17 section (b); and

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

20 (d) DEFINITIONS.—In this section:

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

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

5 **SEC. 507. SENSE OF CONGRESS ON NEXT-GENERATION**
 6 **COMMUNICATIONS TECHNOLOGY.**

7 It is the sense of Congress that—

8 (1) optical communications technologies—

9 (A) will be critical to the development of
 10 next-generation space-based communications
 11 networks;

12 (B) have the potential to allow NASA to
 13 expand the volume of data transmissions in low-
 14 Earth orbit and deep space; and

15 (C) may provide more secure and cost-ef-
 16 fective solutions than current radio frequency
 17 communications systems;

18 (2) quantum encryption technology has prom-
 19 ising implications for the security of the satellite and
 20 terrestrial communications networks of the United
 21 States, including optical communications networks,
 22 and further research and development by NASA
 23 with respect to quantum encryption is essential to
 24 maintaining the security of the United States and
 25 United States leadership in space; and

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

5 (A) to support research on and develop-
6 ment of optical communications; and

7 (B) to develop quantum encryption capa-
8 bilities, especially as those capabilities apply to
9 optical communications networks.

10 **SEC. 508. LUNAR SURFACE TECHNOLOGIES.**

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

13 (1) identify and develop the technologies needed
14 to live on and explore the lunar surface and prepare
15 for future operations on Mars;

16 (2) convene teams of experts from academia, in-
17 dustry, and government to shape the technology de-
18 velopment priorities of the Administration for lunar
19 surface exploration and habitation; and

20 (3) establish partnerships with researchers, uni-
21 versities, and the private sector to rapidly develop
22 and deploy technologies required for successful lunar
23 surface exploration.

24 (b) DEVELOPMENT AND DEMONSTRATION.—The Ad-
25 ministrators shall carry out a program, within the Space

1 Technology Mission Directorate, to conduct technology de-
2 velopment and demonstrations to enable human and
3 robotic exploration on the lunar surface.

4 (c) RESEARCH CONSORTIUM.—The Administrator
5 shall establish a consortium consisting of experts from
6 academia, industry, and government—

7 (1) to assist the Administrator in developing a
8 cohesive, executable strategy for the development
9 and deployment of technologies required for success-
10 ful lunar surface exploration; and

11 (2) to identify specific technologies relating to
12 lunar surface exploration that—

13 (A) should be developed to facilitate such
14 exploration; or

15 (B) require future research and develop-
16 ment.

17 (d) RESEARCH AWARDS.—

18 (1) IN GENERAL.—The Administrator may task
19 any member of the research consortium established
20 under subsection (c) with conducting research and
21 development with respect to a technology identified
22 under paragraph (2) of that subsection.

23 (2) STANDARD PROCESS FOR ARRANGE-
24 MENTS.—

1 (A) IN GENERAL.—The Administrator
2 shall develop a standard process by which a
3 consortium member tasked with research and
4 development under paragraph (1) may enter
5 into a formal arrangement with the Adminis-
6 trator to carry out such research and develop-
7 ment, such as an arrangement under section
8 702 or 703.

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

15 **TITLE VI—STEM ENGAGEMENT**

16 **SEC. 601. SENSE OF CONGRESS.**

17 It is the sense of Congress that—

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

20 (2) NASA is uniquely positioned to help in-
21 crease student interest in science, technology, engi-
22 neering, and math;

23 (3) engaging students, and providing hands-on
24 experience at an early age, in science, technology,
25 engineering, and math are important aspects of en-

1 suring and promoting United States leadership in
2 innovation; and

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

5 (A) to increase kindergarten through grade
6 12 involvement in NASA projects;

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

9 (C) to support individuals who are under-
10 represented in science, technology, engineering,
11 and math fields, such as women, minorities,
12 and individuals in rural areas; and

13 (D) to provide flight opportunities for stu-
14 dent experiments and investigations.

15 **SEC. 602. STEM EDUCATION ENGAGEMENT ACTIVITIES.**

16 (a) IN GENERAL.—The Administrator shall continue
17 to provide opportunities for formal and informal STEM
18 education engagement activities within the Office of
19 NASA STEM Engagement and other NASA directorates,
20 including—

21 (1) the Established Program to Stimulate Com-
22 petitive Research;

23 (2) the Minority University Research and Edu-
24 cation Project; and

1 (3) the National Space Grant College and Fel-
2 lowship Program.

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

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

16 (1) the status of the programs described in sub-
17 section (a); and

18 (2) the manner by which each NASA STEM
19 education engagement activity is organized and
20 funded.

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

1 **SEC. 603. SKILLED TECHNICAL EDUCATION OUTREACH**
2 **PROGRAM.**

3 (a) **ESTABLISHMENT.**—The Administrator shall es-
4 tablish a program to conduct outreach to secondary school
5 students—

6 (1) to expose students to careers that require
7 career and technical education; and

8 (2) to encourage students to pursue careers
9 that require career and technical education.

10 (b) **OUTREACH PLAN.**—Not later than 180 days after
11 the date of the enactment of this Act, the Administrator
12 shall submit to the appropriate committees of Congress
13 a report on the outreach program under subsection (a)
14 that includes—

15 (1) an implementation plan;

16 (2) a description of the resources needed to
17 carry out the program; and

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

21 (c) **SYSTEMS OBSERVATION.**—

22 (1) **IN GENERAL.**—The Administrator shall de-
23 velop a program and associated policies to allow stu-
24 dents from accredited educational institutions to
25 view the manufacturing, assembly, and testing of

1 NASA-funded space and aeronautical systems, as
2 the Administrator considers appropriate.

3 (2) CONSIDERATIONS.—In developing the pro-
4 gram and policies under paragraph (1), the Adminis-
5 trator shall take into consideration factors such as
6 workplace safety, mission needs, and the protection
7 of sensitive and proprietary technologies.

8 **SEC. 604. NATIONAL SPACE GRANT COLLEGE AND FELLOW-**
9 **SHIP PROGRAM.**

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

12 (1) in paragraph (3)—

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

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

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

18 “(D) promote equally the State and re-
19 gional STEM interests of each space grant con-
20 sortium;”; and

21 (2) in paragraph (4), by striking “made up of
22 university and industry members, in order to ad-
23 vance” and inserting “comprised of members of uni-
24 versities in each State and other entities, such as 2-

1 year colleges, industries, science learning centers,
2 museums, and government entities, to advance”.

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

5 (1) by striking paragraph (3);

6 (2) by inserting after paragraph (2) the fol-
7 lowing:

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

10 “(A) was designated by the Administrator
11 under section 40306, as in effect on the day be-
12 fore the date of the enactment of the National
13 Aeronautics and Space Administration Author-
14 ization Act of 2020; or

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

17 (3) in paragraph (4), by striking “space grant
18 college, space grant regional consortium, institution
19 of higher education,” and inserting “lead institution,
20 space grant consortium,”;

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

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

24 “(6) SPACE GRANT CONSORTIUM.—The term
25 ‘space grant consortium’ means a State-wide group,

1 led by a lead institution, that has established part-
2 nerships with other academic institutions, industries,
3 science learning centers, museums, and government
4 entities to promote a strong educational base in the
5 space and aeronautical sciences.”;

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

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

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

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

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

14 (c) PROGRAM OBJECTIVE.—Section 40303 of title
15 51, United States Code, is amended—

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

17 (2) by redesignating subsection (c) as sub-
18 section (e); and

19 (3) by striking subsection (b) and inserting the
20 following:

21 “(b) PROGRAM OBJECTIVE.—

22 “(1) IN GENERAL.—The Administrator shall
23 carry out the national space grant college and fel-
24 lowship program with the objective of providing
25 hands-on research, training, and education programs

1 with measurable outcomes in each State, including
2 programs to provide—

3 “(A) internships, fellowships, and scholar-
4 ships;

5 “(B) interdisciplinary hands-on mission
6 programs and design projects;

7 “(C) student internships with industry or
8 university researchers or at centers of the Ad-
9 ministration;

10 “(D) faculty and curriculum development
11 initiatives;

12 “(E) university-based research initiatives
13 relating to the Administration and the STEM
14 workforce needs of each State; or

15 “(F) STEM engagement programs for kin-
16 dergarten through grade 12 teachers and stu-
17 dents.

