

116TH CONGRESS
1ST SESSION

S. 403

To encourage the research and use of innovative materials and associated techniques in the construction and preservation of the domestic transportation and water infrastructure system, and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 7, 2019

Mr. WHITEHOUSE (for himself, Mr. ALEXANDER, Ms. COLLINS, Ms. SMITH, Mr. ROUNDS, and Mr. BOOKER) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To encourage the research and use of innovative materials and associated techniques in the construction and preservation of the domestic transportation and water infrastructure system, 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.**

4 This Act may be cited as the “Innovative Materials
5 for America’s Growth and Infrastructure Newly Expanded
6 Act of 2019” or the “IMAGINE Act”.

1 **SEC. 2. PURPOSES.**

2 The purposes of this Act are—

3 (1) to encourage the research and use of inno-
4 vative materials, in concert with traditional mate-
5 rials, and associated techniques in the construction
6 and preservation of the domestic infrastructure net-
7 work;

8 (2) to accelerate the deployment and extend the
9 service life, improve the performance, and reduce the
10 cost of infrastructure projects; and

11 (3) to improve the economy, resilience, main-
12 tainability, sustainability, and safety of the domestic
13 infrastructure network.

14 **SEC. 3. DEFINITION OF INNOVATIVE MATERIAL.**

15 In this Act, the term “innovative material”, with re-
16 spect to an infrastructure project, includes high perform-
17 ance asphalt mixtures and concrete formulations,
18 geosynthetic materials, advanced insulating materials, ad-
19 vanced alloys and metals, reinforced polymer composites,
20 advanced polymers, nanocellulose and wood-based compos-
21 ites, coatings, highly functional adhesives, or other corro-
22 sion prevention methods used in conjunction with those
23 materials, and any other material or aggregate materials,
24 as determined by the appropriate agency or department
25 head.

1 **SEC. 4. INTERAGENCY INNOVATIVE MATERIALS STAND-**
2 **ARDS TASK FORCE.**

3 (a) ESTABLISHMENT.—

4 (1) IN GENERAL.—Not later than 180 days
5 after the date of enactment of this Act, the Director
6 of the National Institute of Standards and Tech-
7 nology shall establish an Interagency Innovative Ma-
8 terials Standards Task Force (referred to in this
9 section as the “Task Force”) composed of the heads
10 of Federal agencies responsible for significant civil
11 infrastructure projects, including—

12 (A) the Administrator of the Federal High-
13 way Administration;

14 (B) the Commanding General and Chief of
15 Engineers of the Corps of Engineers;

16 (C) the Assistant Secretary of the Army
17 for Civil Works; and

18 (D) the Administrator of the Environ-
19 mental Protection Agency.

20 (2) CHAIRPERSON.—The Director of the Na-
21 tional Institute of Standards and Technology shall
22 serve as Chairperson of the Task Force.

23 (b) PURPOSE.—The Task Force shall coordinate and
24 improve, with respect to infrastructure construction, retro-
25 fitting, rehabilitation, and other improvements—

26 (1) Federal testing standards;

- 1 (2) Federal design and use guidelines;
2 (3) Federal regulations; and
3 (4) other applicable standards.

4 (c) REPORT.—

5 (1) IN GENERAL.—Not later than 18 months
6 after the date of enactment of this Act, the Task
7 Force shall conduct, and submit to the appropriate
8 committees of Congress a report that describes the
9 results of, a study—

10 (A) to assess the standards for the use of
11 innovative materials in infrastructure projects;

12 (B) to identify any barriers, regulatory or
13 otherwise, relating to the standards described in
14 subparagraph (A) that preclude the use of cer-
15 tain products or associated techniques; and

16 (C) to identify opportunities for the devel-
17 opment of standardized designs that use inno-
18 vative materials to reduce costs, improve per-
19 formance, and extend the service life of infra-
20 structure assets.

21 (2) REPORT.—The report under paragraph (1)
22 shall—

23 (A) identify any non-Federal entities or
24 other organizations, including the American As-

1 society of State Highway and Transportation
2 Officials, that develop relevant standards; and

3 (B) outline a strategy to improve coordina-
4 tion and information sharing between the enti-
5 ties described in subparagraph (A) and any rel-
6 evant Federal agencies.

