

117TH CONGRESS
1ST SESSION

S. 939

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

MARCH 24, 2021

Mr. WHITEHOUSE (for himself and Ms. COLLINS) 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 2021” or the “IMAGINE Act”.

7 **SEC. 2. PURPOSES.**

8 The purposes of this Act are—

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

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

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

12 **SEC. 3. INTERAGENCY INNOVATIVE MATERIALS STAND-**
 13 **ARDS TASK FORCE.**

14 (a) DEFINITION OF INNOVATIVE MATERIAL.—In this
 15 section, the term “innovative material”, with respect to
 16 an infrastructure project, includes a material, or a com-
 17 bination or process for use of materials, that, as deter-
 18 mined by the appropriate Secretary or agency head—

19 (1) enhances the overall service life, sustain-
 20 ability, and resiliency of the project; or

21 (2) provides ancillary benefits relative to widely
 22 adopted state of practice technologies.

23 (b) PURPOSES.—The purposes of this section are—

24 (1) to encourage the research, design, and use
 25 of innovative materials, in concert with traditional

1 materials, and associated techniques in the construc-
2 tion and preservation of the domestic infrastructure
3 network;

4 (2) to accelerate the deployment, extend the
5 service life, improve the performance, and reduce the
6 cost of infrastructure projects; and

7 (3) to improve the economy, resilience, main-
8 tainability, sustainability, and safety of the domestic
9 infrastructure network.

10 (c) ESTABLISHMENT.—

11 (1) IN GENERAL.—Not later than 180 days
12 after the date of enactment of this Act, the Director
13 of the National Institute of Standards and Tech-
14 nology shall establish an Interagency Innovative Ma-
15 terials Standards Task Force (referred to in this
16 section as the “Task Force”) composed of the heads
17 of Federal agencies responsible for significant civil
18 infrastructure projects, including the Administrator
19 of the Federal Highway Administration.

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

- 1 (1) Federal testing standards;
- 2 (2) Federal design and use guidelines;
- 3 (3) Federal regulations; and
- 4 (4) other applicable standards and performance
- 5 and sustainability metrics.

6 (e) REPORT.—

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

12 (A) to assess the standards and perform-
13 ance metrics for the use of innovative materials
14 in infrastructure projects;

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

19 (C) to identify opportunities for the devel-
20 opment of standardized designs and materials
21 genome approaches that design and use innova-
22 tive materials to reduce costs, improve perform-
23 ance and sustainability, and extend the service
24 life of infrastructure assets.

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

3 (A) identify any non-Federal entities or
4 other organizations, including the American As-
5 sociation of State Highway and Transportation
6 Officials, that develop relevant standards; and

7 (B) outline a strategy to improve coordina-
8 tion and information sharing between the enti-
9 ties described in subparagraph (A) and any rel-
10 evant Federal agencies.

11 (f) IMPROVED COORDINATION.—Not later than 2
12 years after the date of enactment of this Act, the Task
13 Force shall collaborate with any non-Federal entity identi-
14 fied under subsection (e)(2)(A)—

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

18 (2) to develop new methods and processes relat-
19 ing to the development and use of innovative mate-
20 rials, as the applicable agency head determines to be
21 necessary;

22 (3) to contribute to the development of stand-
23 ards, performance metrics, and guidelines for the
24 use of innovative materials and approaches in civil
25 infrastructure projects;

1 (4) to develop a plan for addressing potential
 2 barriers, regulatory or otherwise, identified in sub-
 3 section (e)(1)(B); and

4 (5) to develop a plan for the development of
 5 standardized designs that use innovative materials to
 6 reduce costs, improve performance and sustain-
 7 ability, and extend the service life of infrastructure
 8 assets.

9 **SEC. 4. INNOVATIVE MATERIAL INNOVATION HUBS.**

10 (a) DEFINITIONS.—In this section:

11 (1) HUB.—The term “Hub” means an Innova-
 12 tive Material Innovation Hub established under this
 13 section.

14 (2) INNOVATIVE MATERIAL.—The term “inno-
 15 vative material”, with respect to an infrastructure
 16 project, includes a material, or a combination or
 17 process for use of materials, that, as determined by
 18 the Secretary—

19 (A) enhances the overall service life, sus-
 20 tainability, and resiliency of the project; or

21 (B) provides ancillary benefits relative to
 22 widely adopted state of practice technologies.