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

1 “(A) The space and aeronautics research
2 needs of the Administration, including the mis-
3 sion directorates.

4 “(B) The need to develop a national
5 STEM workforce.

6 “(C) The STEM workforce needs of the
7 State.

8 “(c) PROGRAM ADMINISTERED THROUGH SPACE
9 GRANT CONSORTIA.—The Administrator shall carry out
10 the national space grant college and fellowship program
11 through the space grant consortia.

12 “(d) SUSPENSION; TERMINATION; NEW COMPETI-
13 TION.—

14 “(1) SUSPENSION.—The Administrator may,
15 for cause and after an opportunity for hearing, sus-
16 pend a lead institution that was designated by the
17 Administrator under section 40306, as in effect on
18 the day before the date of the enactment of the Na-
19 tional Aeronautics and Space Administration Au-
20 thorization Act of 2020.

21 “(2) TERMINATION.—If the issue resulting in a
22 suspension under paragraph (1) is not resolved with-
23 in a period determined by the Administrator, the
24 Administrator may terminate the designation of the
25 entity as a lead institution.

1 “(3) NEW COMPETITION.—If the Administrator
2 terminates the designation of an entity as a lead in-
3 stitution, the Administrator may initiate a new com-
4 petition in the applicable State for the designation of
5 a lead institution.”.

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

8 **“§ 40304. Grants**

9 “(a) ELIGIBLE SPACE GRANT CONSORTIUM DE-
10 FINED.—In this section, the term ‘eligible space grant
11 consortium’ means a space grant consortium that the Ad-
12 ministrators has determined—

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

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

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

20 “(b) GRANTS.—

21 “(1) IN GENERAL.—The Administrator shall
22 award grants to the lead institutions of eligible space
23 grant consortia to carry out the programs under sec-
24 tion 40303(b)(1).

25 “(2) REQUEST FOR PROPOSALS.—

1 “(A) IN GENERAL.—On the expiration of
2 existing cooperative agreements between the
3 Administration and the space grant consortia,
4 the Administrator shall issue a request for pro-
5 posals from space grant consortia for the award
6 of grants under this section.

7 “(B) APPLICATIONS.—A lead institution of
8 a space grant consortium that seeks a grant
9 under this section shall submit, on behalf of
10 such space grant consortium, an application to
11 the Administrator at such time, in such man-
12 ner, and accompanied by such information as
13 the Administrator may require.

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

18 “(A) each State;

19 “(B) the District of Columbia; and

20 “(C) the Commonwealth of Puerto Rico.

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

25 “(c) ALLOCATION OF FUNDING.—

1 “(1) PROGRAM IMPLEMENTATION.—

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

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

10 “(ii) The territories of Guam and the
11 United States Virgin Islands shall each re-
12 ceive funds equal to approximately $\frac{1}{5}$ of
13 the share for each eligible space grant con-
14 sortia.

15 “(B) MATCHING REQUIREMENT.—Each el-
16 igible space grant consortium shall match the
17 funds allocated under subparagraph (A)(i) on a
18 basis of not less than 1 non-Federal dollar for
19 every 1 Federal dollar, except that any program
20 funded under paragraph (3) or any program to
21 carry out 1 or more internships or fellowships
22 shall not be subject to that matching require-
23 ment.

24 “(2) PROGRAM ADMINISTRATION.—

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

6 “(B) COSTS COVERED.—The funds allo-
7 cated under subparagraph (A) shall cover all
8 costs of the Administration associated with the
9 administration of the national space grant col-
10 lege and fellowship program, including—

11 “(i) direct costs of the program, in-
12 cluding costs relating to support services
13 and civil service salaries and benefits;

14 “(ii) indirect general and administra-
15 tive costs of centers and facilities of the
16 Administration; and

17 “(iii) indirect general and administra-
18 tive costs of the Administration head-
19 quarters.

20 “(3) SPECIAL PROGRAMS.—Of the funds made
21 available each fiscal year for the national space
22 grant college and fellowship program, the Adminis-
23 trator shall allocate not more than 5 percent to the
24 lead institutions of space grant consortia established
25 as of the date of the enactment of the National Aer-

1 onautics and Space Administration Authorization
2 Act of 2020 for grants to carry out innovative ap-
3 proaches and programs to further science and edu-
4 cation relating to the missions of the Administration
5 and STEM disciplines.

6 “(d) TERMS AND CONDITIONS.—

7 “(1) LIMITATIONS.—Amounts made available
8 through a grant under this section may not be ap-
9 plied to—

10 “(A) the purchase of land;

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

13 “(C) the purchase or construction of a
14 launch facility or launch vehicle.

15 “(2) LEASES.—Notwithstanding paragraph (1),
16 land, buildings, launch facilities, and launch vehicles
17 may be leased under a grant on written approval by
18 the Administrator.

19 “(3) RECORDS.—

20 “(A) IN GENERAL.—Any person that re-
21 ceives or uses the proceeds of a grant under
22 this section shall keep such records as the Ad-
23 ministrator shall by regulation prescribe as
24 being necessary and appropriate to facilitate ef-
25 fective audit and evaluation, including records

1 that fully disclose the amount and disposition
2 by a recipient of such proceeds, the total cost
3 of the program or project in connection with
4 which such proceeds were used, and the
5 amount, if any, of such cost that was provided
6 through other sources.

7 “(B) MAINTENANCE OF RECORDS.—
8 Records under subparagraph (A) shall be main-
9 tained for not less than 3 years after the date
10 of completion of such a program or project.

11 “(C) ACCESS.—For the purpose of audit
12 and evaluation, the Administrator and the
13 Comptroller General of the United States shall
14 have access to any books, documents, papers,
15 and records of receipts relating to a grant
16 under this section, as determined by the Admin-
17 istrator or Comptroller General.”.

18 (e) PROGRAM STREAMLINING.—Title 51, United
19 States Code, is amended—

20 (1) by striking sections 40305 through 40308,
21 40310, and 40311; and

22 (2) by redesignating section 40309 as section
23 40305.

24 (f) CONFORMING AMENDMENT.—The table of sec-
25 tions at the beginning of chapter 403 of title 51, United

1 States Code, is amended by striking the items relating to
 2 sections 40304 through 40311 and inserting the following:

“40304. Grants.

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

3 **TITLE VII—WORKFORCE AND**
 4 **INDUSTRIAL BASE**

5 **SEC. 701. APPOINTMENT AND COMPENSATION PILOT PRO-**
 6 **GRAM.**

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

10 (1) section 2301 of that title;

11 (2) section 2302 of that title;

12 (3) chapter 71 of that title;

13 (4) section 7204 of that title; and

14 (5) chapter 73 of that title.

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

20 (1) appoint and manage such designated per-
 21 sonnel of the Administration, without regard to the
 22 covered provisions; and

23 (2) fix the compensation of such designated
 24 personnel of the Administration, without regard to

1 chapter 51 and subchapter III of chapter 53 of title
2 5, United States Code, at a rate that does not ex-
3 ceed the per annum rate of salary of the Vice Presi-
4 dent of the United States under section 104 of title
5 3, United States Code.

6 (c) ADMINISTRATOR RESPONSIBILITIES.—In car-
7 rying out the pilot program established under subsection
8 (b), the Administrator shall ensure that the pilot pro-
9 gram—

10 (1) uses—

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

12 (B) simplified classification methods with
13 respect to personnel of the Administration; and

14 (C) broad banding; and

15 (2) offers—

16 (A) competitive compensation; and

17 (B) the opportunity for career mobility.

