

118TH CONGRESS  
2D SESSION

# S. 4178

To establish artificial intelligence standards, metrics, and evaluation tools, to support artificial intelligence research, development, and capacity building activities, to promote innovation in the artificial intelligence industry by ensuring companies of all sizes can succeed and thrive, and for other purposes.

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## IN THE SENATE OF THE UNITED STATES

APRIL 18, 2024

Ms. CANTWELL (for herself, Mr. YOUNG, Mr. HICKENLOOPER, and Mrs. BLACKBURN) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

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## A BILL

To establish artificial intelligence standards, metrics, and evaluation tools, to support artificial intelligence research, development, and capacity building activities, to promote innovation in the artificial intelligence industry by ensuring companies of all sizes can succeed and thrive, and for other purposes.

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

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

4 (a) SHORT TITLE.—This Act may be cited as the  
5 “Future of Artificial Intelligence Innovation Act of 2024”.

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

- Sec. 1. Short title; table of contents.
- Sec. 2. Sense of Congress.
- Sec. 3. Definitions.

TITLE I—VOLUNTARY ARTIFICIAL INTELLIGENCE STANDARDS,  
 METRICS, EVALUATION TOOLS, TESTBEDS, AND INTER-  
 NATIONAL COOPERATION

Subtitle A—Artificial Intelligence Safety Institute and Testbeds

- Sec. 101. Artificial Intelligence Safety Institute.
- Sec. 102. Program on artificial intelligence testbeds.
- Sec. 103. National Institute of Standards and Technology and Department of Energy testbed to identify, test, and synthesize new materials.
- Sec. 104. National Science Foundation and Department of Energy collaboration to make scientific discoveries through the use of artificial intelligence.
- Sec. 105. Progress report.

Subtitle B—International Cooperation

- Sec. 111. International coalition on innovation, development, and harmonization of standards with respect to artificial intelligence.
- Sec. 112. Requirement to support bilateral and multilateral artificial intelligence research collaborations.

Subtitle C—Identifying Regulatory Barriers to Innovation

- Sec. 121. Comptroller General of the United States identification of risks and obstacles relating to artificial intelligence and Federal agencies.

TITLE II—ARTIFICIAL INTELLIGENCE RESEARCH,  
 DEVELOPMENT, CAPACITY BUILDING ACTIVITIES

- Sec. 201. Public data for artificial intelligence systems.
- Sec. 202. Federal grand challenges in artificial intelligence.

3 **SEC. 2. SENSE OF CONGRESS.**

4 It is the sense of Congress that policies governing ar-  
 5 tificial intelligence should maximize the potential and de-  
 6 velopment of artificial intelligence to benefit all private  
 7 and public stakeholders.

8 **SEC. 3. DEFINITIONS.**

9 In this Act:

1           (1) AGENCY.—The term “agency” has the  
2 meaning given such term in section 3502 of title 44,  
3 United States Code, except such term shall include  
4 an independent regulatory agency, as defined in such  
5 section.

6           (2) ARTIFICIAL INTELLIGENCE.—The term “ar-  
7 tificial intelligence” has the meaning given such  
8 term in section 5002 of the National Artificial Intel-  
9 ligence Initiative Act of 2020 (15 U.S.C. 9401).

10           (3) ARTIFICIAL INTELLIGENCE BLUE-  
11 TEAMING.—The term “artificial intelligence blue-  
12 teaming” means an effort to conduct operational  
13 network vulnerability evaluations and provide miti-  
14 gation techniques to entities who have a need for an  
15 independent technical review of the network security  
16 posture of an artificial intelligence system.

17           (4) ARTIFICIAL INTELLIGENCE MODEL.—The  
18 term “artificial intelligence model” means a compo-  
19 nent of an artificial intelligence system that is a  
20 model—

21                   (A) derived using mathematical, computa-  
22 tional, statistical, or machine-learning tech-  
23 niques; and

1 (B) used as part of an artificial intel-  
2 ligence system to produce outputs from a given  
3 set of inputs.

4 (5) ARTIFICIAL INTELLIGENCE RED-  
5 TEAMING.—The term “artificial intelligence red-  
6 teaming” means structured adversarial testing ef-  
7 forts of an artificial intelligence system to identify  
8 risks, flaws, and vulnerabilities of the artificial intel-  
9 ligence system, such as harmful outputs from the  
10 system, unforeseen or undesirable system behaviors,  
11 limitations, or potential risks associated with the  
12 misuse of the system.

13 (6) ARTIFICIAL INTELLIGENCE RISK MANAGE-  
14 MENT FRAMEWORK.—The term “Artificial Intel-  
15 ligence Risk Management Framework” means the  
16 most recently updated version of the framework de-  
17 veloped and updated pursuant to section 22A(c) of  
18 the National Institute of Standards and Technology  
19 Act (15 U.S.C. 278h–1(c)).

20 (7) ARTIFICIAL INTELLIGENCE SYSTEM.—The  
21 term “artificial intelligence system” has the meaning  
22 given such term in section 7223 of the Advancing  
23 American AI Act (40 U.S.C. 11301 note).

24 (8) CRITICAL INFRASTRUCTURE.—The term  
25 “critical infrastructure” has the meaning given such

1 term in section 1016(e) of the Uniting and  
2 Strengthening America by Providing Appropriate  
3 Tools Required to Intercept and Obstruct Terrorism  
4 (USA PATRIOT ACT) Act of 2001 (42 U.S.C.  
5 5195c(e)).

6 (9) FEDERAL LABORATORY.—The term “Fed-  
7 eral laboratory” has the meaning given such term in  
8 section 4 of the Stevenson-Wydler Technology Inno-  
9 vation Act of 1980 (15 U.S.C. 3703).

10 (10) FOUNDATION MODEL.—The term “founda-  
11 tion model” means an artificial intelligence model  
12 trained on broad data at scale and is adaptable to  
13 a wide range of downstream tasks.

14 (11) GENERATIVE ARTIFICIAL INTEL-  
15 LIGENCE.—The term “generative artificial intel-  
16 ligence” means the class of artificial intelligence  
17 models that utilize the structure and characteristics  
18 of input data in order to generate outputs in the  
19 form of derived synthetic content. Such derived syn-  
20 thetic content can include images, videos, audio,  
21 text, software, code, and other digital content.