7 (d) IMPROVED COORDINATION.—Not later than 2
8 years after the date of enactment of this Act, the Task
9 Force shall collaborate with any non-Federal entity identi-
10 fied under subsection (c)(2)(A)—

11 (1) to identify and carry out appropriate re-
12 search, testing methods, and processes relating to
13 the development and use of innovative materials;

14 (2) to develop new methods and processes relat-
15 ing to the development and use of innovative mate-
16 rials, as the applicable agency head determines to be
17 necessary;

18 (3) to contribute to the development of stand-
19 ards and guidelines for the use of innovative mate-
20 rials and approaches in civil infrastructure projects;

21 (4) to develop a plan for addressing potential
22 barriers, regulatory or otherwise, identified in sub-
23 section (c)(1)(B); and

24 (5) to develop a plan for the development of
25 standardized designs that use innovative materials to

1 reduce costs, improve performance, and extend the
2 service life of infrastructure assets.

3 **SEC. 5. INNOVATIVE MATERIAL INNOVATION HUBS.**

4 (a) DEFINITIONS.—In this section:

5 (1) HUB.—The term “Hub” means an Innova-
6 tive Material Innovation Hub established under this
7 section.

8 (2) QUALIFYING ENTITY.—The term “quali-
9 fying entity” means—

10 (A) an institution of higher education (as
11 defined in section 101(a) of the Higher Edu-
12 cation Act of 1965 (20 U.S.C. 1001(a)));

13 (B) an appropriate Federal or State entity,
14 including a federally funded research and devel-
15 opment center of the Department of Transpor-
16 tation;

17 (C) a university transportation center
18 under section 5505 of title 49, United States
19 Code;

20 (D) an Innovative Material Innovation
21 Hub in existence on the date of enactment of
22 this Act; and

23 (E) any other relevant entity the Secretary
24 determines to be appropriate.

1 (3) SECRETARY.—The term “Secretary” means
2 the Secretary of Transportation.

3 (b) AUTHORIZATION OF PROGRAM.—

4 (1) IN GENERAL.—The Secretary shall carry
5 out a program to enhance the development of inno-
6 vative materials in the United States by making
7 awards to consortia for establishing and operating
8 new Hubs, to be known as “Innovative Material In-
9 novation Hubs”, to conduct and support multidisci-
10 plinary, collaborative research, development, dem-
11 onstration, standardized design development, and
12 commercial application of innovative materials.

13 (2) LOCATION OF HUBS.—To the extent prac-
14 ticable, each Hub shall be located at 1 centralized lo-
15 cation.

16 (3) TECHNOLOGY DEVELOPMENT FOCUS.—The
17 Secretary shall designate for each new Hub a unique
18 innovative material focus, such as material develop-
19 ment, infrastructure applications, and other focus
20 areas identified by the Secretary.

21 (4) COORDINATION.—The Secretary shall en-
22 sure the coordination of, and avoid unnecessary du-
23 plication of, the activities of each Hub with the ac-
24 tivities of—

1 (A) other research entities of the Depart-
2 ment of Transportation, including the Federal
3 Highway Administration;

4 (B) the National Laboratories (as defined
5 in section 2 of the Energy Policy Act of 2005
6 (42 U.S.C. 15801));

7 (C) the Corps of Engineers;

8 (D) the Environmental Protection Agency;

9 (E) the Federal Emergency Management
10 Agency;

11 (F) the National Institute of Standards
12 and Technology;

13 (G) the Department of Defense;

14 (H) an industry consortium meeting the
15 requirements under subsection (c)(1); and

16 (I) any other Federal agencies or industry
17 consortia conducting substantially similar work.

18 (c) APPLICATION PROCESS.—

19 (1) ELIGIBILITY.—To be eligible to receive an
20 award for the establishment and operation of a Hub
21 under subsection (b)(1), a consortium shall—

22 (A) be composed of not fewer than 2 quali-
23 fying entities;

1 (B) operate subject to a binding agree-
2 ment, entered into by each member of the con-
3 sortium, that documents—

4 (i) the proposed partnership agree-
5 ment, including the governance and man-
6 agement structure of the Hub;

7 (ii) measures the consortium will un-
8 dertake to enable cost-effective implemen-
9 tation of activities under the program de-
10 scribed in subsection (b)(1); and

11 (iii) a proposed budget, including fi-
12 nancial contributions from non-Federal
13 sources; and

14 (C) operate as a nonprofit organization.