18 **SEC. 702. ESTABLISHMENT OF MULTI-INSTITUTION CON-**

19 **SORTIA.**

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

23 (1) establish one or more multi-institution con-
24 sortia to facilitate access to essential engineering, re-

1 search, and development capabilities in support of
2 NASA missions;

3 (2) use such a consortium to fund technical
4 analyses and other engineering support to address
5 the acquisition, technical, and operational needs of
6 NASA centers; and

7 (3) ensure such a consortium—

8 (A) is held accountable for the technical
9 quality of the work product developed under
10 this section; and

11 (B) convenes disparate groups to facilitate
12 public-private partnerships.

13 (b) POLICIES AND PROCEDURES.—The Adminis-
14 trator shall develop and implement policies and procedures
15 to govern, with respect to the establishment of a consor-
16 tium under subsection (a)—

17 (1) the selection of participants;

18 (2) the award of cooperative agreements or
19 other contracts;

20 (3) the appropriate use of competitive awards
21 and sole source awards; and

22 (4) technical capabilities required.

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

1 (1) An institution of higher education (as de-
2 fined in section 102 of the Higher Education Act of
3 1965 (20 U.S.C. 1002)).

4 (2) An operator of a federally funded research
5 and development center.

6 (3) A nonprofit or not-for-profit research insti-
7 tution.

8 (4) A consortium composed of—

9 (A) an entity described in paragraph (1),
10 (2), or (3); and

11 (B) one or more for-profit entities.

12 **SEC. 703. EXPEDITED ACCESS TO TECHNICAL TALENT AND**
13 **EXPERTISE.**

14 (a) IN GENERAL.—The Administrator may—

15 (1) establish one or more multi-institution task
16 order contracts, consortia, cooperative agreements,
17 or other arrangements to facilitate expedited access
18 to eligible entities in support of NASA missions; and

19 (2) use such a multi-institution task order con-
20 tract, consortium, cooperative agreement, or other
21 arrangement to fund technical analyses and other
22 engineering support to address the acquisition, tech-
23 nical, and operational needs of NASA centers.

24 (b) CONSULTATION WITH OTHER NASA-AFFILIATED
25 ENTITIES.—To ensure access to technical expertise and

1 reduce costs and duplicative efforts, a multi-institution
2 task order contract, consortium, cooperative agreement, or
3 any other arrangement established under subsection (a)(1)
4 shall, to the maximum extent practicable, be carried out
5 in consultation with other NASA-affiliated entities, includ-
6 ing federally funded research and development centers,
7 university-affiliated research centers, and NASA labora-
8 tories and test centers.

9 (c) POLICIES AND PROCEDURES.—The Adminis-
10 trator shall develop and implement policies and procedures
11 to govern, with respect to the establishment of a multi-
12 institution task order contract, consortium, cooperative
13 agreement, or any other arrangement under subsection
14 (a)(1)—

- 15 (1) the selection of participants;
- 16 (2) the award of task orders;
- 17 (3) the maximum award size for a task;
- 18 (4) the appropriate use of competitive awards
19 and sole source awards; and
- 20 (5) technical capabilities required.

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

- 23 (1) an institution of higher education (as de-
24 fined in section 102 of the Higher Education Act of
25 1965 (20 U.S.C. 1002));

1 (2) an operator of a federally funded research
2 and development center;

3 (3) a nonprofit or not-for-profit research insti-
4 tution; and

5 (4) a consortium composed of—

6 (A) an entity described in paragraph (1),
7 (2), or (3); and

8 (B) one or more for-profit entities.

9 **SEC. 704. REPORT ON INDUSTRIAL BASE FOR CIVIL SPACE**
10 **MISSIONS AND OPERATIONS.**

11 (a) **IN GENERAL.**—Not later than 1 year after the
12 date of the enactment of this Act, and from time to time
13 thereafter, the Administrator shall submit to the appro-
14 priate committees of Congress a report on the United
15 States industrial base for NASA civil space missions and
16 operations.

17 (b) **ELEMENTS.**—The report required by subsection
18 (a) shall include the following:

19 (1) A comprehensive description of the current
20 status of the United States industrial base for
21 NASA civil space missions and operations.

22 (2) A description and assessment of the weak-
23 nesses in the supply chain, skills, manufacturing ca-
24 pacity, raw materials, key components, and other
25 areas of the United States industrial base for NASA

1 civil space missions and operations that could ad-
2 versely impact such missions and operations if un-
3 available.

4 (3) A description and assessment of various
5 mechanisms to address and mitigate the weaknesses
6 described pursuant to paragraph (2).

7 (4) A comprehensive list of the collaborative ef-
8 forts, including future and proposed collaborative ef-
9 forts, between NASA and the Manufacturing USA
10 institutes of the Department of Commerce.

11 (5) An assessment of—

12 (A) the defense and aerospace manufac-
13 turing supply chains relevant to NASA in each
14 region of the United States; and

15 (B) the feasibility and benefits of estab-
16 lishing a supply chain center of excellence in a
17 State in which NASA does not, as of the date
18 of the enactment of this Act, have a research
19 center or test facility.

20 (6) Such other matters relating to the United
21 States industrial base for NASA civil space missions
22 and operations as the Administrator considers ap-
23 propriate.

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

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

4 “(o) PROVISIONS RELATED TO SEPARATION AND RE-
5 TIREMENT INCENTIVES.—

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

8 “(A) means an employee of the Adminis-
9 tration serving under an appointment without
10 time limitation; and

11 “(B) does not include—

12 “(i) a reemployed annuitant under
13 subchapter III of chapter 83 or chapter 84
14 of title 5 or any other retirement system
15 for employees of the Federal Government;

16 “(ii) an employee having a disability
17 on the basis of which such employee is or
18 would be eligible for disability retirement
19 under any of the retirement systems re-
20 ferred to in clause (i); or

21 “(iii) for purposes of eligibility for
22 separation incentives under this subsection,
23 an employee who is in receipt of a decision
24 notice of involuntary separation for mis-
25 conduct or unacceptable performance.

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

12 “(3) EARLY RETIREMENT.—An employee who
13 is at least 50 years of age and has completed 20
14 years of service, or has at least 25 years of service,
15 may, pursuant to regulations promulgated under
16 this subsection, apply and be retired from the Ad-
17 ministration and receive benefits in accordance with
18 subchapter III of chapter 83 or 84 of title 5 if the
19 employee has been employed continuously within the
20 Administration for more than 30 days before the
21 date on which the determination to conduct a reduc-
22 tion or restructuring within 1 or more Administra-
23 tion centers is approved.

24 “(4) SEPARATION PAY.—

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

4 “(i) an amount equal to the amount
5 the employee would be entitled to receive
6 under section 5595(c) of title 5, if the em-
7 ployee were entitled to payment under such
8 section; or

9 “(ii) \$40,000.

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

19 “(C) INSTALLMENTS.—Separation pay, if
20 paid in installments, shall cease to be paid upon
21 the recipient’s acceptance of employment by the
22 Federal Government, or commencement of work
23 under a personal services contract as described
24 in paragraph (5).

25 “(5) LIMITATIONS ON REEMPLOYMENT.—

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

7 “(B) An employee who receives separation
8 pay under this section on the basis of a separa-
9 tion and accepts employment with the Govern-
10 ment of the United States, or who commences
11 work through a personal services contract with
12 the United States within 5 years after the date
13 of the separation on which payment of the sepa-
14 ration pay is based, shall be required to repay
15 the entire amount of the separation pay to the
16 Administration. If the employment is with an
17 Executive agency (as defined by section 105 of
18 title 5) other than the Administration, the Ad-
19 ministrator may, at the request of the head of
20 that agency, waive the repayment if the indi-
21 vidual involved possesses unique abilities and is
22 the only qualified applicant available for the po-
23 sition. If the employment is within the Adminis-
24 tration, the Administrator may waive the repay-
25 ment if the individual involved is the only quali-

1 fied applicant available for the position. If the
2 employment is with an entity in the legislative
3 branch, the head of the entity or the appointing
4 official may waive the repayment if the indi-
5 vidual involved possesses unique abilities and is
6 the only qualified applicant available for the po-
7 sition. If the employment is with the judicial
8 branch, the Director of the Administrative Of-
9 fice of the United States Courts may waive the
10 repayment if the individual involved possesses
11 unique abilities and is the only qualified appli-
12 cant available for the position.

