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

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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.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Innovative Materials for America's Growth and Infrastructure Newly Expanded Act of 2021'' or the ''IMAGINE Act''.

SEC. 2. PURPOSES.

The purposes of this Act are—

(1) to encourage the research and use of innovative materials, in concert with traditional materials, and associated techniques in the construction and preservation of the domestic infrastructure network;

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

(3) to improve the economy, resilience, maintainability, sustainability, and safety of the domestic infrastructure network.

SEC. 3. INTERAGENCY INNOVATIVE MATERIALS STANDARDS TASK FORCE.

(a) DEFINITION OF INNOVATIVE MATERIAL.—In this section, the term ''innovative material'', with respect to an infrastructure project, includes a material, or a combination or process for use of materials, that, as determined by the appropriate Secretary or agency head—

(1) enhances the overall service life, sustainability, and resiliency of the project; or

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

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

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

materials, and associated techniques in the construction and preservation of the domestic infrastructure network;

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

(3) to improve the economy, resilience, maintainability, sustainability, and safety of the domestic infrastructure network.

(c) ESTABLISHMENT.—

(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Director of the National Institute of Standards and Technology shall establish an Interagency Innovative Materials Standards Task Force (referred to in this section as the ''Task Force'') composed of the heads of Federal agencies responsible for significant civil infrastructure projects, including the Administrator of the Federal Highway Administration.

(2) CHAIRPERSON.—The Director of the National Institute of Standards and Technology shall serve as Chairperson of the Task Force.

(d) DUTIES.—The Task Force shall coordinate and improve, with respect to infrastructure construction, retrofitting, rehabilitation, and other improvements—

(1) Federal testing standards;

(2) Federal design and use guidelines;

(3) Federal regulations; and

(4) other applicable standards and performance and sustainability metrics.

(e) REPORT.—

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

(A) to assess the standards and performance metrics for the use of innovative materials in infrastructure projects;

(B) to identify any barriers, regulatory or otherwise, relating to the standards described in subparagraph (A) that preclude the use of certain products or associated techniques; and

(C) to identify opportunities for the development of standardized designs and materials genome approaches that design and use innovative materials to reduce costs, improve performance and sustainability, and extend the service life of infrastructure assets.

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

(A) identify any non-Federal entities or other organizations, including the American Association of State Highway and Transportation Officials, that develop relevant standards; and

(B) outline a strategy to improve coordination and information sharing between the entities described in subparagraph (A) and any relevant Federal agencies.

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

(1) to identify and carry out appropriate research, testing methods, and processes relating to the development and use of innovative materials;

(2) to develop new methods and processes relating to the development and use of innovative materials, as the applicable agency head determines to be necessary;

(3) to contribute to the development of standards, performance metrics, and guidelines for the use of innovative materials and approaches in civil infrastructure projects;

(4) to develop a plan for addressing potential barriers, regulatory or otherwise, identified in subsection (e)(1)(B); and

(5) to develop a plan for the development of standardized designs that use innovative materials to reduce costs, improve performance and sustainability, and extend the service life of infrastructure assets.

SEC. 4. INNOVATIVE MATERIAL INNOVATION HUBS.

(a) DEFINITIONS.—In this section:

(1) HUB.—The term ''Hub'' means an Innovative Material Innovation Hub established under this section.

(2) INNOVATIVE MATERIAL.—The term ''innovative material'', with respect to an infrastructure project, includes a material, or a combination or process for use of materials, that, as determined by the Secretary—

(A) enhances the overall service life, sustainability, and resiliency of the project; or

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

(3) QUALIFYING ENTITY.—The term ''qualifying entity'' means—

(A) an institution of higher education (as defined in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)));

(B) an appropriate Federal or State entity, including a federally-funded research and development center of the Department of Transportation;

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

(D) a research and development entity in existence on the date of enactment of this Act focused on innovative materials that the Secretary determines to be similar in scope and intent to a Hub.

(4) SECRETARY.—The term ''Secretary'' means the Secretary of Transportation.

(b) ESTABLISHMENT.—

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

velopment, and commercial application of innovative materials.

(2) COORDINATION.—The Secretary shall ensure the coordination of, and avoid duplication of, the activities of each Hub with the activities of—

(A) other research entities of the Department of Transportation, including the Federal Highway Administration; and

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

(c) COMPETITIVE SELECTION PROCESS.—

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

(A) be composed of not fewer than 2 qualifying entities;

(B) operate subject to a binding agreement, entered into by each member of the consortium, that documents—

(i) the proposed partnership agreement, including the governance and management structure of the Hub;

(ii) measures the consortium will undertake 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.

(3) SELECTION.—

(A) IN GENERAL.—The Secretary shall select consortia for awards for the establishment and operation of Hubs through a competitive selection process.

