

ELECTION TECHNOLOGY RESEARCH ACT OF 2019

FEBRUARY 13, 2020.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Ms. JOHNSON of Texas, from the Committee on Science, Space, and Technology, submitted the following

R E P O R T

[To accompany H.R. 4990]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 4990) to direct the National Institute of Standards and Technology and the National Science Foundation to carry out research and other activities to promote the security and modernization of voting systems, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill as amended do pass.

CONTENTS

|                                                                     |      |
|---------------------------------------------------------------------|------|
|                                                                     | Page |
| I. Amendment .....                                                  | 2    |
| II. Purpose of the Bill .....                                       | 4    |
| III. Background and Need for the Legislation .....                  | 5    |
| IV. Committee Hearings .....                                        | 5    |
| V. Committee Consideration and Votes .....                          | 6    |
| VI. Summary of Major Provisions of the Bill .....                   | 6    |
| VII. Section-By-Section Analysis (By Title and Section) .....       | 6    |
| VIII. Committee Views .....                                         | 7    |
| IX. Cost Estimate .....                                             | 7    |
| X. Congressional Budget Office Cost Estimate .....                  | 8    |
| XI. Compliance with Public Law 104–4 (Unfunded Mandates) .....      | 10   |
| XII. Committee Oversight Findings and Recommendations .....         | 10   |
| XIII. Statement on General Performance Goals and Objectives .....   | 10   |
| XIV. Federal Advisory Committee Statement .....                     | 10   |
| XV. Duplication of Federal Programs .....                           | 10   |
| XVI. Earmark Identification .....                                   | 10   |
| XVII. Applicability to the Legislative Branch .....                 | 11   |
| XVIII. Statement on Preemption of State, Local, or Tribal Law ..... | 11   |
| XIX. Changes in Existing Law Made by the Bill, As Reported .....    | 11   |
| XX. Exchange of Committee Correspondence .....                      | 15   |
| XXI. Proceedings of Full Committee Markup .....                     | 17   |

## I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

## SECTION 1. SHORT TITLE.

This Act may be cited as the “Election Technology Research Act of 2019”.

## SEC. 2. NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

(a) VOTING SYSTEMS RESEARCH.—The Director of the National Institute of Standards and Technology, in collaboration with the National Science Foundation as appropriate, shall carry out a program of research on voting systems, including—

- (1) the cybersecurity of different components of such systems;
- (2) end-to-end verifiable systems;
- (3) Internet-enabled voting;
- (4) the accessibility and usability of different components of such systems;
- (5) voter privacy and data protection;
- (6) methods for auditing elections;
- (7) the interoperability of system technologies;
- (8) means for providing voters with the ability to easily check whether a ballot sent by mail has been dispatched to the voter and whether the voter's marked ballot has been received and accepted by the appropriate election official;
- (9) the reliability of various approaches to voter authentication; and
- (10) such other areas of research as the Director of the National Institute of Standards and Technology determines to be appropriate and related to the security and integrity of elections for Federal office.

(b) ELECTIONS SYSTEMS CENTER OF EXCELLENCE.—

(1) IN GENERAL.—The Director of the National Institute of Standards and Technology shall make an award to an institution of higher education or an eligible nonprofit organization (or a consortium thereof) to establish a Center of Excellence in Election Systems.

(2) COLLABORATIONS.—The Director shall ensure that the Center of Excellence includes a collaboration of institutions of higher education, nonprofit organizations, private sector entities, and State and local election officials.

(3) PURPOSE.—The purpose of the Center of Excellence shall be to—

(A) conduct measurement research and statistical analyses to inform the development of standards for technologies and processes that contribute to more secure, fair, and accessible elections;

(B) test and evaluate the security, usability, and accessibility of the technologies of voting systems, including the accessibility of poll book data by voters;

(C) research testing methods that could be used for the certification of voting system technologies;

(D) educate and train students studying in science, technology, engineering, and mathematics fields to conduct measurement science and standards research relevant to such systems; and

(E) foster collaboration among academic researchers, private sector vendors of election technology, and State and local election officials.

(4) REQUIREMENTS.—

(A) IN GENERAL.—An institution of higher education or an eligible nonprofit organization (or a consortium thereof) seeking funding under this subsection shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require.