22 (12) NATIONAL LABORATORY.—The term “Na-  
23 tional Laboratory” has the meaning given such term  
24 in section 2 of the Energy Policy Act of 2005 (42  
25 U.S.C. 15801).

1           (13) SYNTHETIC CONTENT.—The term “syn-  
2           thetic content” means information, such as images,  
3           videos, audio clips, and text, that has been signifi-  
4           cantly modified or generated by algorithms, includ-  
5           ing by artificial intelligence.

6           (14) TESTBED.—The term “testbed” means a  
7           facility or mechanism equipped for conducting rig-  
8           orous, transparent, and replicable testing of tools  
9           and technologies, including artificial intelligence sys-  
10          tems, to help evaluate the functionality, trust-  
11          worthiness, usability, and performance of those tools  
12          or technologies.

13          (15) TEVV.—The term “TEVV” means meth-  
14          odologies, metrics, techniques, and tasks for testing,  
15          evaluating, verifying, and validating artificial intel-  
16          ligence systems or components.

17          (16)           WATERMARKING.—The           term  
18          “watermarking” means the act of embedding infor-  
19          mation that is intended to be difficult to remove,  
20          into outputs generated by artificial intelligence, in-  
21          cluding outputs such as text, images, audio, videos,  
22          software code, or any other digital content or data,  
23          for the purposes of verifying the authenticity of the  
24          output or the identity or characteristics of its prove-  
25          nance, modifications, or conveyance.

1 **TITLE I—VOLUNTARY ARTIFI-**  
2 **CIAL INTELLIGENCE STAND-**  
3 **ARDS, METRICS, EVALUATION**  
4 **TOOLS, TESTBEDS, AND**  
5 **INTERNATIONAL COOPERA-**  
6 **TION**

7 **Subtitle A—Artificial Intelligence**  
8 **Safety Institute and Testbeds**

9 **SEC. 101. ARTIFICIAL INTELLIGENCE SAFETY INSTITUTE.**

10 (a) ESTABLISHMENT OF INSTITUTE.—

11 (1) IN GENERAL.—Not later than 1 year after  
12 the date of the enactment of this Act, the Under  
13 Secretary of Commerce for Standards and Tech-  
14 nology (in this section referred to as the “Under  
15 Secretary”) shall establish an institute on artificial  
16 intelligence.

17 (2) DESIGNATION.—The institute established  
18 pursuant to paragraph (1) shall be known as the  
19 “Artificial Intelligence Safety Institute” (in this sec-  
20 tion referred to as the “Institute”).

21 (3) MISSION.—The mission of the Institute is  
22 as follows:

23 (A) To assist the private sector and agen-  
24 cies in developing voluntary best practices for

1 the robust assessment of artificial intelligence  
2 systems.

3 (B) To provide technical assistance for the  
4 adoption and use of artificial intelligence across  
5 the Federal Government to improve the quality  
6 of government services.

7 (C) To develop guidelines, methodologies,  
8 and best practices to promote—

9 (i) development and adoption of vol-  
10 untary, consensus-based technical stand-  
11 ards or industry standards;

12 (ii) long-term advancements in artifi-  
13 cial intelligence technologies; and

14 (iii) innovation in the artificial intel-  
15 ligence industry by ensuring that compa-  
16 nies of all sizes can succeed and thrive.

17 (b) DIRECTOR.—The Under Secretary shall appoint  
18 a director of the Institute, who shall be known as the “Di-  
19 rector of the Artificial Intelligence Safety Institute” (in  
20 this section referred to as the “Director”) and report di-  
21 rectly to the Under Secretary.

22 (c) STAFF AND AUTHORITIES.—

23 (1) STAFF.—The Director may hire such full-  
24 time employees as the Director considers appropriate

1 to assist the Director in carrying out the functions  
2 of the Institute.

3 (2) USE OF AUTHORITY TO HIRE CRITICAL  
4 TECHNICAL EXPERTS.—In addition to making ap-  
5 pointments under paragraph (1) of this subsection,  
6 the Director, in coordination with the Secretary of  
7 Commerce, may make appointments of scientific, en-  
8 gineering, and professional personnel, and fix their  
9 basic pay, under subsection (b) of section 6 of the  
10 National Institute of Standards and Technology Act  
11 (15 U.S.C. 275) to hire critical technical experts.

12 (3) EXPANSION OF AUTHORITY TO HIRE CRIT-  
13 ICAL TECHNICAL EXPERTS.—Such subsection is  
14 amended, in the second sentence, by striking “15”  
15 and inserting “30”.

16 (4) MODIFICATION OF SUNSET.—Subsection (c)  
17 of such section is amended by striking “the date  
18 that is 5 years after the date of the enactment of  
19 this section” and inserting “December 30, 2035”.

20 (5) AGREEMENTS.—The Director may enter  
21 into such agreements, including contracts, grants,  
22 cooperative agreements, and other transactions, as  
23 the Director considers necessary to carry out the  
24 functions of the Institute and on such terms as the  
25 Under Secretary considers appropriate.

1 (d) CONSULTATION AND COORDINATION.—In estab-  
2 lishing the Institute, the Under Secretary shall—

3 (1) coordinate with—

4 (A) the Secretary of Energy;

5 (B) the Secretary of Homeland Security;

6 (C) the Secretary of Defense;

7 (D) the Director of the National Science  
8 Foundation; and

9 (E) the Director of the Office of Science  
10 and Technology Policy; and

11 (2) consult with the heads of such other Fed-  
12 eral agencies as the Under Secretary considers ap-  
13 propriate.

14 (e) FUNCTIONS.—The functions of the Institute,  
15 which the Institute shall carry out in coordination with  
16 the laboratories of the National Institute of Standards and  
17 Technology, are as follows:

18 (1) RESEARCH, EVALUATION, TESTING, AND  
19 STANDARDS.—The following functions relating to re-  
20 search, evaluation, testing, and standards:

21 (A) Conducting measurement research into  
22 system and model safety, validity and reli-  
23 ability, security, capabilities and limitations,  
24 explainability, interpretability, and privacy.