13 “(6) REGULATIONS.—Under the program es-
14 tablished under paragraph (2), early retirement and
15 separation pay may be offered only pursuant to reg-
16 ulations established by the Administrator, subject to
17 such limitations or conditions as the Administrator
18 may require.

19 “(7) USE OF EXISTING FUNDS.—The Adminis-
20 trator shall carry out this subsection using amounts
21 otherwise made available to the Administrator and
22 no additional funds are authorized to be appro-
23 priated to carry out this subsection.”.

1 **SEC. 706. CONFIDENTIALITY OF MEDICAL QUALITY ASSUR-**
2 **ANCE RECORDS.**

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

6 **“§ 31303. Confidentiality of medical quality assurance**
7 **records**

8 “(a) IN GENERAL.—Except as provided in subsection
9 (b)(1)—

10 “(1) a medical quality assurance record, or any
11 part of a medical quality assurance record, may not
12 be subject to discovery or admitted into evidence in
13 a judicial or administrative proceeding; and

14 “(2) an individual who reviews or creates a
15 medical quality assurance record for the Administra-
16 tion, or participates in any proceeding that reviews
17 or creates a medical quality assurance record, may
18 not testify in a judicial or administrative proceeding
19 with respect to—

20 “(A) the medical quality assurance record;
21 or

22 “(B) any finding, recommendation, evalua-
23 tion, opinion, or action taken by such individual
24 or in accordance with such proceeding with re-
25 spect to the medical quality assurance record.

26 “(b) DISCLOSURE OF RECORDS.—

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

4 “(A) a Federal agency or private entity, if
5 the medical quality assurance record is nec-
6 essary for the Federal agency or private entity
7 to carry out—

8 “(i) licensing or accreditation func-
9 tions relating to Administration healthcare
10 facilities; or

11 “(ii) monitoring of Administration
12 healthcare facilities required by law;

13 “(B) a Federal agency or healthcare pro-
14 vider, if the medical quality assurance record is
15 required by the Federal agency or healthcare
16 provider to enable Administration participation
17 in a healthcare program of the Federal agency
18 or healthcare provider;

19 “(C) a criminal or civil law enforcement
20 agency, or an instrumentality authorized by law
21 to protect the public health or safety, on writ-
22 ten request by a qualified representative of such
23 agency or instrumentality submitted to the Ad-
24 ministrator that includes a description of the

1 lawful purpose for which the medical quality as-
2 surance record is requested;

3 “(D) an officer, an employee, or a con-
4 tractor of the Administration who requires the
5 medical quality assurance record to carry out
6 an official duty associated with healthcare;

7 “(E) healthcare personnel, to the extent
8 necessary to address a medical emergency af-
9 fecting the health or safety of an individual;
10 and

11 “(F) any committee, panel, or board con-
12 vened by the Administration to review the
13 healthcare-related policies and practices of the
14 Administration.

15 “(2) SUBSEQUENT DISCLOSURE PROHIBITED.—
16 An individual or entity to whom a medical quality
17 assurance record has been disclosed under para-
18 graph (1) may not make a subsequent disclosure of
19 the medical quality assurance record.

20 “(c) PERSONALLY IDENTIFIABLE INFORMATION.—

21 “(1) IN GENERAL.—Except as provided in para-
22 graph (2), the personally identifiable information
23 contained in a medical quality assurance record of a
24 patient or an employee of the Administration, or any
25 other individual associated with the Administration

1 for purposes of a medical quality assurance pro-
2 gram, shall be removed before the disclosure of the
3 medical quality assurance record to an entity other
4 than the Administration.

5 “(2) EXCEPTION.— Personally identifiable in-
6 formation described in paragraph (1) may be re-
7 leased to an entity other than the Administration if
8 the Administrator makes a determination that the
9 release of such personally identifiable information—

10 “(A) is in the best interests of the Admin-
11 istration; and

12 “(B) does not constitute an unwarranted
13 invasion of personal privacy.

14 “(d) EXCLUSION FROM FOIA.—A medical quality
15 assurance record may not be made available to any person
16 under section 552 of title 5, United States Code (com-
17 monly referred to as the ‘Freedom of Information Act’),
18 and this section shall be considered a statute described
19 in subsection (b)(3)(B) of such section 522.

20 “(e) REGULATIONS.—Not later than one year after
21 the date of the enactment of this section, the Adminis-
22 trator shall promulgate regulations to implement this sec-
23 tion.

24 “(f) RULES OF CONSTRUCTION.—Nothing in this
25 section shall be construed—

1 “(1) to withhold a medical quality assurance
2 record from a committee of the Senate or House of
3 Representatives or a joint committee of Congress if
4 the medical quality assurance record relates to a
5 matter within the jurisdiction of such committee or
6 joint committee; or

7 “(2) to limit the use of a medical quality assur-
8 ance record within the Administration, including the
9 use by a contractor or consultant of the Administra-
10 tion.

11 “(g) DEFINITIONS.—In this section:

12 “(1) MEDICAL QUALITY ASSURANCE RECORD.—
13 The term ‘medical quality assurance record’ means
14 any proceeding, discussion, record, finding, rec-
15 ommendation, evaluation, opinion, minutes, report,
16 or other document or action that results from a
17 quality assurance committee, quality assurance pro-
18 gram, or quality assurance program activity.

19 “(2) QUALITY ASSURANCE PROGRAM.—

20 “(A) IN GENERAL.—The term ‘quality as-
21 surance program’ means a comprehensive pro-
22 gram of the Administration—

23 “(i) to systematically review and im-
24 prove the quality of medical and behavioral
25 health services provided by the Administra-

1 tion to ensure the safety and security of
 2 individuals receiving such health services;
 3 and

4 “(ii) to evaluate and improve the effi-
 5 ciency, effectiveness, and use of staff and
 6 resources in the delivery of such health
 7 services.

8 “(B) INCLUSION.—The term ‘quality as-
 9 surance program’ includes any activity carried
 10 out by or for the Administration to assess the
 11 quality of medical care provided by the Admin-
 12 istration.”.

13 (b) TECHNICAL AND CONFORMING AMENDMENT.—
 14 The table of sections for chapter 313 of title 51, United
 15 States Code, is amended by adding at the end the fol-
 16 lowing:

 “31303. Confidentiality of medical quality assurance records.”.

17 **TITLE VIII—MISCELLANEOUS**
 18 **PROVISIONS**

19 **SEC. 801. CONTRACTING AUTHORITY.**

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

22 “(o) CONTRACTING AUTHORITY.—The Administra-
 23 tion—

24 “(1) may enter into an agreement with a pri-
 25 vate, commercial, or State government entity to pro-

1 vide the entity with supplies, support, and services
2 related to private, commercial, or State government
3 space activities carried out at a property owned or
4 operated by the Administration; and

5 “(2) upon the request of such an entity, may
6 include such supplies, support, and services in the
7 requirements of the Administration if—

8 “(A) the Administrator determines that
9 the inclusion of such supplies, support, or serv-
10 ices in such requirements—

11 “(i) is in the best interest of the Fed-
12 eral Government;

13 “(ii) does not interfere with the re-
14 quirements of the Administration; and

15 “(iii) does not compete with the com-
16 mercial space activities of other such enti-
17 ties; and

18 “(B) the Administration has full reimburs-
19 able funding from the entity that requested
20 supplies, support, and services prior to making
21 any obligation for the delivery of such supplies,
22 support, or services under an Administration
23 procurement contract or any other agreement.”.