(B) CONSIDERATIONS.—In selecting consortia under subparagraph (A), the Secretary shall consider—

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

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

(iii) the demonstrated ability of the recipient to conduct and support multidisciplinary, collaborative research, development, demonstration, standardized design development, and commercial application of innovative materials;

(iv) the demonstrated research, technology transfer, and education resources available to the recipient to carry out this section;

(v) the ability of the recipient to provide leadership in solving immediate and long-range national and regional transpor-

tation problems related to innovative materials;

(vi) the demonstrated ability of the recipient to disseminate results and spur the implementation of transportation research and education programs through national or statewide continuing education programs;

(vii) the demonstrated commitment of the recipient to the use of peer review principles and other research best practices in the selection, management, and dissemination of research projects;

(viii) the performance metrics to be used in assessing the performance of the recipient in meeting the stated research, technology transfer, education, and outreach goals; and

(ix) the ability of the recipient to implement the proposed program in a cost-efficient manner, including through cost sharing and overall reduced overhead, facilities, and administrative costs.

(4) TRANSPARENCY.—

(A) IN GENERAL.—The Secretary shall provide to each applicant, on request, any materials, including copies of reviews (with any information that would identify a reviewer redacted), used in the evaluation process of the proposal of the applicant.

(B) REPORTS.—The Secretary shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate a report the describes the overall review process under paragraph (2), given the considerations under paragraph (3)(B), that includes—

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

(ii) descriptions of the review process; and

(iii) explanations of the selected awards.

(d) AUTHORIZATION OF APPROPRIATIONS.—

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

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

(e) HUB OPERATIONS.—

(1) IN GENERAL.—Each Hub shall conduct, or provide for, multidisciplinary, collaborative research, development, demonstration, and commercial application of innovative materials.

(2) ACTIVITIES.—Each Hub shall—

(A) encourage collaboration and communication among the member qualifying entities of the consortium, as described in subsection (c)(1), and awardees;

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

(C) submit to the Department of Transportation an annual report summarizing the activities of the Hub, including information—

(i) detailing organizational expenditures; and

(ii) describing each project undertaken by the Hub, as it relates to conducting and supporting multidisciplinary, collaborative research, development, dem-

onstration, standardized design development, and commercial application of innovative materials; and

(D) monitor project implementation and coordination.

(3) CONFLICTS OF INTEREST.—Each Hub shall maintain conflict of interest procedures, consistent with the conflict of interest procedures of the Department of Transportation.

(4) PROHIBITION ON CONSTRUCTION AND RENOVATION.—

(A) IN GENERAL.—No funds provided under this section may be used for construction or renovation of new buildings, test beds, or additional facilities for Hubs.

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

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

SEC. 5. TURNER-FAIRBANK HIGHWAY RESEARCH CENTER.

Section 503(b)(7) of title 23, United States Code, is 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

''(II) to understand and identify—

''(aa) the needs of the State and Tribal agencies; and

''(bb) innovative materials that may be further researched, developed, and used to meet those needs.

''(iii) ACTIVITIES.—The collaboration described in clause (ii) may include—

''(I) the development of new training for State and Tribal agencies; and

''(II) the expansion of technical training that involves State or Tribal departments of transportation in the development of new construction designs for innovative materials at the Turner-Fairbank Highway Research Center.

''(iv) PRIORITY RESEARCH.—The Turner-Fairbank Highway Research Center shall prioritize research relating to—

''(I) the use of innovative materials in—

''(aa) bridges with a span equal to or greater than 50 feet;

''(bb) highway reconstruction and rehabilitation; and

''(cc) rural road infrastructure;

''(II) the development of standardized designs using innovative materials; and

''(III) coastal resiliency.

''(v) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this subparagraph $8,000,000 for each of fiscal years 2022 through 2026.''.

SEC. 6. INNOVATIVE BRIDGE PROGRAM.

(a) DEFINITION OF ADMINISTRATOR.—In this section, the term ''Administrator'' means the Administrator of the Federal Highway Administration.

(b) ESTABLISHMENT.—The Administrator shall establish a grant program, to be known as the ''Innovative Bridge Program'', to provide grants to State departments of transportation, Tribal governments, public toll authorities, and units of local government for—

(1) coastal or rural infrastructure bridge projects; and

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

(c) APPLICATIONS.—To be eligible to receive a grant under subsection (b), a State department of transportation, a unit of Tribal government, a public toll authority, or a unit of local government shall submit to the Administrator an application at such time, in such manner, and containing such information as the Administrator may require.