15 (2) APPLICATION.—

16 (A) IN GENERAL.—A consortium seeking
17 to establish and operate a Hub under sub-
18 section (b)(1) shall submit to the Secretary an
19 application at such time, in such manner, and
20 containing such information as the Secretary
21 may require, including a detailed description
22 of—

23 (i) each element of the consortium
24 agreement required under paragraph
25 (1)(B); and

1 (ii) any existing facilities the consor-
2 tium intends to provide for Hub activities.

3 (B) REQUIREMENT.—If the consortium
4 members will not be located at 1 centralized lo-
5 cation, the application under subparagraph (A)
6 shall include a communications plan that en-
7 sures close coordination and integration of Hub
8 activities.

9 (3) SELECTION.—

10 (A) IN GENERAL.—The Secretary shall se-
11 lect consortia for awards for the establishment
12 and operation of Hubs through a competitive
13 selection process.

14 (B) CONSIDERATIONS.—In selecting con-
15 sortia under subparagraph (A), the Secretary
16 shall consider—

17 (i) the information disclosed by the
18 consortium under this subsection;

19 (ii) any existing facilities a consortium
20 will provide for Hub activities; and

21 (iii) maintaining regional variety in lo-
22 cations of selected Hubs.

23 (d) TERM.—An award made to a Hub under this sec-
24 tion shall be for a period of not more than 5 years, subject

1 to the availability of appropriations, after which the award
2 may be renewed, subject to a rigorous merit review.

3 (e) HUB OPERATIONS.—

4 (1) IN GENERAL.—Each Hub shall conduct or
5 provide for multidisciplinary, collaborative research,
6 development, demonstration, and commercial appli-
7 cation of innovative materials within the technology
8 development focus designated under subsection
9 (b)(3).

10 (2) ACTIVITIES.—Each Hub shall—

11 (A) encourage collaboration and commu-
12 nication among the member qualifying entities
13 of the consortium as described in subsection
14 (c)(1) and awardees;

15 (B) develop and publish proposed plans
16 and programs on a publicly accessible website;

17 (C) submit to the Department of Trans-
18 portation an annual report summarizing the ac-
19 tivities of the Hub, including information—

20 (i) detailing organizational expendi-
21 tures; and

22 (ii) describing each project under-
23 taken by the Hub; and

24 (D) monitor project implementation and
25 coordination.

1 (3) CONFLICTS OF INTEREST.—Each Hub shall
2 maintain conflict of interest procedures, consistent
3 with the conflict of interest procedures of the De-
4 partment of Transportation.

5 (4) PROHIBITION ON CONSTRUCTION.—

6 (A) IN GENERAL.—Except as provided in
7 subparagraph (B)—

8 (i) no funds provided under this sec-
9 tion may be used for construction of new
10 buildings or facilities for Hubs; and

11 (ii) construction of new buildings or
12 facilities shall not be considered as part of
13 the non-Federal share of a Hub cost-shar-
14 ing agreement.

15 (B) TEST BED AND RENOVATION EXCEP-
16 TION.—Nothing in this paragraph prohibits the
17 use of funds provided under this section or non-
18 Federal cost share funds for the construction of
19 a test bed or renovations to existing buildings
20 or facilities for the purposes of research if the
21 Secretary determines that the test bed or ren-
22 ovations are limited to a scope and scale nec-
23 essary for the research to be conducted.

1 **SEC. 6. TURNER-FAIRBANK HIGHWAY RESEARCH CENTER.**

2 Section 503(b)(7) of title 23, United States Code, is
3 amended by adding at the end the following:

4 “(C) INNOVATIVE MATERIALS.—

5 “(i) DEFINITION OF INNOVATIVE MA-
6 TERIAL.—In this subparagraph, the term
7 ‘innovative material’, with respect to an in-
8 frastructure project, includes high perform-
9 ance asphalt mixtures and concrete formu-
10 lations, geosynthetic materials, advanced
11 insulating materials, advanced alloys and
12 metals, reinforced polymer composites, ad-
13 vanced polymers, nanocellulose and wood-
14 based composites, coatings, highly func-
15 tional adhesives, or other corrosion preven-
16 tion methods used in conjunction with
17 those materials, and any other material or
18 aggregate materials, as determined by the
19 appropriate agency or department head.

20 “(ii) COLLABORATION WITH STATES
21 AND TRIBES.—The Secretary shall expand
22 the capacity of the Turner-Fairbank High-
23 way Research Center to collaborate with
24 relevant State and Tribal agencies—

25 “(I) with respect to the use of in-
26 novative materials in construction

1 projects carried out by the State and
2 Tribal agencies; and

3 “(II) to understand and iden-
4 tify—

5 “(aa) the needs of the State
6 and Tribal agencies; and

7 “(bb) innovative materials
8 that may be further researched,
9 developed, and used to meet
10 those needs.