1 **SEC. 802. AUTHORITY FOR TRANSACTION PROTOTYPE**
2 **PROJECTS AND FOLLOW-ON PRODUCTION**
3 **CONTRACTS.**

4 Section 20113 of title 51, United States Code, as
5 amended by section 801, is further amended by adding
6 at the end the following:

7 “(p) TRANSACTION PROTOTYPE PROJECTS AND FOL-
8 LOW-ON PRODUCTION CONTRACTS.—

9 “(1) IN GENERAL.—The Administration may
10 enter into a transaction (other than a contract, co-
11 operative agreement, or grant) to carry out a proto-
12 type project that is directly relevant to enhancing
13 the mission effectiveness of the Administration.

14 “(2) SUBSEQUENT AWARD OF FOLLOW-ON PRO-
15 Duction CONTRACT.—A transaction entered into
16 under this subsection for a prototype project may
17 provide for the subsequent award of a follow-on pro-
18 duction contract to participants in the transaction.

19 “(3) INCLUSION.—A transaction under this
20 subsection includes a project awarded to an indi-
21 vidual participant and to all individual projects
22 awarded to a consortium of United States industry
23 and academic institutions.

24 “(4) DETERMINATION.—The authority of this
25 section may be exercised for a transaction for a pro-
26 totype project and any follow-on production contract,

1 upon a determination by the head of the contracting
2 activity, in accordance with Administration policies,
3 that—

4 “(A) circumstances justify use of a trans-
5 action to provide an innovative business ar-
6 rangement that would not be feasible or appro-
7 priate under a contract; and

8 “(B) the use of the authority of this sec-
9 tion is essential to promoting the success of the
10 prototype project.

11 “(5) COMPETITIVE PROCEDURE.—

12 “(A) IN GENERAL.—To the maximum ex-
13 tent practicable, the Administrator shall use
14 competitive procedures with respect to entering
15 into a transaction to carry out a prototype
16 project.

17 “(B) EXCEPTION.—Notwithstanding sec-
18 tion 2304 of title 10, United States Code, a fol-
19 low-on production contract may be awarded to
20 the participants in the prototype transaction
21 without the use of competitive procedures, if—

22 “(i) competitive procedures were used
23 for the selection of parties for participation
24 in the prototype transaction; and

1 “(ii) the participants in the trans-
2 action successfully completed the prototype
3 project provided for in the transaction.

4 “(6) COST SHARE.—A transaction to carry out
5 a prototype project and a follow-on production con-
6 tract may require that part of the total cost of the
7 transaction or contract be paid by the participant or
8 contractor from a source other than the Federal
9 Government.

10 “(7) PROCUREMENT ETHICS.—A transaction
11 under this authority shall be considered an agency
12 procurement for purposes of chapter 21 of title 41,
13 United States Code, with regard to procurement eth-
14 ics.”.

15 **SEC. 803. PROTECTION OF DATA AND INFORMATION FROM**
16 **PUBLIC DISCLOSURE.**

17 (a) CERTAIN TECHNICAL DATA.—Section 20131 of
18 title 51, United States Code, is amended—

19 (1) by redesignating subsection (c) as sub-
20 section (d);

21 (2) in subsection (a)(3), by striking “subsection
22 (b)” and inserting “subsection (b) or (c)”;

23 (3) by inserting after subsection (b) the fol-
24 lowing:

1 “(c) SPECIAL HANDLING OF CERTAIN TECHNICAL
2 DATA.—

3 “(1) IN GENERAL.—The Administrator may
4 provide appropriate protections against the public
5 dissemination of certain technical data, including ex-
6 emption from subchapter II of chapter 5 of title 5.

7 “(2) DEFINITIONS.—In this subsection:

8 “(A) CERTAIN TECHNICAL DATA.—The
9 term ‘certain technical data’ means technical
10 data that may not be exported lawfully outside
11 the United States without approval, authoriza-
12 tion, or license under—

13 “(i) the Export Control Reform Act of
14 2018 (Public Law 115–232; 132 Stat.
15 2208); or

16 “(ii) the International Security Assist-
17 ance and Arms Export Control Act of
18 1976 (Public Law 94–329; 90 Stat. 729).

19 “(B) TECHNICAL DATA.—The term ‘tech-
20 nical data’ means any blueprint, drawing, pho-
21 tograph, plan, instruction, computer software,
22 or documentation, or any other technical infor-
23 mation.”;

1 (4) in subsection (d), as so redesignated, by in-
2 serting “, including any data,” after “information”;
3 and

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

5 “(e) EXCLUSION FROM FOIA.—This section shall be
6 considered a statute described in subsection (b)(3)(B) of
7 section 552 of title 5 (commonly referred to as the ‘Free-
8 dom of Information Act’).”.

9 (b) CERTAIN VOLUNTARILY PROVIDED SAFETY-RE-
10 LATED INFORMATION.—

11 (1) IN GENERAL.—The Administrator shall pro-
12 vide appropriate safeguards against the public dis-
13 semination of safety-related information collected as
14 part of a mishap investigation carried out under the
15 NASA safety reporting system or in conjunction
16 with an organizational safety assessment, if the Ad-
17 ministrator makes a written determination, including
18 a justification of the determination, that—

19 (A)(i) disclosure of the information would
20 inhibit individuals from voluntarily providing
21 safety-related information; and

22 (ii) the ability of NASA to collect such in-
23 formation improves the safety of NASA pro-
24 grams and research relating to aeronautics and
25 space; or

1 (B) withholding such information from public
2 disclosure improves the safety of such NASA pro-
3 grams and research.

4 (2) OTHER FEDERAL AGENCIES.—Notwith-
5 standing any other provision of law, if the Adminis-
6 trator provides to the head of another Federal agen-
7 cy safety-related information with respect to which
8 the Administrator has made a determination under
9 paragraph (1), the head of the Federal agency shall
10 withhold the information from public disclosure.

11 (3) PUBLIC AVAILABILITY.—A determination or
12 part of a determination under paragraph (1) shall be
13 made available to the public on request, as required
14 under section 552 of title 5, United States Code
15 (commonly referred to as the “Freedom of Informa-
16 tion Act”).

17 (4) EXCLUSION FROM FOIA.—This subsection
18 shall be considered a statute described in subsection
19 (b)(3)(B) of section 552 of title 5, United States
20 Code.

21 **SEC. 804. PHYSICAL SECURITY MODERNIZATION.**

22 Chapter 201 of title 51, United States Code, is
23 amended—

24 (1) in section 20133(2), by striking “property”
25 and all that follows through “to the United States,”

1 and inserting “Administration personnel or of prop-
2 erty owned or leased by, or under the control of, the
3 United States”; and

4 (2) in section 20134, in the second sentence—

5 (A) by inserting “Administration personnel
6 or any” after “protecting”; and

7 (B) by striking “, at facilities owned or
8 contracted to the Administration”.

9 **SEC. 805. LEASE OF NON-EXCESS PROPERTY.**

10 Section 20145 of title 51, United States Code, is
11 amended—

12 (1) in paragraph (b)(1)(B), by striking “en-
13 tered into for the purpose of developing renewable
14 energy production facilities”; and

15 (2) in subsection (g), in the first sentence, by
16 striking “December 31, 2021” and inserting “De-
17 cember 31, 2025”.

18 **SEC. 806. CYBERSECURITY.**

19 (a) IN GENERAL.—Section 20301 of title 51, United
20 States Code, is amended by adding at the end the fol-
21 lowing:

22 “(c) CYBERSECURITY.—The Administrator shall up-
23 date and improve the cybersecurity of NASA space assets
24 and supporting infrastructure.”.

25 (b) SECURITY OPERATIONS CENTER.—

1 (1) ESTABLISHMENT.—The Administrator shall
2 maintain a Security Operations Center, to identify
3 and respond to cybersecurity threats to NASA infor-
4 mation technology systems, including institutional
5 systems and mission systems.