23 (3) QUALIFYING ENTITY.—The term “quali-
 24 fying entity” means—

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

4 (B) an appropriate Federal or State entity,
5 including a federally-funded research and devel-
6 opment center of the Department of Transpor-
7 tation;

8 (C) a university transportation center
9 under section 5505 of title 49, United States
10 Code; and

11 (D) a research and development entity in
12 existence on the date of enactment of this Act
13 focused on innovative materials that the Sec-
14 retary determines to be similar in scope and in-
15 tent to a Hub.

16 (4) SECRETARY.—The term “Secretary” means
17 the Secretary of Transportation.

18 (b) ESTABLISHMENT.—

19 (1) IN GENERAL.—The Secretary shall carry
20 out a program to enhance the development of inno-
21 vative materials in the United States by making
22 awards to consortia for establishing and operating
23 Innovative Material Innovation Hubs to conduct and
24 support multidisciplinary, collaborative research, de-
25 velopment, demonstration, standardized design de-

1 velopment, and commercial application of innovative
2 materials.

3 (2) COORDINATION.—The Secretary shall en-
4 sure the coordination of, and avoid duplication of,
5 the activities of each Hub with the activities of—

6 (A) other research entities of the Depart-
7 ment of Transportation, including the Federal
8 Highway Administration; and

9 (B) research entities of other Federal
10 agencies, as appropriate.

11 (c) COMPETITIVE SELECTION PROCESS.—

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

15 (A) be composed of not fewer than 2 quali-
16 fying entities;

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

20 (i) the proposed partnership agree-
21 ment, including the governance and man-
22 agement structure of the Hub;

23 (ii) measures the consortium will un-
24 dertake to enable cost-effective implemen-

tation of activities under the program described in subsection (b)(1); and

(iii) a proposed budget, including financial contributions from non-Federal sources; and

(C) operate as a nonprofit organization.

(2) APPLICATION.—

(A) IN GENERAL.—A consortium seeking to establish and operate a Hub under subsection (b)(1) shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require, including a detailed description of—

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

(ii) any existing facilities the consortium intends to use for Hub activities.

(B) REQUIREMENT.—If the consortium members will not be located at 1 centralized location, the application under subparagraph (A) shall include a communications plan that ensures close coordination and integration of Hub activities.

1 (3) SELECTION.—

2 (A) IN GENERAL.—The Secretary shall se-
3 lect consortia for awards for the establishment
4 and operation of Hubs through a competitive
5 selection process.

6 (B) CONSIDERATIONS.—In selecting con-
7 sortia under subparagraph (A), the Secretary
8 shall consider—

9 (i) any existing facilities a consortium
10 has identified to be used for Hub activities;

11 (ii) maintaining geographic diversity
12 in locations of selected Hubs;

13 (iii) the demonstrated ability of the
14 recipient to conduct and support multi-
15 disciplinary, collaborative research, devel-
16 opment, demonstration, standardized de-
17 sign development, and commercial applica-
18 tion of innovative materials;

19 (iv) the demonstrated research, tech-
20 nology transfer, and education resources
21 available to the recipient to carry out this
22 section;

23 (v) the ability of the recipient to pro-
24 vide leadership in solving immediate and
25 long-range national and regional transpor-

1 tation problems related to innovative mate-
2 rials;

3 (vi) the demonstrated ability of the re-
4 cipient to disseminate results and spur the
5 implementation of transportation research
6 and education programs through national
7 or statewide continuing education pro-
8 grams;

9 (vii) the demonstrated commitment of
10 the recipient to the use of peer review prin-
11 ciples and other research best practices in
12 the selection, management, and dissemina-
13 tion of research projects;

14 (viii) the performance metrics to be
15 used in assessing the performance of the
16 recipient in meeting the stated research,
17 technology transfer, education, and out-
18 reach goals; and

19 (ix) the ability of the recipient to im-
20 plement the proposed program in a cost-ef-
21 ficient manner, including through cost
22 sharing and overall reduced overhead, fa-
23 cilities, and administrative costs.

24 (4) TRANSPARENCY.—

1 (A) IN GENERAL.—The Secretary shall
2 provide to each applicant, on request, any mate-
3 rials, including copies of reviews (with any in-
4 formation that would identify a reviewer re-
5 dacted), used in the evaluation process of the
6 proposal of the applicant.

7 (B) REPORTS.—The Secretary shall sub-
8 mit to the Committee on Transportation and
9 Infrastructure of the House of Representatives
10 and the Committee on Environment and Public
11 Works of the Senate a report that describes the
12 overall review process under paragraph (2),
13 given the considerations under paragraph
14 (3)(B), that includes—

15 (i) specific criteria of evaluation used
16 in the review;

17 (ii) descriptions of the review process;

18 and

19 (iii) explanations of the selected
20 awards.