(B) APPLICATIONS.—Each application under subparagraph (A) shall include a description of—

(i) how the Center will work with other research institutions, industry partners, and State or local election officials to identify the measurement, testing, and standards needs of voting systems and to leverage the expertise of election practitioners; and

(ii) how the Center will promote active collaboration among researchers in multiple disciplines involved in ensuring the security and integrity of such systems.

(C) SELECTION AND DURATION.—Each Center established under this section is authorized to carry out activities for a period of 5 years, renewable for an additional 5 years at the discretion of the Director.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section \$12,000,000 for each of the fiscal years 2020 through 2024.

### SEC. 3. NATIONAL SCIENCE FOUNDATION.

(a) **RESEARCH GRANTS.**—The Director of the National Science Foundation, in collaboration with the National Institute of Standards and Technology and other relevant agencies, as appropriate, shall award basic research grants to increase the understanding of cyber and other threats to voting systems and to inform the development of technologies, processes, and policies that contribute to more secure, fair, and accessible elections, including research on—

- (1) the cybersecurity of different components of such systems;
- (2) end-to-end verifiable systems;
- (3) the risks and benefits of Internet-enabled voting;
- (4) the human-technology interface, including the usability, accessibility, and comprehensibility of ballot design, ballot marking devices, and other components of such systems;
- (5) voter privacy and data protection;
- (6) voter practices regarding the verification of ballots generated by ballot marking devices and the likelihood that voters, both with and without disabilities, will recognize errors or omissions with respect to such ballots; and
- (7) such other topics as the Director determines to be appropriate and related to the integrity of elections.

(b) **ELECTIONS SYSTEMS RESEARCH CENTER.**—

(1) **IN GENERAL.**—The Director of the National Science Foundation, in consultation with the Director of the National Institute of Standards and Technology and the Secretary of Homeland Security, as appropriate, shall award grants to institutions of higher education or eligible nonprofit organizations (or consortia thereof) to establish at least 1 multidisciplinary center for elections systems research and education.

(2) **CONSORTIA.**—A consortia receiving an award under this subsection may include institutions of higher education, nonprofit organizations, private sector entities, and State and local election officials.

(3) **PURPOSE.**—The purpose of a center established with a grant awarded under this subsection shall be to—

- (A) conduct basic research to advance understanding of cyber and other threats to election systems and the conduct of secure, fair, and accessible elections;
- (B) conduct research that may inform the development of technologies, processes, and policies that contribute to more secure, fair, and accessible elections;
- (C) educate and train students studying in science, technology, engineering, and mathematics fields to conduct research relevant to election systems;
- (D) design curricula that address the growing organizational management and information technology needs of the election community; and
- (E) foster collaboration among academic researchers, private sector vendors of election technology, and State and local election officials.

(4) **REQUIREMENTS.**—

(A) **IN GENERAL.**—An institution of higher education or an eligible nonprofit organization (or a consortium thereof) seeking funding under this subsection shall submit an application to the Director of the National Science Foundation at such time, in such manner, and containing such information as the Director may require.

(B) **APPLICATIONS.**—Each application under subparagraph (A) shall include a description of—

- (i) how the center established with a grant awarded under this subsection will work with other research institutions, industry partners, and State and local election officials to identify research needs and leverage the expertise of election practitioners; and
- (ii) how the center will promote active collaboration among researchers in multiple disciplines involved in elections systems security, including computer science, data science, and social and behavioral sciences.

(5) **SELECTION AND DURATION.**—Each center established with a grant awarded under this section is authorized to carry out activities for a period of 5 years, renewable for an additional 5 years at the discretion of the Director.

(c) **AUTHORIZATION OF APPROPRIATIONS.**—There are authorized to be appropriated to carry out this section \$10,000,000 for each of the fiscal years 2020 through 2024.

### SEC. 4. OTHER ACTIVITIES OF NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY TO PROMOTE SECURITY AND MODERNIZATION OF VOTING SYSTEMS.

(a) **COMMON DATA FORMAT.**—The National Institute of Standards and Technology shall establish and make publicly available common data format specifications for

auditing, voter registration, and other elements of voting systems, and provide the specifications to the Technical Guidelines Development Committee of the Election Assistance Commission under section 221(e) of the Help America Vote Act of 2002 (52 U.S.C. 20961(e)).