6 (2) INSPECTOR GENERAL RECOMMENDA-
7 TIONS.—The Administrator shall implement, to the
8 maximum extent practicable, each of the rec-
9 ommendations contained in the report of the Inspec-
10 tor General of NASA entitled “Audit of NASA’s Se-
11 curity Operations Center”, issued on May 23, 2018.

12 (c) CYBER THREAT HUNT.—

13 (1) IN GENERAL.—The Administrator, in co-
14 ordination with the Secretary of Homeland Security
15 and the heads of other relevant Federal agencies,
16 may implement a cyber threat hunt capability to
17 proactively search NASA information systems for
18 advanced cyber threats that otherwise evade existing
19 security tools.

20 (2) THREAT-HUNTING PROCESS.—In carrying
21 out paragraph (1), the Administrator shall develop
22 and document a threat-hunting process, including
23 the roles and responsibilities of individuals con-
24 ducting a cyber threat hunt.

1 (d) GAO PRIORITY RECOMMENDATIONS.—The Ad-
2 ministrator shall implement, to the maximum extent prac-
3 ticable, the recommendations for NASA contained in the
4 report of the Comptroller General of the United States
5 entitled “Information Security: Agencies Need to Improve
6 Controls over Selected High-Impact Systems”, issued May
7 18, 2016, including—

8 (1) re-evaluating security control assessments;
9 and

10 (2) specifying metrics for the continuous moni-
11 toring strategy of the Administration.

12 **SEC. 807. LIMITATION ON COOPERATION WITH THE PEO-**
13 **PLE’S REPUBLIC OF CHINA.**

14 (a) IN GENERAL.—Except as provided by subsection
15 (b), the Administrator, the Director of the OSTP, and the
16 Chair of the National Space Council, shall not—

17 (1) develop, design, plan, promulgate, imple-
18 ment, or execute a bilateral policy, program, order,
19 or contract of any kind to participate, collaborate, or
20 coordinate bilaterally in any manner with—

21 (A) the Government of the People’s Repub-
22 lic of China; or

23 (B) any company—

24 (i) owned by the Government of the
25 People’s Republic of China; or

1 (ii) incorporated under the laws of the
2 People's Republic of China; and

3 (2) host official visitors from the People's Re-
4 public of China at a facility belonging to or used by
5 NASA.

6 (b) WAIVER.—

7 (1) IN GENERAL.—The Administrator, the Di-
8 rector, or the Chair may waive the limitation under
9 subsection (a) with respect to an activity described
10 in that subsection only if the Administrator, the Di-
11 rector, or the Chair, as applicable, makes a deter-
12 mination that the activity—

13 (A) does not pose a risk of a transfer of
14 technology, data, or other information with na-
15 tional security or economic security implications
16 to an entity described in paragraph (1) of such
17 subsection; and

18 (B) does not involve knowing interactions
19 with officials who have been determined by the
20 United States to have direct involvement with
21 violations of human rights.

22 (2) CERTIFICATION TO CONGRESS.—Not later
23 than 30 days after the date on which a waiver is
24 granted under paragraph (1), the Administrator, the
25 Director, or the Chair, as applicable, shall submit to

1 the Committee on Commerce, Science, and Trans-
2 portation and the Committee on Appropriations of
3 the Senate and the Committee on Science, Space,
4 and Technology and the Committee on Appropria-
5 tions of the House of Representatives a written cer-
6 tification that the activity complies with the require-
7 ments in subparagraphs (A) and (B) of that para-
8 graph.

9 (c) GAO REVIEW.—

10 (1) IN GENERAL.—The Comptroller General of
11 the United States shall conduct a review of NASA
12 contracts that may subject the Administration to un-
13 acceptable transfers of intellectual property or tech-
14 nology to any entity—

15 (A) owned or controlled (in whole or in
16 part) by, or otherwise affiliated with, the Gov-
17 ernment of the People’s Republic of China; or

18 (B) organized under, or otherwise subject
19 to, the laws of the People’s Republic of China.

20 (2) ELEMENTS.—The review required under
21 paragraph (1) shall assess—

22 (A) whether the Administrator is aware—

23 (i) of any NASA contractor that bene-
24 fits from significant financial assistance
25 from—

1 (I) the Government of the Peo-
2 ple's Republic of China;

3 (II) any entity controlled by the
4 Government of the People's Republic
5 of China; or

6 (III) any other governmental en-
7 tity of the People's Republic of China;
8 and

9 (ii) that the Government of the Peo-
10 ple's Republic of China, or an entity con-
11 trolled by the Government of the People's
12 Republic of China, may be—

13 (I) leveraging United States com-
14 panies that share ownership with
15 NASA contractors; or

16 (II) obtaining intellectual prop-
17 erty or technology illicitly or by other
18 unacceptable means; and

19 (B) the steps the Administrator is taking
20 to ensure that—

21 (i) NASA contractors are not being le-
22 veraged (directly or indirectly) by the Gov-
23 ernment of the People's Republic of China
24 or by an entity controlled by the Govern-
25 ment of the People's Republic of China;

1 (ii) the intellectual property and tech-
2 nology of NASA contractors are adequately
3 protected; and

4 (iii) NASA flight-critical components
5 are not sourced from the People's Republic
6 of China through any entity benefiting
7 from Chinese investments, loans, or other
8 assistance.

9 (3) RECOMMENDATIONS.—The Comptroller
10 General shall provide to the Administrator rec-
11 ommendations for future NASA contracting based
12 on the results of the review.

13 (4) PLAN.—Not later than 180 days after the
14 date on which the Comptroller General completes the
15 review, the Administrator shall—

16 (A) develop a plan to implement the rec-
17 ommendations of the Comptroller General; and

18 (B) submit the plan to the appropriate
19 committees of Congress.

20 **SEC. 808. CONSIDERATION OF ISSUES RELATED TO CON-**
21 **TRACTING WITH ENTITIES RECEIVING AS-**
22 **SISTANCE FROM OR AFFILIATED WITH THE**
23 **PEOPLE'S REPUBLIC OF CHINA.**

24 (a) IN GENERAL.—With respect to a matter in re-
25 sponse to a request for proposal or a broad area announce-

1 ment by the Administrator, or award of any contract,
2 agreement, or other transaction with the Administrator,
3 a commercial or noncommercial entity shall certify that
4 it is not majority owned or controlled (as defined in section
5 800.208 of title 31, Code of Federal Regulations), or mi-
6 nority owned greater than 25 percent, by—

7 (1) any governmental organization of the Peo-
8 ple's Republic of China; or

9 (2) any other entity that is—

10 (A) known to be owned or controlled by
11 any governmental organization of the People's
12 Republic of China; or

13 (B) organized under, or otherwise subject
14 to, the laws of the People's Republic of China.

15 (b) FALSE STATEMENTS.—

16 (1) IN GENERAL.—A false statement contained
17 in a certification under subsection (a) constitutes a
18 false or fraudulent claim for purposes of chapter 47
19 of title 18, United States Code.

20 (2) ACTION UNDER FEDERAL ACQUISITION
21 REGULATION.—Any party convicted for making a
22 false statement with respect to a certification under
23 subsection (a) shall be subject to debarment from
24 contracting with the Administrator for a period of
25 not less than 1 year, as determined by the Adminis-

1 trator, in addition to other appropriate action in ac-
2 cordance with the Federal Acquisition Regulation
3 maintained under section 1303(a)(1) of title 41,
4 United States Code.

5 (c) ANNUAL REPORT.—The Administrator shall sub-
6 mit to the appropriate committees of Congress an annual
7 report detailing any violation of this section.

8 **SEC. 809. SMALL SATELLITE LAUNCH SERVICES PROGRAM.**

9 (a) IN GENERAL.—The Administrator shall continue
10 to procure dedicated launch services, including from small
11 and venture class launch providers, for small satellites, in-
12 cluding CubeSats, for the purpose of conducting science
13 and technology missions that further the goals of NASA.