1 (B) Working with the Department of En-  
2 ergy, the National Science Foundation, public-  
3 private partnerships, including the Artificial In-  
4 telligence Safety Institute Consortium estab-  
5 lished under subsection (f), and other private  
6 sector organizations to develop testing environ-  
7 ments and perform regular benchmarking and  
8 capability evaluations, including artificial intel-  
9 ligence red-teaming as the Director considers  
10 appropriate.

11 (C) Working with consensus-based, open,  
12 and transparent standards development organi-  
13 zations (SDOs) and relevant industry, Federal  
14 laboratories, civil society, and academic institu-  
15 tions to advance development and adoption of  
16 clear, implementable, technically sound, and  
17 technology-neutral voluntary standards and  
18 guidelines that incorporate appropriate vari-  
19 ations in approach depending on the size of the  
20 entity, the potential risks and potential benefits  
21 of the artificial intelligence system, and the role  
22 of the entity (such as developer, deployer, or  
23 user) relating to artificial intelligence systems.

24 (D) Building upon the Artificial Intel-  
25 ligence Risk Management Framework to incor-

1           porate guidelines on generative artificial intel-  
2           ligence systems.

3           (E) Developing a companion resource to  
4           the Secure Software Development Framework  
5           to incorporate secure development practices for  
6           generative artificial intelligence and for founda-  
7           tion models.

8           (F) Developing and publishing cybersecu-  
9           rity tools, methodologies, best practices, vol-  
10          untary guidelines, and other supporting infor-  
11          mation to assist persons who maintain systems  
12          used to create or train artificial intelligence  
13          models to discover and mitigate vulnerabilities  
14          and attacks.

15          (G) Coordinating or developing guidelines,  
16          metrics, benchmarks, and methodologies for  
17          evaluating artificial intelligence systems, includ-  
18          ing the following:

19               (i) Cataloging existing artificial intel-  
20               ligence metrics, benchmarks, and evalua-  
21               tion methodologies used in industry and  
22               academia.

23               (ii) Testing and validating the efficacy  
24               of existing metrics, benchmarks, and eval-

1                   uations, as well as TEVV tools and prod-  
2                   ucts.

3                   (iii) Funding and facilitating research  
4                   and other activities in a transparent man-  
5                   ner, including at institutions of higher edu-  
6                   cation and other nonprofit and private sec-  
7                   tor partners, to evaluate, develop, or im-  
8                   prove TEVV capabilities, with rigorous sci-  
9                   entific merit, for artificial intelligence sys-  
10                  tems.

11                  (iv) Evaluating foundation models for  
12                  their potential effect in downstream sys-  
13                  tems, such as when retrained or fine-  
14                  tuned.

15                  (H) Coordinating with counterpart institu-  
16                  tions of international partners and allies to pro-  
17                  mote global interoperability in the development  
18                  of research, evaluation, testing, and standards  
19                  relating to artificial intelligence.

20                  (I) Developing tools, methodologies, best  
21                  practices, and voluntary guidelines for identi-  
22                  fying vulnerabilities in foundation models.

23                  (J) Developing tools, methodologies, best  
24                  practices, and voluntary guidelines for relevant

1 agencies to track incidents resulting in harm  
2 caused by artificial intelligence systems.

3 (2) IMPLEMENTATION.—The following func-  
4 tions relating to implementation:

5 (A) Using publicly available and volun-  
6 tarily provided information, conducting evalua-  
7 tions to assess the impacts of artificial intel-  
8 ligence systems, and developing guidelines and  
9 practices for safe development, deployment, and  
10 use of artificial intelligence technology.

11 (B) Aligning capability evaluation and red-  
12 teaming guidelines and benchmarks, sharing  
13 best practices, and coordinating on building  
14 testbeds and test environments with allies of  
15 the United States and international partners  
16 and allies.

17 (C) Coordinating vulnerability and incident  
18 data sharing with international partners and al-  
19 lies.

20 (D) Integrating appropriate testing capa-  
21 bilities and infrastructure for testing of models  
22 and systems.

23 (E) Establishing blue-teaming capabilities  
24 to develop mitigation approaches and partner

1 with industry to address risks and negative im-  
2 pacts.

3 (F) Developing voluntary guidelines on—

4 (i) detecting synthetic content, au-  
5 thenticating content and tracking of the  
6 provenance of content, labeling original  
7 and synthetic content, such as by  
8 watermarking, and evaluating software and  
9 systems relating to detection and labeling  
10 of synthetic content;

11 (ii) ensuring artificial intelligence sys-  
12 tems do not violate privacy rights or other  
13 rights; and

14 (iii) transparency documentation of  
15 artificial intelligence datasets and artificial  
16 intelligence models.

17 (G) Coordinating with relevant agencies to  
18 develop or support, as the heads of the agencies  
19 determine appropriate, sector- and application-  
20 specific profiles of the Artificial Intelligence  
21 Risk Management Framework for different use  
22 cases, integrating end-user experience and on-  
23 going development work into a continuously  
24 evolving toolkit.

1           (3) OPERATIONS AND ENGAGEMENT.—The fol-  
2           lowing functions relating to operations and engage-  
3           ment:

4                   (A) Managing the work of the Institute,  
5                   developing internal processes, and ensuring that  
6                   the Institute meets applicable goals and targets.

7                   (B) Engaging with the private sector to  
8                   promote innovation and competitiveness.

9                   (C) Engaging with international standards  
10                  organizations, multilateral organizations, and  
11                  similar institutes among allies and partners.

12          (f) ARTIFICIAL INTELLIGENCE SAFETY INSTITUTE  
13          CONSORTIUM.—

14                  (1) ESTABLISHMENT.—

15                   (A) IN GENERAL.—Not later than 180  
16                   days after the date of the enactment of this  
17                   Act, the Under Secretary shall establish a con-  
18                   sortium of stakeholders from academic or re-  
19                   search communities, Federal laboratories, pri-  
20                   vate industry, including companies of all sizes  
21                   with different roles in the use of artificial intel-  
22                   ligence systems, including developers, deployers,  
23                   and users, and civil society with expertise in  
24                   matters relating to artificial intelligence to sup-

1 port the Institute in carrying out the functions  
2 set forth under subsection (e).

3 (B) DESIGNATION.—The consortium es-  
4 tablished pursuant to subparagraph (A) shall be  
5 known as the “Artificial Intelligence Safety In-  
6 stitute Consortium”.