(b) **ELECTIONS SYSTEMS CERTIFICATIONS.**—The National Institute of Standards and Technology shall work in collaboration with the Election Assistance Commission to update the process under which voting systems are certified pursuant to the Help America Vote Act of 2002 so that State and local election officials will be better able to carry out updates and otherwise modernize such systems.

(c) **TECHNICAL ASSISTANCE.**—The Director of the National Institute of Standards and Technology shall—

- (1) provide technical assistance to State and local election officials on the implementation of cybersecurity standards, privacy standards, risk assessments, risk-limiting audits, and technologies which are incorporated in the voluntary voting system guidelines issued under the Help America Vote Act of 2002; and
- (2) in collaboration with the Department of Homeland Security and the Election Assistance Commission, as appropriate, conduct outreach to State and local election officials in order to disseminate best practices for the implementation of such voluntary voting system guidelines.

#### **SEC. 5. GAO REPORT.**

Not later than 18 months after the date of enactment of this Act, the Comptroller General shall submit a report to Congress that—

- (1) addresses the extent to which efforts by the National Institute of Standards and Technology (NIST) to assist the Technical Guidelines Development Committee of the Election Assistance Commission in the development of voluntary voting systems guidelines have resulted in market-ready standardized voting equipment and software, and addresses the resources made available to NIST to carry out these activities;
- (2) addresses efforts by NIST to monitor and review the performance of laboratories accredited by the Elections Assistance Commission and to make recommendations for continuing accreditation, increased voting technology reliability, and the number of accredited private laboratories, and addresses resources made available to NIST to carry out these activities; and
- (3) addresses the extent to which the annual list of suggestions required to be submitted by NIST to the Election Assistance Commission for research issues for grants and pilot programs under section 271(d) of the Help America Vote Act of 2002 (52 U.S.C. 21041) and the evaluation of grants and programs by NIST has improved voting technology and been successful in encouraging the implementation of new technologies in voting systems and equipment.

#### **SEC. 6. AMENDMENTS TO THE HELP AMERICA VOTE ACT OF 2002.**

Section 301(b) of the Help America Vote Act of 2002 (52 U.S.C. 21081(b)) is amended—

- (1) in the matter preceding paragraph (1), by striking “this section” and inserting “this Act”;
- (2) by striking “and” at the end of paragraph (1);
- (3) by redesignating paragraph (2) as paragraph (6); and
- (4) by inserting after paragraph (1) the following new paragraphs:
  - “(2) any other paper or electronic technologies or processes for collecting, storing, or transmitting personal information of voters for use in the administration of elections for Federal office, including electronic poll books with respect to an election;
  - “(3) voter registration databases and systems, including online interfaces;
  - “(4) systems for carrying out post-election auditing;
  - “(5) chain-of-custody procedures; and”.

#### **SEC. 7. DEFINITIONS.**

In this Act—

- (1) the term “voting system” has the meaning given such term in section 301(b) of the Help America Vote Act of 2002 (52 U.S.C. 21081(b)), as amended by section 6; and
- (2) the term “State” means each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, and the Commonwealth of the Northern Mariana Islands.

## **II. PURPOSE OF THE BILL**

The purpose of this bill is to direct the National Institute of Standards and Technology and the National Science Foundation to

carry out research and other activities to promote the security and modernization of voting systems.

### III. BACKGROUND AND NEED FOR THE LEGISLATION

In October 2002, Congress passed the *Help America Vote Act* (HAVA) to modernize the voting process. HAVA established the Election Assistance Commission (EAC) to assist states in complying with HAVA and to distribute funds to states to use for authorized purposes under HAVA, including the purchase of voting systems. Many of those systems are still in use today and experience both security and reliability challenges.

The National Institute of Standards and Technology (NIST) has long carried out research on cybersecurity, privacy, and other topics relevant to voting systems and elections integrity. HAVA specifically authorized NIST to carry out research to inform the development of voluntary voting systems guidelines to be recommended to the EAC. NIST also provides technical assistance to states seeking to implement the guidelines. As part of its own broad science mission, the National Science Foundation (NSF) carries out fundamental computer science research activities with relevance to election technology and social science research with relevance to voter interface with elections technology.