14 (b) REQUIREMENTS.—In carrying out the program
15 under subsection (a), the Administrator shall engage with
16 the academic community to maximize awareness and use
17 of dedicated small satellite launch opportunities.

18 (c) RULE OF CONSTRUCTION.—Nothing in this sec-
19 tion shall prevent the Administrator from continuing to
20 use a secondary payload of procured launch services for
21 CubeSats.

1 **SEC. 810. 21ST CENTURY SPACE LAUNCH INFRASTRUC-**
2 **TURE.**

3 (a) IN GENERAL.—The Administrator shall carry out
4 a program to modernize multi-user launch infrastructure
5 at NASA facilities—

6 (1) to enhance safety; and

7 (2) to advance Government and commercial
8 space transportation and exploration.

9 (b) PROJECTS.—Projects funded under the program
10 under subsection (a) may include—

11 (1) infrastructure relating to commodities;

12 (2) standard interfaces to meet customer needs
13 for multiple payload processing and launch vehicle
14 processing;

15 (3) enhancements to range capacity and flexi-
16 bility; and

17 (4) such other projects as the Administrator
18 considers appropriate to meet the goals described in
19 subsection (a).

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

22 (1) identify and prioritize investments in
23 projects that can be used by multiple users and
24 launch vehicles, including non-NASA users and
25 launch vehicles; and

1 (2) limit investments to projects that would not
2 otherwise be funded by a NASA program, such as
3 an institutional or programmatic infrastructure pro-
4 gram.

5 (d) **RULE OF CONSTRUCTION.**—Nothing in this sec-
6 tion shall preclude a NASA program, including the Space
7 Launch System and Orion, from using the launch infra-
8 structure modernized under this section.

9 **SEC. 811. MISSIONS OF NATIONAL NEED.**

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

12 (1) while certain space missions, such as aster-
13 oid detection or space debris mitigation or removal
14 missions, may not provide the highest-value science,
15 as determined by the National Academies of Science,
16 Engineering, and Medicine decadal surveys, such
17 missions provide tremendous value to the United
18 States and the world; and

19 (2) the current organizational and funding
20 structure of NASA has not prioritized the funding
21 of missions of national need.

22 (b) **STUDY.**—

23 (1) **IN GENERAL.**—The Director of the OSTP
24 shall conduct a study on the manner in which NASA
25 funds missions of national need.

1 (2) MATTERS TO BE INCLUDED.—The study
2 conducted under paragraph (1) shall include the fol-
3 lowing:

4 (A) An identification and assessment of
5 the types of missions or technology development
6 programs that constitute missions of national
7 need.

8 (B) An assessment of the manner in which
9 such missions are currently funded and man-
10 aged by NASA.

11 (C) An analysis of the options for funding
12 missions of national need, including—

13 (i) structural changes required to
14 allow NASA to fund such missions; and

15 (ii) an assessment of the capacity of
16 other Federal agencies to make funds
17 available for such missions.

18 (c) REPORT TO CONGRESS.—Not later than 1 year
19 after the date of the enactment of this Act, the Director
20 of the OSTP shall submit to the appropriate committees
21 of Congress a report on the results of the study conducted
22 under subsection (b), including recommendations for fund-
23 ing missions of national need.

1 **SEC. 812. DRINKING WATER WELL REPLACEMENT FOR**
2 **CHINCOTEAGUE, VIRGINIA.**

3 Notwithstanding any other provision of law, during
4 the 5-year period beginning on the date of the enactment
5 of this Act, the Administrator may enter into 1 or more
6 agreements with the town of Chincoteague, Virginia, to
7 reimburse the town for costs that are directly associated
8 with—

9 (1) the removal of drinking water wells located
10 on property administered by the Administration; and

11 (2) the relocation of such wells to property
12 under the administrative control, through lease, own-
13 ership, or easement, of the town.

14 **SEC. 813. PASSENGER CARRIER USE.**

15 Section 1344(a)(2) of title 31, United States Code,
16 is amended—

17 (1) in subparagraph (A), by striking “or” at
18 the end;

19 (2) in subparagraph (B), by inserting “or”
20 after the comma at the end; and

21 (3) by inserting after subparagraph (B) the fol-
22 lowing:

23 “(C) necessary for post-flight transportation of
24 United States Government astronauts, and other as-
25 tronauts subject to reimbursable arrangements, re-
26 turning from space for the performance of medical

1 research, monitoring, diagnosis, or treatment, or
2 other official duties, prior to receiving post-flight
3 medical clearance to operate a motor vehicle.”.

4 **SEC. 814. USE OF COMMERCIAL NEAR-SPACE BALLOONS.**

5 (a) SENSE OF CONGRESS.—It is the sense of Con-
6 gress that the use of an array of capabilities, including
7 the use of commercially available near-space balloon as-
8 sets, is in the best interest of the United States.

9 (b) USE OF COMMERCIAL NEAR-SPACE BALLOONS.—
10 The Administrator shall use commercially available bal-
11 loon assets operating at near-space altitudes, to the max-
12 imum extent practicable, as part of a diverse set of capa-
13 bilities to effectively and efficiently meet the goals of the
14 Administration.

15 **SEC. 815. PRESIDENT’S SPACE ADVISORY BOARD.**

16 Section 121 of the National Aeronautics and Space
17 Administration Authorization Act, Fiscal Year 1991 (Pub-
18 lic Law 101–611; 51 U.S.C. 20111 note) is amended—

19 (1) in the section heading, by striking “**USERS’**
20 **ADVISORY GROUP**” and inserting “**PRESIDENT’S**
21 **SPACE ADVISORY BOARD**”; and

22 (2) by striking “Users’ Advisory Group” each
23 place it appears and inserting “President’s Space
24 Advisory Board.”

1 **SEC. 816. INITIATIVE ON TECHNOLOGIES FOR NOISE AND**
2 **EMISSIONS REDUCTIONS.**

3 (a) INITIATIVE REQUIRED.—Section 40112 of title
4 51, United States Code, is amended—

5 (1) by redesignating subsections (b) through (f)
6 as subsections (c) through (g), respectively; and

7 (2) by inserting after subsection (a) the fol-
8 lowing new subsection (b):

9 “(b) TECHNOLOGIES FOR NOISE AND EMISSIONS RE-
10 Duction.—

11 “(1) INITIATIVE REQUIRED.—The Adminis-
12 trator shall establish an initiative to build upon and
13 accelerate previous or ongoing work to develop and
14 demonstrate new technologies, including systems ar-
15 chitecture, components, or integration of systems
16 and airframe structures, in electric aircraft propul-
17 sion concepts that are capable of substantially reduc-
18 ing both emissions and noise from aircraft.

19 “(2) APPROACH.—In carrying out the initiative,
20 the Administrator shall do the following:

21 “(A) Continue and expand work of the Ad-
22 ministration on research, development, and
23 demonstration of electric aircraft concepts, and
24 the integration of such concepts.

25 “(B) To the extent practicable, work with
26 multiple partners, including small businesses

1 and new entrants, on research and development
2 activities related to transport category aircraft.

3 “(C) Provide guidance to the Federal Avia-
4 tion Administration on technologies developed
5 and tested pursuant to the initiative.”.

6 (b) **REPORTS.**—Not later than 180 days after the
7 date of the enactment of this Act, and annually thereafter
8 as a part of the Administration’s budget submission, the
9 Administrator shall submit a report to the appropriate
10 committee of Congress on the progress of the work under
11 the initiative required by subsection (b) of section 40112
12 of title 51, United States Code (as amended by subsection
13 (a) of this section), including an updated, anticipated
14 timeframe for aircraft entering into service that produce
15 50 percent less noise and emissions than the highest per-
16 forming aircraft in service as of December 31, 2019.

17 **SEC. 817. REMEDIATION OF SITES CONTAMINATED WITH**
18 **TRICHLOROETHYLENE.**

19 (a) **IDENTIFICATION OF SITES.**—Not later than 180
20 days after the date of the enactment of this Act, the Ad-
21 ministrators shall identify sites of the Administration con-
22 taminated with trichloroethylene.