21 (d) AUTHORIZATION OF APPROPRIATIONS.—

22 (1) IN GENERAL.—There are authorized to be
23 appropriated to carry out this section such sums as
24 are necessary.

1 (2) AVAILABILITY.—Amounts made available to
 2 carry out this section shall remain available for a pe-
 3 riod of 3 years after the last day of the fiscal year
 4 in which the amounts were made available.

5 (e) HUB OPERATIONS.—

6 (1) IN GENERAL.—Each Hub shall conduct, or
 7 provide for, multidisciplinary, collaborative research,
 8 development, demonstration, and commercial appli-
 9 cation of innovative materials.

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, as it relates to con-
 24 ducting and supporting multidisciplinary,
 25 collaborative research, development, dem-

1 onstration, standardized design develop-
 2 ment, and commercial application of inno-
 3 vative materials; and

4 (D) monitor project implementation and
 5 coordination.

6 (3) CONFLICTS OF INTEREST.—Each Hub shall
 7 maintain conflict of interest procedures, consistent
 8 with the conflict of interest procedures of the De-
 9 partment of Transportation.

10 (4) PROHIBITION ON CONSTRUCTION AND REN-
 11 OVATION.—

12 (A) IN GENERAL.—No funds provided
 13 under this section may be used for construction
 14 or renovation of new buildings, test beds, or ad-
 15 ditional facilities for Hubs.

16 (B) NON-FEDERAL SHARE.—Construction
 17 of new buildings or facilities shall not be consid-
 18 ered as part of the non-Federal share of a Hub
 19 cost-sharing agreement.

20 (f) APPLICABILITY.—The Secretary shall administer
 21 this section in accordance with section 330 of title 49,
 22 United States Code.

23 **SEC. 5. TURNER-FAIRBANK HIGHWAY RESEARCH CENTER.**

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

“(C) INNOVATIVE MATERIALS.—

“(i) DEFINITION OF INNOVATIVE MATERIAL.—In this subparagraph, the term ‘innovative material’, with respect to an infrastructure project, includes high performance asphalt mixtures and concrete formulations, geosynthetic materials, advanced insulating materials, advanced alloys and metals, reinforced polymer composites, advanced polymers, nanocellulose and wood-based composites, coatings, highly functional adhesives, or other corrosion prevention methods used in conjunction with those materials, and any other material or aggregate materials, as determined by the appropriate agency or department head.

“(ii) COLLABORATION WITH STATES AND TRIBES.—The Secretary shall expand the capacity of the Turner-Fairbank Highway Research Center to collaborate with relevant State and Tribal agencies—

“(I) with respect to the use of innovative materials in construction projects carried out by the State and Tribal agencies; and

1 “(II) to understand and iden-
2 tify—

3 “(aa) the needs of the State
4 and Tribal agencies; and

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

9 “(iii) ACTIVITIES.—The collaboration
10 described in clause (ii) may include—

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

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

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

24 “(I) the use of innovative mate-
25 rials in—

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

3 “(bb) highway reconstruc-
4 tion and rehabilitation; and

5 “(cc) rural road infrastruc-
6 ture;

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

10 “(III) coastal resiliency.

11 “(v) AUTHORIZATION OF APPROPRIA-
12 TIONS.—There is authorized to be appro-
13 priated to carry out this subparagraph
14 \$8,000,000 for each of fiscal years 2022
15 through 2026.”.

16 **SEC. 6. INNOVATIVE BRIDGE PROGRAM.**

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

20 (b) ESTABLISHMENT.—The Administrator shall es-
21 tablish a grant program, to be known as the “Innovative
22 Bridge Program”, to provide grants to State departments
23 of transportation, Tribal governments, public toll authori-
24 ties, and units of local government for—

1 (1) coastal or rural infrastructure bridge
2 projects; and

3 (2) value engineering projects under subsection
4 (g).

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

12 (d) ELIGIBLE PROJECTS.—To be eligible to receive
13 a grant under this section, a coastal or rural infrastruc-
14 ture bridge project or a value engineering project shall—

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

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

20 (3) include multimodal transportation compo-
21 nents, such as bicycle and pedestrian paths; and

22 (4) use innovative materials that—

23 (A) are resistant to corrosion; and

24 (B) extend the service life of the bridge.

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;

8 (3) include multimodal transportation compo-
9 nents, such as bicycle and pedestrian paths; and

10 (4) retrofit a bridge.

11 (f) SPECIAL CONSIDERATION FOR AT-RISK AREAS.—

12 In providing grants under this section, the Administrator
13 shall give special consideration to projects located in rural
14 areas or areas prone to coastal or inland flooding due to
15 severe storms (such as hurricanes or rain bursts), storm
16 surges, or projected sea level rise during the projected life-
17 time of the project.