Technology plays a significant role in today's election process beyond just the voting machine where a vote is cast. Thirty-seven states and the District of Columbia allow for online voter registration, and a transition from paper to electronic poll books, some of which maintain a live internet connection, has been underway for several years. Under the current law in HAVA, NIST has no legal mandate to make recommendations to the EAC with respect to the security of online voter registration portals or databases, e-poll books, or a number of other systems used before and after the casting of a vote, or to carry out testing or certification of such systems.

### IV. COMMITTEE HEARINGS

On June 25, 2019, the Research and Technology Subcommittee and the Investigations and Oversight Subcommittee held a joint hearing on election security and voting technology vulnerabilities. Members and witnesses discussed the research and other activities being carried out under HAVA, key findings and recommendations of the 2018 National Academies report, *Securing the Vote: Protecting American Democracy*, and potential policy strategies for protecting the full technology enterprise associated with election systems.

The Subcommittees heard testimony from five witnesses: Dr. Charles H. Romine, Director, Information Technology Laboratory, National Institute of Standards and Technology; Mr. Neal Kelley, Registrar of Voters, Orange County, California; Dr. Latanya Sweeney, Professor of Government and Technology in Residence, Department of Government, Harvard University, Institute for Quantitative Social Science; Mr. Paul Zirias, Secretary, Oklahoma State Election Board; and Dr. Josh Benaloh, Senior Cryptographer, Microsoft Research.

The expert witnesses supported the need for more investment in basic, applied, and translational research relevant to the adminis-

tration, conduct, and performance of elections. They emphasized election cybersecurity and the need to understand the threats and vulnerabilities in order to develop more effective strategies to defend U.S. election systems. Finally, they stressed the need to modernize the elections process, including the need to establish common data formats for elements of voting systems to better protect against infiltration attempts. H.R. 4990 was informed by the expert testimony from this hearing and recommendations from the National Academies report.

#### V. COMMITTEE CONSIDERATION AND VOTES

H.R. 4990, the *Election Technology Research Act*, was introduced on November 8, 2019, by Representatives Sherrill, Gonzalez, Johnson, and Lucas. The bill was referred to the Committee on Science, Space, and Technology and the Committee on House Administration.

On November 14, 2019, the Committee on Science, Space, and Technology met to consider H.R. 4990. Mr. Crist offered an amendment to support research on pollbook accessibility for voters during the check-in process at polling stations. *The amendment was agreed to on a voice vote.* Ms. Johnson moved that the Committee favorably report the bill, H.R. 4990, as amended, to the House with the recommendation that the bill be approved. *The motion was agreed to by a voice vote.*

#### VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL

H.R. 4990 provides critical investments at the National Institute of Standards and Technology and the National Science Foundation to support cybersecurity research and modernization of our voting systems and to support federal technical assistance to states on implementation of cybersecurity standards and other voluntary voting systems guidelines. Further, H.R. 4990 makes amendments to the *Help America Vote Act of 2002* to authorize guidelines to be established for technologies used in the administration of elections.

#### VII. SECTION-BY-SECTION ANALYSIS (BY TITLE AND SECTION)

##### *Section 1. Short title*

Election Technology Research Act of 2019.

##### *Section 2. National Institute of Standards and Technology*

Authorizes NIST, in consultation with NSF, to carry out measurement research on a range of topics related to voting systems security and integrity; authorizes NIST to establish a Center of Excellence to foster collaboration among academic researchers, private sector election technology vendors, and State and local election officials on measurement research, statistical analyses, and testing related to voting systems security, usability, and accessibility.

##### *Section 3. National Science Foundation*

Authorizes NSF, in consultation with NIST and other relevant agencies, to award grants for basic research on a range of topics related to secure, fair and accessible elections; authorizes NSF, in consultation with NIST and the Department of Homeland Security,

to establish a multidisciplinary center of excellence to foster collaboration among institutions of higher education, non-profit organizations, private sector entities, and State and local officials on such research topics and to educate and train students to conduct research relevant to election systems.

*Section 4. Other activities of National Institute of Standards and Technology to promote security and modernization of voting systems*

Authorizes NIST to develop common data format specifications for voting systems to be provided to the Election Assistance Commission (EAC); authorizes NIST to work with the EAC to update the voting systems certification process; and authorizes NIST to provide technical assistance and conduct outreach to State and local election officials regarding implementation of standards and technologies incorporated into the Voluntary Voting Systems Guidelines under HAVA.