23 (b) **REPORT REQUIRED.**—Not later than 1 year after
24 the date of the enactment of this Act, the Administrator

1 shall submit to the appropriate committees of Congress
2 a report that includes—

3 (1) the recommendations of the Administrator
4 for remediating the sites identified under subsection
5 (a) during the 5-year period beginning on the date
6 of the report; and

7 (2) an estimate of the financial resources nec-
8 essary to implement those recommendations.

9 **SEC. 818. REPORT ON MERITS AND OPTIONS FOR ESTAB-**
10 **LISHING AN INSTITUTE RELATING TO SPACE**
11 **RESOURCES.**

12 (a) REPORT.—

13 (1) IN GENERAL.—Not later than 180 days
14 after the date of the enactment of this Act, the Ad-
15 ministrator shall submit to the appropriate commit-
16 tees of Congress a report on the merits of, and op-
17 tions for, establishing an institute relating to space
18 resources to advance the objectives of NASA in
19 maintaining United States preeminence in space de-
20 scribed in paragraph (3).

21 (2) MATTERS TO BE INCLUDED.—The report
22 required by paragraph (1) shall include an assess-
23 ment by the Administrator as to whether—

1 (A) a virtual or physical institute relating
2 to space resources is most cost effective and ap-
3 propriate; and

4 (B) partnering with institutions of higher
5 education and the aerospace industry, and the
6 extractive industry as appropriate, would be ef-
7 fective in increasing information available to
8 such an institute with respect to advancing the
9 objectives described in paragraph (3).

10 (3) OBJECTIVES.—The objectives described in
11 this paragraph are the following:

12 (A) Identifying, developing, and distrib-
13 uting space resources, including by encouraging
14 the development of foundational science and
15 technology.

16 (B) Reducing the technological risks asso-
17 ciated with identifying, developing, and distrib-
18 uting space resources.

19 (C) Developing options for using space re-
20 sources—

21 (i) to support current and future
22 space architectures, programs, and mis-
23 sions; and

1 (ii) to enable architectures, programs,
2 and missions that would not otherwise be
3 possible.

4 (4) DEFINITIONS.—In this section:

5 (A) EXTRACTIVE INDUSTRY.—The term
6 “extractive industry” means a company or indi-
7 vidual involved in the process of extracting (in-
8 cluding mining, quarrying, drilling, and dredg-
9 ing) space resources.

10 (B) INSTITUTION OF HIGHER EDU-
11 CATION.—The term “institution of higher edu-
12 cation” has the meaning given the term in sec-
13 tion 101(a) of the Higher Education Act of
14 1965 (20 U.S.C. 1001(a)).

15 (C) SPACE RESOURCE.—

16 (i) IN GENERAL.—The term “space
17 resource” means an abiotic resource in situ
18 in outer space.

19 (ii) INCLUSIONS.—The term “space
20 resource” includes a raw material, a nat-
21 ural material, and an energy source.

22 **SEC. 819. REPORT ON ESTABLISHING CENTER OF EXCEL-**
23 **LENCE FOR SPACE WEATHER TECHNOLOGY.**

24 (a) IN GENERAL.—Not later than 180 days after the
25 date of the enactment of this Act, the Administrator shall

1 submit to the appropriate committees of Congress a report
2 assessing the potential benefits of establishing a NASA
3 center of excellence for space weather technology.

4 (b) GEOGRAPHIC CONSIDERATIONS.—In the report
5 required by subsection (a), the Administrator shall con-
6 sider the benefits of establishing the center of excellence
7 described in that subsection in a geographic area—

8 (1) in close proximity to—

9 (A) significant government-funded space
10 weather research activities; and

11 (B) institutions of higher education; and

12 (2) where NASA may have been previously
13 underrepresented.

14 **SEC. 820. REVIEW ON PREFERENCE FOR DOMESTIC SUP-**
15 **PLIERS.**

16 (a) SENSE OF CONGRESS.—It is the Sense of Con-
17 gress that the Administration should, to the maximum ex-
18 tent practicable and with due consideration of foreign pol-
19 icy goals and obligations under Federal law—

20 (1) use domestic suppliers of goods and serv-
21 ices; and

22 (2) ensure compliance with the Federal acquisi-
23 tion regulations, including subcontract flow-down
24 provisions.

25 (b) REVIEW.—

1 (1) IN GENERAL.—Not later than 180 days
2 after the date of the enactment of this Act, the Ad-
3 ministrator shall undertake a comprehensive review
4 of the domestic supplier preferences of the Adminis-
5 tration and the obligations of the Administration
6 under the Federal acquisition regulations to ensure
7 compliance, particularly with respect to Federal ac-
8 quisition regulations provisions that apply to foreign-
9 based subcontractors.

10 (2) ELEMENTS.—The review under paragraph
11 (1) shall include—

12 (A) an assessment as to whether the Ad-
13 ministration has provided funding for infra-
14 structure of a foreign-owned company or State-
15 sponsored entity in recent years; and

16 (B) a review of any impact such funding
17 has had on domestic service providers.

18 (c) REPORT.—The Administrator shall submit to the
19 appropriate committees of Congress a report on the re-
20 sults of the review.

21 **SEC. 821. REPORT ON UTILIZATION OF COMMERCIAL**
22 **SPACEPORTS LICENSED BY FEDERAL AVIA-**
23 **TION ADMINISTRATION.**

24 (a) IN GENERAL.—Not later than 1 year after the
25 date of the enactment of this Act, the Administrator shall

1 submit to the appropriate committees of Congress a report
2 on the benefits of increased utilization of commercial
3 spaceports licensed by the Federal Aviation Administra-
4 tion for NASA civil space missions and operations.

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

7 (1) A description and assessment of current uti-
8 lization of commercial spaceports licensed by the
9 Federal Aviation Administration for NASA civil
10 space missions and operations.

11 (2) A description and assessment of the benefits
12 of increased utilization of such spaceports for such
13 missions and operations.

14 (3) A description and assessment of the steps
15 necessary to achieve increased utilization of such
16 spaceports for such missions and operations.

17 **SEC. 822. ACTIVE ORBITAL DEBRIS MITIGATION.**

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

20 (1) orbital debris, particularly in low-Earth
21 orbit, poses a hazard to NASA missions, particularly
22 human spaceflight; and

23 (2) progress has been made on the development
24 of guidelines for long-term space sustainability

1 through the United Nations Committee on the
2 Peaceful Uses of Outer Space.

3 (b) REQUIREMENTS.—The Administrator should—

4 (1) ensure the policies and standard practices
5 of NASA meet or exceed international guidelines for
6 spaceflight safety; and

7 (2) support the development of orbital debris
8 mitigation technologies through continued research
9 and development of concepts.

10 (c) REPORT TO CONGRESS.—Not later than 90 days
11 after the date of the enactment of this Act, the Adminis-
12 trator shall submit to the appropriate committees of Con-
13 gress a report on the status of implementing subsection
14 (b).

15 **SEC. 823. STUDY ON COMMERCIAL COMMUNICATIONS**
16 **SERVICES.**

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

19 (1) enhancing the ability of researchers to con-
20 duct and interact with experiments while in flight
21 would make huge advancements in the overall profit-
22 ability of conducting research on suborbit and low-
23 Earth orbit payloads; and

1 (2) current NASA communications do not allow
2 for real-time data collection, observation, or trans-
3 mission of information.

4 (b) STUDY.—The Administrator shall conduct a
5 study on the feasibility, impact, and cost of using commer-
6 cial communications programs services for suborbital
7 flight programs and low-Earth orbit research.

8 (c) REPORT.—Not later than 18 months after the
9 date of the enactment of this Act, the Administrator shall
10 submit to Congress and make publicly available a report
11 that describes the results of the study conducted under
12 subsection (b).