7 (2) CONSULTATION.—The Under Secretary,  
8 acting through the Director, shall consult with the  
9 consortium established under this subsection not less  
10 frequently than quarterly.

11 (3) REPORT TO CONGRESS.—Not later than 2  
12 years after the date of the enactment of this Act, the  
13 Director of the National Institute of Standards and  
14 Technology shall submit to the Committee on Com-  
15 merce, Science, and Transportation of the Senate  
16 and the Committee on Science, Space, and Tech-  
17 nology of the House of Representatives a report  
18 summarizing the contributions of the members of  
19 the consortium established under this subsection in  
20 support the efforts of the Institute.

21 (g) ARTIFICIAL INTELLIGENCE SYSTEM TESTING.—  
22 In carrying out the Institute functions required by sub-  
23 section (a), the Under Secretary shall support and con-  
24 tribute to the development of voluntary, consensus-based  
25 technical standards for testing artificial intelligence sys-

1 tem components, including, as the Under Secretary con-  
2 siders appropriate, the following:

3 (1) Physical infrastructure for training or de-  
4 veloping artificial intelligence models and systems,  
5 including cloud infrastructure.

6 (2) Physical infrastructure for operating artifi-  
7 cial intelligence systems, including cloud infrastruc-  
8 ture.

9 (3) Data for training artificial intelligence mod-  
10 els.

11 (4) Data for evaluating the functionality and  
12 trustworthiness of trained artificial intelligence mod-  
13 els and systems.

14 (5) Trained or partially trained artificial intel-  
15 ligence models and any resulting software systems or  
16 products.

17 (h) GIFTS.—

18 (1) AUTHORITY.—The Director may seek, ac-  
19 cept, hold, administer, and use gifts from public and  
20 private sources whenever the Director determines it  
21 would be in the interest of the United States to do  
22 so.

23 (2) REGULATIONS.—The Director, in consulta-  
24 tion with the Director of the Office of Government  
25 Ethics, shall ensure that authority under this sub-

1 section is exercised consistent with all relevant eth-  
2 ical constraints and principles, including—

3 (A) the avoidance of any prohibited conflict  
4 of interest or appearance of impropriety; and

5 (B) a prohibition against the acceptance of  
6 a gift from a foreign government or an agent  
7 of a foreign government.

8 (i) **RULE OF CONSTRUCTION.**—Nothing in this sec-  
9 tion shall be construed to provide the Director of the Na-  
10 tional Institute of Standards and Technology any enforce-  
11 ment authority that was not in effect on the day before  
12 the date of the enactment of this Act.

13 **SEC. 102. PROGRAM ON ARTIFICIAL INTELLIGENCE**  
14 **TESTBEDS.**

15 (a) **DEFINITIONS.**—In this section:

16 (1) **APPROPRIATE COMMITTEES OF CON-**  
17 **GRESS.**—The term “appropriate committees of Con-  
18 gress” means—

19 (A) the Committee on Commerce, Science,  
20 and Transportation and the Committee on En-  
21 ergy and Natural Resources of the Senate; and

22 (B) the Committee on Science, Space, and  
23 Technology of the House of Representatives.

24 (2) **DIRECTOR.**—The term “Director” means  
25 the Director of the National Science Foundation.

1           (3) INSTITUTE.—The term “Institute” means  
2           the Artificial Intelligence Safety Institute established  
3           by section 101.

4           (4) SECRETARY.—The term “Secretary” means  
5           the Secretary of Energy.

6           (5) UNDER SECRETARY.—The term “Under  
7           Secretary” means the Under Secretary of Commerce  
8           for Standards and Technology.

9           (b) PROGRAM REQUIRED.—Not later than 180 days  
10          after the date of the enactment of this Act, the Under  
11          Secretary shall, in coordination with the Secretary and the  
12          Director, establish and commence carrying out a testbed  
13          program to encourage collaboration and support partner-  
14          ships between the National Laboratories, the National In-  
15          stitute of Standards and Technology, the National Artifi-  
16          cial Intelligence Research Resource pilot program estab-  
17          lished by the Director of the National Science Foundation,  
18          or any successor program, and public and private sector  
19          entities, including companies of all sizes, to conduct re-  
20          search and development, tests, evaluations, and risk as-  
21          sessments of artificial intelligence systems, including  
22          measurement methodologies developed by the Institute.

23          (c) ACTIVITIES.—In carrying out this program, the  
24          Under Secretary shall, in coordination with the Sec-  
25          retary—

1           (1) use the advanced computing resources,  
2           testbeds, and expertise of the National Laboratories,  
3           the Institute, the National Science Foundation, and  
4           private sector entities to run tests and evaluations  
5           on the capabilities and limitations of artificial intel-  
6           ligence systems;

7           (2) use existing solutions to the maximum ex-  
8           tent practicable;

9           (3) develop automated and reproducible tests,  
10          evaluations, and risk assessments for artificial intel-  
11          ligence systems to the extent that is practicable;

12          (4) assess the computational resources nec-  
13          essary to run tests, evaluations, and risk assess-  
14          ments of artificial intelligence systems;

15          (5) research methods to effectively minimize the  
16          computational resources needed to run tests, evalua-  
17          tions, and risk assessments of artificial intelligence  
18          systems;

19          (6) consider developing tests, evaluations, and  
20          risk assessments for artificial intelligence systems  
21          that are designed for high-, medium-, and low-com-  
22          putational intensity; and

23          (7) prioritize identifying and evaluating sce-  
24          narios in which the artificial intelligence systems  
25          tested or evaluated by a testbed could be deployed

1 in a way that poses security risks, and either estab-  
2 lishing classified testbeds, or utilizing existing classi-  
3 fied testbeds, at the National Laboratories if nec-  
4 essary, including with respect to—

5 (A) autonomous offensive cyber capabili-  
6 ties;

7 (B) cybersecurity vulnerabilities in the ar-  
8 tificial intelligence software ecosystem and be-  
9 yond;

10 (C) chemical, biological, radiological, nu-  
11 clear, critical infrastructure, and energy-secu-  
12 rity threats or hazards; and

13 (D) such other capabilities as the Under  
14 Secretary determines necessary.