*Section 5. GAO report*

Directs GAO to submit a report to Congress assessing the role and effectiveness of NIST in assisting the EAC to advance voting technology and improve the implementation of standardized voting systems.

*Section 6. Amendments to the Help America Vote Act of 2002*

Amends HAVA to expand the definition of voting systems to include online voter registration systems and electronic poll books as categories of technologies and processes that NIST, in collaboration with the EAC, is authorized to develop voluntary voting systems guidelines.

## VIII. COMMITTEE VIEWS

It is the intent of the Committee that the Director of National Institute of Standards and Technology leverage the agency's expertise in measurement science and statistical analysis, and the Director of the National Science Foundation leverage the agency's expertise in fundamental computer science, social and behavioral sciences, and other relevant fields to help our nation move toward more secure federal elections.

In including electronic poll books in the definition of "voting System", it is not the intent of the Committee to capture any state's department of motor vehicle data other than data transmitted for purposes of federal election administration.

## IX. COST ESTIMATE

Pursuant to clause 3(c)(2) of rule XIII of the Rules of the House of Representatives, the Committee adopts as its own the estimate of new budget authority, entitlement authority, or tax expenditures or revenues contained in the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

## X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

U.S. CONGRESS,  
CONGRESSIONAL BUDGET OFFICE,  
Washington, DC, February 5, 2020.

Hon. EDDIE BERNICE JOHNSON,  
Chairwoman, Committee on Science, Space, and Technology,  
House of Representatives, Washington, DC.

DEAR MADAM CHAIRWOMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 4990, the Election Technology Research Act of 2019.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is David Hughes.

Sincerely,

PHILLIP L. SWAGEL,  
Director.

Enclosure.

| At a Glance                                                                                          |      |                                     |               |
|------------------------------------------------------------------------------------------------------|------|-------------------------------------|---------------|
| H.R. 4990, Election Technology Research Act of 2019                                                  |      |                                     |               |
| As ordered reported by the House Committee on Science, Space, and Technology on November 14, 2019    |      |                                     |               |
| By Fiscal Year, Millions of Dollars                                                                  | 2020 | 2020-2025                           | 2020-2030     |
| Direct Spending (Outlays)                                                                            | 0    | 0                                   | 0             |
| Revenues                                                                                             | 0    | 0                                   | 0             |
| Increase or Decrease (-)<br>in the Deficit                                                           | 0    | 0                                   | 0             |
| Spending Subject to<br>Appropriation (Outlays)                                                       | *    | 108                                 | not estimated |
| Statutory pay-as-you-go<br>procedures apply?                                                         | No   | Mandate Effects                     |               |
| Increases on-budget deficits in any<br>of the four consecutive 10-year<br>periods beginning in 2031? | No   | Contains intergovernmental mandate? | No            |
|                                                                                                      |      | Contains private-sector mandate?    | No            |
| * = between zero and \$500,000.                                                                      |      |                                     |               |

The bill would

- Require the National Institute of Standards and Technology (NIST) to study voting systems and to establish and administer a grant program to fund the proposed Center of Excellence in Election Systems
- Require the National Science Foundation to award grants to fund research about threats to voting systems and the cybersecurity of those systems
- Require NIST and the Election Assistance Commission to update certification processes for voting systems and to provide technical assistance to state and local election officials on voting systems and cybersecurity

Estimated budgetary effects would primarily stem from

- Spending subject to appropriation on salaries and benefits, contracting costs, equipment purchases, and grants

Bill summary: Section 2 would authorize the appropriation of \$12 million each year over the 2020–2024 period for the National Insti-



tute of Standards and Technology (NIST). Under the bill, NIST would study voting systems, including online voting, election audits, and cybersecurity, and establish the proposed Center of Excellence in Election Systems. That center would study voting systems, test the security and usability of voting technologies, and foster partnerships among academic institutions, the private sector, and state and local election officials.

Section 3 would authorize the appropriation of \$10 million annually over the 2020–2024 period for the National Science Foundation (NSF) to award grants to academic institutions and nonprofit organizations for research on cybersecurity and other threats to voting systems and to establish at least one center for research and education on election systems.