11 “(iii) ACTIVITIES.—The collaboration
12 described in clause (ii) may include—

13 “(I) the development of new
14 training for State and Tribal agencies;
15 and

16 “(II) the expansion of technical
17 training that involves State or Tribal
18 departments of transportation in the
19 development of new construction de-
20 signs for innovative materials at the
21 Turner-Fairbank Highway Research
22 Center.

23 “(iv) PRIORITY RESEARCH.—The Tur-
24 ner-Fairbank Highway Research Center
25 shall prioritize research relating to—

1 “(I) the use of innovative mate-
2 rials in—

3 “(aa) bridges with a span
4 equal to or greater than 50 feet;

5 “(bb) highway reconstruc-
6 tion and rehabilitation; and

7 “(cc) rural road infrastruc-
8 ture;

9 “(II) the development of stand-
10 ardized designs using innovative mate-
11 rials; and

12 “(III) coastal resiliency.

13 “(v) AUTHORIZATION OF APPROPRIA-
14 TIONS.—There is authorized to be appro-
15 priated to carry out this subparagraph
16 \$8,000,000 for each of fiscal years 2020
17 through 2024.”.

18 **SEC. 7. INNOVATIVE BRIDGE PROGRAM.**

19 (a) DEFINITION OF ADMINISTRATOR.—In this sec-
20 tion, the term “Administrator” means the Administrator
21 of the Federal Highway Administration.

22 (b) ESTABLISHMENT.—The Administrator shall es-
23 tablish a grant program, to be known as the “Innovative
24 Bridge Program”, to provide grants to State departments
25 of transportation, Tribal governments, or units of local

1 government for coastal and rural infrastructure bridge
2 projects.

3 (c) APPLICATIONS.—To be eligible to receive a grant
4 under subsection (b), a State department of transpor-
5 tation or unit of Tribal or local government shall submit
6 to the Administrator an application at such time, in such
7 manner, and containing such information as the Adminis-
8 trator may require.

9 (d) ELIGIBLE PROJECTS.—To be eligible to receive
10 a grant under subsection (b) or (g), a coastal or rural in-
11 frastructure bridge project or a value engineering project
12 shall—

13 (1) be for the purpose of construction, preserva-
14 tion, rehabilitation, or reconstruction of a bridge
15 with a span equal to or greater than 50 feet;

16 (2) be carried out in a manner so as to reduce
17 traffic impact;

18 (3) use innovative materials that—

19 (A) are resistant to corrosion; and

20 (B) extend the service life of the bridge;

21 and

22 (4) reduce preservation costs, as compared to
23 conventionally designed and constructed bridges.

1 (e) PREFERENCES.—In providing grants under this
2 section, the Administrator shall give preference to pro-
3 posed projects that—

4 (1) use materials that are domestically pro-
5 duced and sourced;

6 (2) use nontraditional production techniques,
7 such as factory prefabrication; and

8 (3) retrofit a bridge.

9 (f) SPECIAL CONSIDERATION FOR AT-RISK AREAS.—
10 In providing grants under this section, the Administrator
11 shall give special consideration to projects located in rural
12 areas or areas prone to coastal or inland flooding due to
13 severe storms (such as hurricanes or rain bursts), storm
14 surges, or projected sea level rise during the projected life-
15 time of the project.

16 (g) VALUE ENGINEERING USING INNOVATIVE MATE-
17 RIALS.—Of the amounts made available to carry out this
18 section, the Administrator shall set aside \$10,000,000 for
19 each of fiscal years 2020 through 2024 to provide funding
20 to 1 or more State departments of transportation or units
21 of Tribal or local government that submit to the Adminis-
22 trator an application to carry out value engineering of a
23 standard bridge design to enhance the performance of the
24 bridge (including extending the service life of the bridge,
25 increasing resistance to corrosion, and reducing construc-

1 tion and preservation costs) through the use of innovative
2 materials.

3 (h) RECORDKEEPING; REPORTS.—

4 (1) RECORDKEEPING.—Not later than 1 year
5 after the date of enactment of this Act, the Adminis-
6 trator shall develop a project recordkeeping system
7 that maintains comprehensive, current, and accurate
8 information on each grant provided under this sec-
9 tion.