15 (d) CONSIDERATION GIVEN.—In carrying out the ac-  
16 tivities required by subsection (c), the Under Secretary  
17 shall, in coordination with the Secretary, take under con-  
18 sideration the applicability of any tests, evaluations, and  
19 risk assessments to artificial intelligence systems trained  
20 using primarily biological sequence data, including those  
21 systems used for gene synthesis.

22 (e) METRICS.—The Under Secretary, in collaboration  
23 with the Secretary, shall develop metrics—

1           (1) to assess the effectiveness of the program in  
2           encouraging collaboration and supporting partner-  
3           ships as described in subsection (b); and

4           (2) to assess the impact of the program on pub-  
5           lic and private sector integration and use of artificial  
6           intelligence systems.

7           (f) USE OF EXISTING PROGRAM.—In carrying out  
8           the program required by subsection (a), the Under Sec-  
9           retary may, in collaboration with the Secretary and the  
10          Director, use a program that was in effect on the day be-  
11          fore the date of the enactment of this Act.

12          (g) EVALUATION AND FINDINGS.—Not later than 3  
13          years after the start of this program, the Under Secretary  
14          shall, in collaboration with the Secretary—

15               (1) evaluate the success of the program in en-  
16               couraging collaboration and supporting partnerships  
17               as described in subsection (b), using the metrics de-  
18               veloped pursuant to subsection (e);

19               (2) evaluate the success of the program in en-  
20               couraging public and private sector integration and  
21               use of artificial intelligence systems by using the  
22               metrics developed pursuant to subsection (e); and

23               (3) submit to the appropriate committees of  
24               Congress the evaluation supported pursuant to para-  
25               graph (1) and the findings of the Under Secretary,

1 the Secretary, and the Director with respect to the  
2 testbed program.

3 (h) CONSULTATION.—In carrying out subsection (b),  
4 the Under Secretary shall consult, as the Under Secretary  
5 considers appropriate, with the following:

6 (1) Industry, including private artificial intel-  
7 ligence laboratories, companies of all sizes, and rep-  
8 resentatives from the United States financial sector.

9 (2) Academia and institutions of higher edu-  
10 cation.

11 (3) Civil society.

12 (4) Third-party evaluators.

13 (i) ESTABLISHMENT OF FOUNDATION MODELS TEST  
14 PROGRAM.—In carrying out the program under subsection  
15 (b), the Under Secretary shall, acting through the Direc-  
16 tor of the Institute and in coordination with the Secretary  
17 of Energy, carry out a test program to provide vendors  
18 of foundation models the opportunity to voluntarily test  
19 foundation models across a range of modalities, such as  
20 models that ingest and output text, images, audio, video,  
21 software code, and mixed modalities, relative to the Artifi-  
22 cial Intelligence Risk Management Framework, by—

23 (1) conducting research and regular testing to  
24 improve and benchmark the accuracy, efficacy, and  
25 bias of foundation models;

1           (2) conducting research to identify key capabili-  
2           ties, limitations, and unexpected behaviors of foun-  
3           dation models;

4           (3) identifying and evaluating scenarios in  
5           which these models could pose risks;

6           (4) establishing reference use cases for founda-  
7           tion models and performance criteria for assessing  
8           each use case, including accuracy, efficacy, and bias  
9           metrics;

10          (5) enabling developers and deployers of foun-  
11          dation models to evaluate such systems for risks, in-  
12          cidents, and vulnerabilities if deployed in such use  
13          cases;

14          (6) coordinating public evaluations, which may  
15          include prizes and challenges, to evaluate foundation  
16          models; and

17          (7) as the Under Secretary and the Secretary  
18          consider appropriate, producing public-facing reports  
19          of the findings from such testing for a general audi-  
20          ence.

21          (j) **RULE OF CONSTRUCTION.**—Nothing in this sec-  
22          tion shall be construed to require a person to disclose any  
23          information, including information—

24                 (1) relating to a trade secret or other protected  
25                 intellectual property right;

- 1           (2) that is confidential business information; or  
2           (3) that is privileged.

3 **SEC. 103. NATIONAL INSTITUTE OF STANDARDS AND TECH-**  
4 **NOLOGY AND DEPARTMENT OF ENERGY**  
5 **TESTBED TO IDENTIFY, TEST, AND SYN-**  
6 **THESIZE NEW MATERIALS.**

7           (a) **TESTBED AUTHORIZED.**—The Secretary of Com-  
8 merce, acting through the Director of the National Insti-  
9 tute of Standards and Technology, and the Secretary of  
10 Energy shall jointly establish a testbed to identify, test,  
11 and synthesize new materials to advance materials science  
12 and to support advanced manufacturing for the benefit of  
13 the United States economy through the use of artificial  
14 intelligence, autonomous laboratories, and artificial intel-  
15 ligence integrated with emerging technologies, such as  
16 quantum hybrid computing and robotics.

17           (b) **SUPPORT FOR ACCELERATED TECHNOLOGIES.**—  
18 The Secretary of Commerce and the Secretary of Energy  
19 shall ensure that technologies accelerated using the  
20 testbed established pursuant to subsection (a) are sup-  
21 ported by advanced algorithms and models, uncertainty  
22 quantification, and software and workforce development  
23 tools to produce benchmark data, model comparison tools,  
24 and best practices guides.

1 (c) PUBLIC-PRIVATE PARTNERSHIPS.—In carrying  
2 out subsection (a), the Secretary of Commerce and the  
3 Secretary of Energy shall, in consultation with industry,  
4 civil society, and academia, enter into such public-private  
5 partnerships as the Secretaries jointly determine appro-  
6 priate.

7 (d) RESOURCES.—In carrying out subsection (a), the  
8 Secretaries may use resources from National Laboratories  
9 and the private sector.

10 **SEC. 104. NATIONAL SCIENCE FOUNDATION AND DEPART-**  
11 **MENT OF ENERGY COLLABORATION TO MAKE**  
12 **SCIENTIFIC DISCOVERIES THROUGH THE**  
13 **USE OF ARTIFICIAL INTELLIGENCE.**

14 (a) IN GENERAL.—The Director of the National  
15 Science Foundation (referred to in this section as the “Di-  
16 rector”) and the Secretary of Energy (referred to in this  
17 section as the “Secretary”) shall collaborate to support  
18 new translational scientific discoveries and advancements  
19 for the benefit of the economy of the United States  
20 through the use of artificial intelligence, including artifi-  
21 cial intelligence integrated with emerging technologies,  
22 such as quantum hybrid computing and robotics.