Under section 4, NIST would establish and publish common data format specifications for auditing and voter registration and provide those specifications to the Technical Guidelines Development Committee of the Election Assistance Commission (EAC). NIST and the EAC would collaborate to update the process for certifying voting systems as required by the Help America Vote Act of 2002 and to conduct outreach to state and local election officials on voluntary voting system guidelines. NIST also would provide technical assistance to state and local governments on voting technology, risk assessments, and implementing cybersecurity and privacy standards.

**Estimated Federal cost:** The estimated budgetary effect of H.R. 4990 is shown in Table 1. The costs of the legislation fall within budget functions 370 (commerce and housing credit) and 800 (general government).

**Basis of estimate:** CBO assumes that H.R. 4990 will be enacted in 2020. CBO estimates that implementing H.R. 4990 would increase spending subject to appropriation by \$108 million over the 2020–2025 period. That estimate is based on information from the agencies and historical spending patterns for similar activities.

Implementing section 2 and section 3 would cost \$80 million over the 2020–2025 period—\$43 million for NIST and \$37 million for NSF—and \$30 million after 2025, assuming appropriation of the authorized amounts.

Using information from NIST, CBO estimates that NIST and EAC would need a total of 22 employees each year at a cost of \$250,000 per employee to fulfill the requirements in section 4. In total, CBO estimates that it would cost NIST and the EAC \$27 million over the 2020–2025 period to implement those requirements, assuming appropriation of the estimated amounts.

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER H.R. 4990

|                               | By fiscal year, millions of dollars— |      |      |      |      |      |           |
|-------------------------------|--------------------------------------|------|------|------|------|------|-----------|
|                               | 2020                                 | 2021 | 2022 | 2023 | 2024 | 2025 | 2020–2025 |
| Section 2:                    |                                      |      |      |      |      |      |           |
| Authorization .....           | 12                                   | 12   | 12   | 12   | 12   | 0    | 60        |
| Estimated Outlays .....       | *                                    | 6    | 9    | 11   | 12   | 6    | 43        |
| Section 3:                    |                                      |      |      |      |      |      |           |
| Authorization .....           | 10                                   | 10   | 10   | 10   | 10   | 0    | 50        |
| Estimated Outlays .....       | *                                    | 5    | 8    | 9    | 10   | 5    | 37        |
| Section 4:                    |                                      |      |      |      |      |      |           |
| Estimated Authorization ..... | *                                    | 6    | 5    | 5    | 6    | 6    | 29        |

TABLE 1.—ESTIMATED INCREASES IN SPENDING SUBJECT TO APPROPRIATION UNDER H.R. 4990—Continued

|                               | By fiscal year, millions of dollars— |      |      |      |      |      |               |
|-------------------------------|--------------------------------------|------|------|------|------|------|---------------|
|                               | 2020                                 | 2021 | 2022 | 2023 | 2024 | 2025 | 2020–<br>2025 |
| Estimated Outlays .....       | *                                    | 5    | 5    | 5    | 6    | 6    | 27            |
| Total Changes:                |                                      |      |      |      |      |      |               |
| Estimated Authorization ..... | 22                                   | 28   | 27   | 27   | 28   | 6    | 139           |
| Estimated Outlays .....       | *                                    | 16   | 22   | 25   | 27   | 17   | 108           |

Components may not sum to totals because of rounding; \* = between zero and \$500,000.

Pay-As-You-Go considerations: None.

Increase in long-term deficits: None.

Mandates: None.

Estimate prepared by: Federal costs: David Hughes (for the National Institute of Standards and Technology), Janani Shankaran (for the National Science Foundation), Matthew Pickford (for the Election Assistance Commission); Mandates: Rachel Austin.

Estimate reviewed by: Kim P. Cawley, Chief, Natural and Physical Resources Cost Estimates Unit; H. Samuel Papenfuss, Deputy Director of Budget Analysis.

#### XI. FEDERAL MANDATES STATEMENT

H.R. 4990 contains no unfunded mandates.

#### XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The Committee's oversight findings and recommendations are reflected in the body of this report.

#### XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

The goal of H.R. 4990 is to improve the security of election systems through research and other activities.

#### XIV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 4990, does not create any advisory committees.

#### XV. DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII of the Rules of the House of Representatives, the Committee finds that no provision of H.R. 4990 establishes or reauthorizes a program of the federal government known to be duplicative of another federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111–139 or the most recent Catalog of Federal Domestic Assistance.