10 (2) REPORTS.—Not later than 2 years after the
11 development of the recordkeeping system described
12 in paragraph (1), and every 2 years thereafter, the
13 Administrator shall submit to the appropriate com-
14 mittees of Congress, including the Committee on
15 Environment and Public Works of the Senate, and
16 make publicly available a report describing, with re-
17 spect to each project that receives a grant under this
18 section—

19 (A) the status of the project;

20 (B) the location of the project;

21 (C) for each bridge in the project, the in-
22 ventory number of the bridge in the National
23 Bridge Inventory pursuant to section 144 of
24 title 23, United States Code;

1 (D) a detailed description of the scope of
2 the project;

3 (E) the amount of project costs paid by
4 funds provided under this section and the total
5 project costs;

6 (F) for each bridge involved in the project,
7 the bridge condition, operations, and perform-
8 ance of the bridge; and

9 (G) in every third report submitted under
10 this paragraph, the results of the regular moni-
11 toring and evaluation of the maintenance de-
12 mands, projects, needs, and costs of each bridge
13 in the project during the previous 6 years.

14 (i) AUTHORIZATION OF APPROPRIATIONS.—There is
15 authorized to be appropriated to the Administrator to
16 carry out this section \$65,000,000 for each of fiscal years
17 2020 through 2024.

18 **SEC. 8. WATER INFRASTRUCTURE INNOVATION PROGRAM.**

19 (a) ESTABLISHMENT.—The Administrator of the En-
20 vironmental Protection Agency (referred to in this section
21 as the “Administrator”) shall establish a grant program,
22 to be known as the “Water Infrastructure Innovation Pro-
23 gram”, to provide grants for the design and installation
24 of water infrastructure projects, including wastewater
25 transport and treatment systems and drinking water

1 treatment and distribution systems, that use innovative
2 materials to reduce total costs, including operation and
3 preservation expenses, and extend the service life of in-
4 stalled structures.

5 (b) APPLICATIONS.—To be eligible to receive a grant
6 under this section, an applicant shall submit to the Admin-
7 istrator an application at such time, in such manner, and
8 containing such information as the Administrator may re-
9 quire.

10 (c) ELIGIBLE PROJECTS.—To be eligible to receive
11 a grant under this section, a water infrastructure project
12 shall—

13 (1) serve a community with a population be-
14 tween 3,301 and 99,999; and

15 (2) use innovative materials that—

16 (A) are resistant to degradation;

17 (B) extend service life; or

18 (C) provide long-term protection of water
19 facilities and systems.

20 (d) PREFERENCE.—In providing grants under this
21 section, the Administrator shall give preference to pro-
22 posed projects that use materials that are domestically
23 produced and sourced.

24 (e) SPECIAL CONSIDERATION FOR AT-RISK
25 AREAS.—In providing grants under this section, the Ad-

1 administrator shall give special consideration to projects lo-
2 cated in areas that are prone to saltwater intrusion or
3 flooding due to severe storms, rain bursts, storm surges,
4 or projected sea level rise during the projected lifetime of
5 the project.

6 (f) RECORDKEEPING; REPORTS.—

7 (1) RECORDKEEPING.—Not later than 1 year
8 after the date of enactment of this Act, the Adminis-
9 trator shall develop a project recordkeeping system
10 that maintains comprehensive, current, and accurate
11 information on each grant provided under this sec-
12 tion.

13 (2) REPORTS.—Not later than 2 years after the
14 development of the recordkeeping system described
15 in paragraph (1), and every 2 years thereafter, the
16 Administrator shall submit to the appropriate com-
17 mittees of Congress, including the Committee on
18 Environment and Public Works of the Senate, and
19 make publicly available a report describing, with re-
20 spect to each project that receives a grant under this
21 section—

22 (A) the status of the project;

23 (B) the location of the project;

24 (C) a detailed description of the scope of
25 the project;

1 (D) the amount of project costs paid by
2 funds provided under this section and the total
3 project costs;

4 (E) the condition, operations, and perform-
5 ance of the project; and

6 (F) in every third report submitted under
7 this paragraph, the results of the regular moni-
8 toring and evaluation of the maintenance de-
9 mands, projects, needs, and costs of the project
10 during the previous 6 years.

11 (g) AUTHORIZATION OF APPROPRIATIONS.—There is
12 authorized to be appropriated to the Administrator to
13 carry out this section \$65,000,000 for each of fiscal years
14 2020 through 2024.

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