23 (b) PUBLIC-PRIVATE PARTNERSHIPS.—In carrying  
24 out subsection (a), the Director and the Secretary shall

1 enter into such public-private partnerships as the Director  
2 and the Secretary jointly determine appropriate.

3 (c) RESOURCES.—In carrying out subsection (a), the  
4 Director and the Secretary may accept and use resources  
5 from the National Laboratories, resources from the pri-  
6 vate sector, and academic resources.

7 **SEC. 105. PROGRESS REPORT.**

8 Not later than 1 year after the date of the enactment  
9 of this Act, the Director of the Artificial Intelligence Safe-  
10 ty Institute shall, in coordination with the Secretary of  
11 Commerce and the Secretary of Energy, submit to Con-  
12 gress a report on the implementation of this subtitle.

13 **Subtitle B—International**  
14 **Cooperation**

15 **SEC. 111. INTERNATIONAL COALITION ON INNOVATION, DE-**  
16 **VELOPMENT, AND HARMONIZATION OF**  
17 **STANDARDS WITH RESPECT TO ARTIFICIAL**  
18 **INTELLIGENCE.**

19 (a) IN GENERAL.—The Secretary of Commerce, the  
20 Secretary of State, and the Director of the Office of  
21 Science and Technology Policy (in this section referred to  
22 as the “Director”), in consultation with the heads of rel-  
23 evant agencies, shall jointly seek to form an alliance or  
24 coalition with like-minded governments of foreign coun-  
25 tries—

1           (1) to cooperate on approaches to innovation  
2           and advancements in artificial intelligence and eco-  
3           systems for artificial intelligence;

4           (2) to coordinate on development and use of  
5           interoperable international standards or harmoni-  
6           zation of standards with respect to artificial intel-  
7           ligence;

8           (3) to promote adoption of common artificial in-  
9           telligence standards;

10          (4) to develop the government-to-government  
11          infrastructure needed to facilitate coordination of co-  
12          herent global application of artificial intelligence  
13          safety standards, including, where appropriate, put-  
14          ting in place agreements for information sharing be-  
15          tween governments; and

16          (5) to involve private-sector stakeholders from  
17          partner countries to help inform coalition partners  
18          on recent developments in artificial intelligence and  
19          associated standards development.

20          (b) CRITERIA FOR PARTICIPATION.—In forming an  
21          alliance or coalition of like-minded governments of foreign  
22          countries under subsection (a), the Secretary of Com-  
23          merce, the Secretary of State, and the Director, in con-  
24          sultation with the heads of relevant agencies, shall jointly  
25          establish technology trust criteria—

1           (1) to ensure all participating countries that  
2           have a high level of scientific and technological ad-  
3           vancement;

4           (2) to ensure all participating countries commit  
5           to using open international standards; and

6           (3) to support the governance principles for  
7           international standards as detailed in the World  
8           Trade Organization Agreement on Technical Bar-  
9           riers to Trade, done at Geneva April 12, 1979, on  
10          international standards, such as transparency, open-  
11          ness, and consensus-based decision-making.

12          (c) CONSULTATION ON INNOVATION AND ADVANCE-  
13          MENTS IN ARTIFICIAL INTELLIGENCE.—In forming an al-  
14          liance or coalition under subsection (a), the Director, the  
15          Secretary of Commerce, and the Secretary of State shall  
16          consult with the Secretary of Energy and the Director of  
17          the National Science Foundation on approaches to innova-  
18          tion and advancements in artificial intelligence.

19          (d) SECURITY AND PROTECTION OF INTELLECTUAL  
20          PROPERTY.—The Director, the Secretary of Commerce,  
21          and the Secretary of State shall jointly ensure that an alli-  
22          ance or coalition formed under subsection (a) is only  
23          formed with countries that—

24                 (1) have in place sufficient intellectual property  
25                 protections, safety standards, and risk management

1 approaches relevant to innovation and artificial intel-  
2 ligence; and

3 (2) develop and coordinate research security  
4 measures, export controls, and intellectual property  
5 protections relevant to innovation, development, and  
6 standard-setting relating to artificial intelligence.

7 (e) RULE OF CONSTRUCTION.—Nothing in this sec-  
8 tion shall be construed to prohibit anyone from partici-  
9 pating in other international standards bodies.

10 **SEC. 112. REQUIREMENT TO SUPPORT BILATERAL AND**  
11 **MULTILATERAL ARTIFICIAL INTELLIGENCE**  
12 **RESEARCH COLLABORATIONS.**

13 (a) IN GENERAL.—The Director of the National  
14 Science Foundation shall support bilateral and multilat-  
15 eral collaborations to facilitate innovation in research and  
16 development of artificial intelligence.

17 (b) ALIGNMENT WITH PRIORITIES.—The Director  
18 shall ensure that collaborations supported under sub-  
19 section (a) align with the priorities of the Foundation and  
20 United States research community and have the potential  
21 to benefit United States prosperity, security, health, and  
22 well-being.

23 (c) REQUIREMENTS.—The Director shall ensure that  
24 collaborations supported under subsection (a)—

1           (1) support innovation and advancement in re-  
2           search on the development and use of artificial intel-  
3           ligence;

4           (2) facilitate international collaboration on in-  
5           novation and advancement in artificial intelligence  
6           research and development, including data sharing,  
7           expertise, and resources; and

8           (3) leverage existing National Science Founda-  
9           tion programs, such as the National Science Foun-  
10          dation-supported National Artificial Intelligence Re-  
11          search Institutes and Global Centers programs.

12          (d) COORDINATION OF SECURITY MEASURES AND  
13          EXPORT CONTROLS.—When entering into agreements in  
14          order to support collaborations pursuant to subsection (a),  
15          the Director shall ensure that participating countries have  
16          developed and coordinated security measures and export  
17          controls to protect intellectual property and research and  
18          development.

1 **Subtitle C—Identifying Regulatory**  
2 **Barriers to Innovation**

3 **SEC. 121. COMPTROLLER GENERAL OF THE UNITED**  
4 **STATES IDENTIFICATION OF RISKS AND OB-**  
5 **STACLES RELATING TO ARTIFICIAL INTEL-**  
6 **LIGENCE AND FEDERAL AGENCIES.**

7 (a) REPORT REQUIRED.—Not later than 1 year after  
8 the date of the enactment of this Act, the Comptroller  
9 General of the United States shall submit to Congress a  
10 report on regulatory impediments to innovation in artifi-  
11 cial intelligence systems.