(d) ELIGIBLE PROJECTS.—To be eligible to receive a grant under this section, a coastal or rural infrastructure bridge project or a value engineering project shall—

(1) be for the purpose of construction, preservation, rehabilitation, or reconstruction of a bridge with a span equal to or greater than 50 feet;

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

(3) include multimodal transportation components, such as bicycle and pedestrian paths; and

(4) use innovative materials that—

(A) are resistant to corrosion; and

(B) extend the service life of the bridge.

(e) PREFERENCES.—In providing grants under this section, the Administrator shall give preference to proposed projects that—

(1) use materials that are domestically produced and sourced;

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

(3) include multimodal transportation components, such as bicycle and pedestrian paths; and

(4) retrofit a bridge.

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

(g) VALUE ENGINEERING USING INNOVATIVE MATERIALS.—Of the amounts made available to carry out this section, the Administrator shall set aside $10,000,000 for each of fiscal years 2022 through 2026 to provide funding to 1 or more State departments of transportation or units of Tribal or local government that submit to the Administrator an application to carry out value engineering of a standard bridge design to enhance the performance of the

bridge (including extending the service life of the bridge, increasing resistance to corrosion, and reducing construction and preservation costs) through the use of innovative materials.

(h) RECORDKEEPING; REPORTS.—

(1) RECORDKEEPING.—Not later than 1 year after the date of enactment of this Act, the Administrator shall develop a project recordkeeping system that maintains comprehensive, current, and accurate information on each grant provided under this section.

(2) REPORTS.—Not later than 2 years after the development of the recordkeeping system described in paragraph (1), and every 2 years thereafter, the Administrator shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate, and make publicly available, a report that describes, with respect to each project that receives a grant under this section—

(A) the status of the project;

(B) the location of the project;

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

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

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

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

(F) for each bridge involved in the project, the bridge condition, operations, and performance of the bridge; and

(G) in every third report submitted under this paragraph, the results of the regular monitoring and evaluation of the maintenance demands, projects, needs, and costs of each bridge in the project during the previous 6 years.

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

SEC. 7. WATER INFRASTRUCTURE INNOVATION PROGRAM.

(a) ESTABLISHMENT.—The Administrator of the Environmental Protection Agency (referred to in this section as the ''Administrator'') shall establish a grant program, to be known as the ''Water Infrastructure Innovation Program'', to provide grants for the design and installation

of water infrastructure projects, including wastewater transport and treatment systems and drinking water treatment and distribution systems, that use innovative materials to reduce total costs, including operation and preservation expenses, and extend the service life of installed structures.

(b) APPLICATIONS.—To be eligible to receive a grant under this section, an applicant shall submit to the Administrator an application at such time, in such manner, and containing such information as the Administrator may require.

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

(1) serve a community with a population between 3,301 and 99,999; and

(2) use innovative materials that—

(A) are resistant to degradation;

(B) extend service life; or

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

(d) PREFERENCE.—In providing grants under this section, the Administrator shall give preference to proposed projects that use materials that are domestically produced and sourced.

(e) SPECIAL CONSIDERATION FOR AT-RISK AREAS.—In providing grants under this section, the Administrator shall give special consideration to projects located in areas that are prone to saltwater intrusion or flooding due to severe storms, rain bursts, storm surges, or projected sea level rise during the projected lifetime of the project.

(f) RECORDKEEPING; REPORTS.—

(1) RECORDKEEPING.—Not later than 1 year after the date of enactment of this Act, the Administrator shall develop a project recordkeeping system that maintains comprehensive, current, and accurate information on each grant provided under this section.

(2) REPORTS.—Not later than 2 years after the development of the recordkeeping system described in paragraph (1), and every 2 years thereafter, the Administrator shall submit to the appropriate committees of Congress, including the Committee on Environment and Public Works of the Senate, and make publicly available a report describing, with respect to each project that receives a grant under this section—

(A) the status of the project;

(B) the location of the project;

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

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

(E) the condition, operations, and performance of the project; and

(F) in every third report submitted under this paragraph, the results of the regular monitoring and evaluation of the maintenance demands, projects, needs, and costs of the project during the previous 6 years.

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

SEC. 8. INNOVATIVE PROJECT DELIVERY FEDERAL SHARE.

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

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

"(i) prefabricated bridge elements and systems, innovative materials, and other technologies to reduce bridge construction time, extend service life, and reduce preser-

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

''(ii) innovative construction equipment, materials, techniques, or practices, including the use of in-place recycling technology, digital 3-dimensional modeling technologies, and advanced digital construction management systems;'';

(2) in clause (v), by striking ''or'' at the end;

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

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

''(vi) innovative pavement materials that demonstrate reductions in greenhouse gas emissions through sequestration or innovative manufacturing processes; or''.

(b) TECHNICAL AMENDMENT.—Section 107(a)(2) of title 23, United States Code, is amended by striking ''subsection (c) of''.

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