18 (g) VALUE ENGINEERING USING INNOVATIVE MATE-
19 RIALS.—Of the amounts made available to carry out this
20 section, the Administrator shall set aside \$10,000,000 for
21 each of fiscal years 2022 through 2026 to provide funding
22 to 1 or more State departments of transportation or units
23 of Tribal or local government that submit to the Adminis-
24 trator an application to carry out value engineering of a
25 standard bridge design to enhance the performance of the

1 bridge (including extending the service life of the bridge,
2 increasing resistance to corrosion, and reducing construc-
3 tion and preservation costs) through the use of innovative
4 materials.

5 (h) RECORDKEEPING; REPORTS.—

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

12 (2) REPORTS.—Not later than 2 years after the
13 development of the recordkeeping system described
14 in paragraph (1), and every 2 years thereafter, the
15 Administrator shall submit to the Committee on
16 Transportation and Infrastructure of the House of
17 Representatives and the Committee on Environment
18 and Public Works of the Senate, and make publicly
19 available, a report that describes, with respect to
20 each project that receives a grant under this sec-
21 tion—

22 (A) the status of the project;

23 (B) the location of the project;

24 (C) for each bridge involved in the project,
25 the inventory number of the bridge in the Na-

1 tional Bridge Inventory pursuant to section 144
2 of title 23, United States Code;

3 (D) a detailed description of the scope of
4 the project;

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

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

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

16 (i) **AUTHORIZATION OF APPROPRIATIONS.**—There is
17 authorized to be appropriated to the Administrator to
18 carry out this section \$65,000,000 for each of fiscal years
19 2022 through 2026.

20 **SEC. 7. WATER INFRASTRUCTURE INNOVATION PROGRAM.**

21 (a) **ESTABLISHMENT.**—The Administrator of the En-
22 vironmental Protection Agency (referred to in this section
23 as the “Administrator”) shall establish a grant program,
24 to be known as the “Water Infrastructure Innovation Pro-
25 gram”, to provide grants for the design and installation

1 of water infrastructure projects, including wastewater
2 transport and treatment systems and drinking water
3 treatment and distribution systems, that use innovative
4 materials to reduce total costs, including operation and
5 preservation expenses, and extend the service life of in-
6 stalled structures.

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

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

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

17 (2) use innovative materials that—

18 (A) are resistant to degradation;

19 (B) extend service life; or

20 (C) provide long-term protection of water
21 facilities and systems.

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

1 (e) SPECIAL CONSIDERATION FOR AT-RISK
2 AREAS.—In providing grants under this section, the Ad-
3 ministrator shall give special consideration to projects lo-
4 cated in areas that are prone to saltwater intrusion or
5 flooding due to severe storms, rain bursts, storm surges,
6 or projected sea level rise during the projected lifetime of
7 the project.

8 (f) RECORDKEEPING; REPORTS.—

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

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

24 (A) the status of the project;

25 (B) the location of the project;

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

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

6 (E) the condition, operations, and perform-
7 ance of the project; and

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

13 (g) AUTHORIZATION OF APPROPRIATIONS.—There is
14 authorized to be appropriated to the Administrator to
15 carry out this section \$65,000,000 for each of fiscal years
16 2022 through 2026.

17 **SEC. 8. INNOVATIVE PROJECT DELIVERY FEDERAL SHARE.**

18 (a) IN GENERAL.—Section 120(c)(3)(B) of title 23,
19 United States Code, is amended—

20 (1) by striking clauses (i) and (ii) and inserting
21 the following:

22 “(i) prefabricated bridge elements and
23 systems, innovative materials, and other
24 technologies to reduce bridge construction
25 time, extend service life, and reduce preser-

1 vation costs, as compared to conventionally
 2 designed and constructed bridges;

3 “(ii) innovative construction equip-
 4 ment, materials, techniques, or practices,
 5 including the use of in-place recycling tech-
 6 nology, digital 3-dimensional modeling
 7 technologies, and advanced digital con-
 8 struction management systems;”;

9 (2) in clause (v), by striking “or” at the end;

10 (3) by redesignating clause (vi) as clause (vii);

11 and

12 (4) by inserting after clause (v) the following:

13 “(vi) innovative pavement materials
 14 that demonstrate reductions in greenhouse
 15 gas emissions through sequestration or in-
 16 novative manufacturing processes; or”.

17 (b) TECHNICAL AMENDMENT.—Section 107(a)(2) of
 18 title 23, United States Code, is amended by striking “sub-
 19 section (c) of”.

○