12 (b) CONTENTS.—The report submitted pursuant to  
13 subsection (a) shall include the following:

14 (1) Significant examples of Federal statutes  
15 and regulations that directly affect the innovation of  
16 artificial intelligence systems, including the ability of  
17 companies of all sizes to compete in artificial intel-  
18 ligence, which should also account for the effect of  
19 voluntary standards and best practices developed by  
20 the Federal Government.

21 (2) An assessment of challenges that Federal  
22 agencies face in the enforcement of provisions of law  
23 identified pursuant to paragraph (1).

24 (3) An evaluation of the progress in government  
25 adoption of artificial intelligence and use of artificial

1 intelligence to improve the quality of government  
2 services.

3 (4) Based on the findings of the Comptroller  
4 General with respect to paragraphs (1) through (4),  
5 such recommendations as the Comptroller General  
6 may have for legislative or administrative action to  
7 increase the rate of innovation in artificial intel-  
8 ligence systems.

9 **TITLE II—ARTIFICIAL INTEL-**  
10 **LIGENCE RESEARCH, DEVEL-**  
11 **OPMENT, CAPACITY BUILD-**  
12 **ING ACTIVITIES**

13 **SEC. 201. PUBLIC DATA FOR ARTIFICIAL INTELLIGENCE**  
14 **SYSTEMS.**

15 (a) LIST OF PRIORITIES.—

16 (1) IN GENERAL.—To expedite the development  
17 of artificial intelligence systems in the United  
18 States, the Director of the Office of Science and  
19 Technology Policy shall, acting through the National  
20 Science and Technology Council and the Interagency  
21 Committee established or designated pursuant to  
22 section 5103 of the National Artificial Intelligence  
23 Initiative Act of 2020 (15 U.S.C. 9413), develop a  
24 list of priorities for Federal investment in creating  
25 or improving curated, publicly available Federal Gov-

1 ernment data for training and evaluating artificial  
2 intelligence systems.

3 (2) REQUIREMENTS.—

4 (A) IN GENERAL.—The list developed pur-  
5 suant to paragraph (1) shall—

6 (i) prioritize data that will advance  
7 novel artificial intelligence systems in the  
8 public interest; and

9 (ii) prioritize datasets unlikely to inde-  
10 pendently receive sufficient private sector  
11 support to enable their creation, absent  
12 Federal funding.

13 (B) DATASETS IDENTIFIED.—In carrying  
14 out subparagraph (A)(ii), the Director shall  
15 identify 20 datasets to be prioritized.

16 (3) CONSIDERATIONS.—In developing the list  
17 under paragraph (1), the Director shall consider the  
18 following:

19 (A) Applicability to the initial list of soci-  
20 etal, national, and geostrategic challenges set  
21 forth by subsection (b) of section 10387 of the  
22 Research and Development, Competition, and  
23 Innovation Act (42 U.S.C. 19107), or any suc-  
24 cessor list.

1           (B) Applicability to the initial list of key  
2           technology focus areas set forth by subsection  
3           (c) of such section, or any successor list.

4           (C) Applicability to other major United  
5           States economic sectors, such as agriculture,  
6           health care, transportation, manufacturing,  
7           communications, weather services, and positive  
8           utility to small and medium United States busi-  
9           nesses.

10          (D) Opportunities to improve datasets in  
11          effect before the date of the enactment of this  
12          Act.

13          (E) Inclusion of data representative of the  
14          entire population of the United States.

15          (F) Potential national security threats to  
16          releasing datasets, consistent with the United  
17          States Government approach to data flows.

18          (G) Requirements of laws in effect.

19          (H) Applicability to the priorities listed in  
20          the National Artificial Intelligence Research  
21          and Development Strategic Plan of the Na-  
22          tional Science and Technology Council, dated  
23          October 2016.

24          (I) Ability to use data already made avail-  
25          able to the National Artificial Intelligence Re-

1 search Resource Pilot program or any successor  
2 program.

3 (4) PUBLIC INPUT.—Before finalizing the list  
4 required by paragraph (1), the Director shall imple-  
5 ment public comment procedures for receiving input  
6 and comment from private industry, academia, civil  
7 society, and other relevant stakeholders.

8 (b) NATIONAL SCIENCE AND TECHNOLOGY COUNCIL  
9 AGENCIES.—The head of each agency with a representa-  
10 tive included in the Interagency Committee pursuant to  
11 section 5103(c) of the National Artificial Intelligence Ini-  
12 tiative Act of 2020 (15 U.S.C. 9413(c)) or the heads of  
13 multiple agencies with a representative included in the  
14 Interagency Committee working cooperatively, consistent  
15 with the missions or responsibilities of each Executive  
16 agency—

17 (1) subject to the availability of appropriations,  
18 shall award grants or otherwise establish incentives,  
19 through new or existing programs, for the creation  
20 or improvement of curated datasets identified in the  
21 list developed pursuant to subsection (a)(1), includ-  
22 ing methods for addressing data scarcity;

23 (2) may establish or leverage existing initia-  
24 tives, including public-private partnerships, to en-

1 courage private sector cost-sharing in the creation or  
2 improvement of such datasets;

3 (3) may apply the priorities set forth in the list  
4 developed pursuant to subsection (a)(1) to the enact-  
5 ment of Federal public access and open government  
6 data policies;

7 (4) in carrying out this subsection, shall ensure  
8 consistency with Federal provisions of law relating  
9 to privacy, including the technology and privacy  
10 standards applied to the National Secure Data Serv-  
11 ice under section 10375(f) of the Research and De-  
12 velopment, Competition, and Innovation Act (42  
13 U.S.C. 19085(f)); and

14 (5) in carrying out this subsection, shall ensure  
15 data sharing is limited with any country that the  
16 Secretary of Commerce, in consultation with the  
17 Secretary of Defense, the Secretary of State, and  
18 the Director of National Intelligence, determines to  
19 be engaged in conduct that is detrimental to the na-  
20 tional security or foreign policy of the United States.

21 (c) AVAILABILITY OF DATASETS.—Datasets that are  
22 created or improved by Federal agencies may be made  
23 available to the National Artificial Intelligence Research  
24 Resource pilot program established by the Director of the  
25 National Science Foundation in accordance with Executive

1 Order 14110 (88 Fed. Reg. 75191; relating to safe, se-  
2 cure, and trustworthy development and use of artificial in-  
3 telligence), or any successor program.

4 (d) **RULE OF CONSTRUCTION.**—Nothing in this sub-  
5 section shall be construed to require the Federal Govern-  
6 ment or other contributors to disclose any information—

7 (1) relating to a trade secret or other protected  
8 intellectual property right;

9 (2) that is confidential business information; or

10 (3) that is privileged.

11 **SEC. 202. FEDERAL GRAND CHALLENGES IN ARTIFICIAL IN-**  
12 **TELLIGENCE.**

13 (a) **LIST OF PRIORITIES FOR FEDERAL GRAND**  
14 **CHALLENGES IN ARTIFICIAL INTELLIGENCE.**—

15 (1) **LIST REQUIRED.**—Not later than 1 year  
16 after the date of the enactment of this Act, the Di-  
17 rector of the Office of Science and Technology Policy  
18 shall, acting through the National Science and Tech-  
19 nology Council and the Interagency Committee es-  
20 tablished or designated pursuant to section 5103 of  
21 the National Artificial Intelligence Initiative Act of  
22 2020 (15 U.S.C. 9413), in consultation with indus-  
23 try, civil society, and academia, establish a list of  
24 priorities for Federal grand challenges in artificial  
25 intelligence that seek—

1 (A) to expedite the development of artificial  
2 intelligence systems in the United States;  
3 and

4 (B) to stimulate artificial intelligence re-  
5 search, development, and commercialization  
6 that solves or advances specific, well-defined,  
7 and measurable challenges.

8 (2) CONTENTS.—The list established pursuant  
9 to paragraph (1) may include the following prior-  
10 ities:

11 (A) To overcome challenges with engineer-  
12 ing of and applied research on microelectronics,  
13 including through integration of artificial intel-  
14 ligence with emerging technologies, such as ma-  
15 chine learning and quantum computing, or with  
16 respect to the physical limits on transistors,  
17 electrical interconnects, and memory elements.

18 (B) To promote transformational or long-  
19 term advancements in computing and artificial  
20 intelligence technologies through—

- 21 (i) next-generation algorithm design;  
22 (ii) next-generation compute capa-  
23 bility;  
24 (iii) generative and adaptive artificial  
25 intelligence for design applications;

1 (iv) photonics-based microprocessors  
2 and optical communication networks, in-  
3 cluding electrophotonics;

4 (v) the chemistry and physics of new  
5 materials;

6 (vi) energy use or energy efficiency;

7 (vii) techniques to establish cryp-  
8 tographically secure content provenance in-  
9 formation; or

10 (viii) safety and controls for artificial  
11 intelligence applications.

12 (C) To develop artificial intelligence solu-  
13 tions, including through integration among  
14 emerging technologies such as quantum com-  
15 puting and machine learning, to overcome bar-  
16 riers relating to innovations in advanced manu-  
17 facturing in the United States, including areas  
18 such as—

19 (i) materials, nanomaterials, and com-  
20 posites;

21 (ii) rapid, complex design;

22 (iii) sustainability and environmental  
23 impact of manufacturing operations;

24 (iv) predictive maintenance of machin-  
25 ery;

- 1 (v) improved part quality;
- 2 (vi) process inspections;
- 3 (vii) worker safety; and
- 4 (viii) robotics.

5 (D) To develop artificial intelligence solu-  
6 tions in sectors of the economy, such as expand-  
7 ing the use of artificial intelligence in maritime  
8 vessels, including in navigation and in the de-  
9 sign of propulsion systems and fuels.

10 (E) To develop artificial intelligence solu-  
11 tions to improve border security, including solu-  
12 tions relevant to the detection of fentanyl, illicit  
13 contraband, and other illegal activities.

14 (3) PERIODIC UPDATES.—The Director shall  
15 update the list established pursuant to paragraph  
16 (1) periodically as the Director determines nec-  
17 essary.

18 (b) FEDERAL INVESTMENT INITIATIVES RE-  
19 QUIRED.—Subject to the availability of appropriations, the  
20 head of each agency with a representative on the Inter-  
21 agency Committee pursuant to section 5103(c) of the Na-  
22 tional Artificial Intelligence Initiative Act of 2020 (15  
23 U.S.C. 9413(c)) or the heads of multiple agencies with a  
24 representative on the Interagency Committee working co-  
25 operatively, shall, consistent with the missions or respon-

1 sibilities of each agency, establish 1 or more prize competi-  
2 tions under section 24 of the Stevenson-Wydler Tech-  
3 nology Innovation Act of 1980 (15 U.S.C. 3719), chal-  
4 lenge-based acquisitions, or other research and develop-  
5 ment investments that each agency head deems appro-  
6 priate consistent with the list of priorities established pur-  
7 suant to subsection (a)(1).

8 (c) TIMING AND ANNOUNCEMENTS OF FEDERAL IN-  
9 VESTMENT INITIATIVES.—The President, acting through  
10 the Director, shall ensure that, not later than 1 year after  
11 the date on which the Director establishes the list required  
12 by subsection (a)(1), at least 3 prize competitions, chal-  
13 lenge-based acquisitions, or other research and develop-  
14 ment investments are announced by heads of Federal  
15 agencies under subsection (b).

16 (d) REQUIREMENTS.—Each head of an agency car-  
17 rying out an investment initiative under subsection (b)  
18 shall ensure that—

19 (1) for each prize competition or investment ini-  
20 tiative carried out by the agency under such sub-  
21 section, there is—

22 (A) a positive impact on the economic com-  
23 petitiveness of the United States;

24 (B) a benefit to United States industry;

1           (C) to the extent possible, leveraging of the  
2           resources and expertise of industry and philan-  
3           thropic partners in shaping the investments;  
4           and

5           (D) in a case involving development and  
6           manufacturing, use of advanced manufacturing  
7           in the United States; and

8           (2) all research conducted for purposes of the  
9           investment initiative is conducted in the United  
10          States.

○