#### XVI. EARMARK IDENTIFICATION

Pursuant to clause 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 4990 contains no earmarks, limited tax benefits, or limited tariff benefits.

## XVII. APPLICABILITY TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 4990 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

## XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

## XIX. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, and existing law in which no change is proposed is shown in roman):

**HELP AMERICA VOTE ACT OF 2002**

\* \* \* \* \*

## TITLE III—UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS

### Subtitle A—Requirements

**SEC. 301. VOTING SYSTEMS STANDARDS.**

(a) **REQUIREMENTS.**—Each voting system used in an election for Federal office shall meet the following requirements:

(1) **IN GENERAL.**—

(A) Except as provided in subparagraph (B), the voting system (including any lever voting system, optical scanning voting system, or direct recording electronic system) shall—

(i) permit the voter to verify (in a private and independent manner) the votes selected by the voter on the ballot before the ballot is cast and counted;

(ii) provide the voter with the opportunity (in a private and independent manner) to change the ballot or correct any error before the ballot is cast and counted (including the opportunity to correct the error through the issuance of a replacement ballot if the voter was otherwise unable to change the ballot or correct any error); and

(iii) if the voter selects votes for more than one candidate for a single office—

(I) notify the voter that the voter has selected more than one candidate for a single office on the ballot;

(II) notify the voter before the ballot is cast and counted of the effect of casting multiple votes for the office; and

(III) provide the voter with the opportunity to correct the ballot before the ballot is cast and counted.

(B) A State or jurisdiction that uses a paper ballot voting system, a punch card voting system, or a central count voting system (including mail-in absentee ballots and mail-in ballots), may meet the requirements of subparagraph (A)(iii) by—

(i) establishing a voter education program specific to that voting system that notifies each voter of the effect of casting multiple votes for an office; and

(ii) providing the voter with instructions on how to correct the ballot before it is cast and counted (including instructions on how to correct the error through the issuance of a replacement ballot if the voter was otherwise unable to change the ballot or correct any error).

(C) The voting system shall ensure that any notification required under this paragraph preserves the privacy of the voter and the confidentiality of the ballot.

(2) AUDIT CAPACITY.—

(A) IN GENERAL.—The voting system shall produce a record with an audit capacity for such system.

(B) MANUAL AUDIT CAPACITY.—

(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

(iii) The paper record produced under subparagraph (A) shall be available as an official record for any recount conducted with respect to any election in which the system is used.

(3) ACCESSIBILITY FOR INDIVIDUALS WITH DISABILITIES.—The voting system shall—

(A) be accessible for individuals with disabilities, including nonvisual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

(B) satisfy the requirement of subparagraph (A) through the use of at least one direct recording electronic voting system or other voting system equipped for individuals with disabilities at each polling place; and

(C) if purchased with funds made available under title II on or after January 1, 2007, meet the voting system standards for disability access (as outlined in this paragraph).

(4) ALTERNATIVE LANGUAGE ACCESSIBILITY.—The voting system shall provide alternative language accessibility pursuant

to the requirements of section 203 of the Voting Rights Act of 1965 (42 U.S.C. 1973aa-1a).

(5) ERROR RATES.—The error rate of the voting system in counting ballots (determined by taking into account only those errors which are attributable to the voting system and not attributable to an act of the voter) shall comply with the error rate standards established under section 3.2.1 of the voting systems standards issued by the Federal Election Commission which are in effect on the date of the enactment of this Act.

(6) UNIFORM DEFINITION OF WHAT CONSTITUTES A VOTE.—Each State shall adopt uniform and nondiscriminatory standards that define what constitutes a vote and what will be counted as a vote for each category of voting system used in the State.

(b) VOTING SYSTEM DEFINED.—In **[this section]** *this Act*, the term “voting system” means—

(1) the total combination of mechanical, electromechanical, or electronic equipment (including the software, firmware, and documentation required to program, control, and support the equipment) that is used—

- (A) to define ballots;
- (B) to cast and count votes;
- (C) to report or display election results; and
- (D) to maintain and produce any audit trail information;

**[and]**

(2) *any other paper or electronic technologies or processes for collecting, storing, or transmitting personal information of voters for use in the administration of elections for Federal office, including electronic poll books with respect to an election;*

(3) *voter registration databases and systems, including online interfaces;*

(4) *systems for carrying out post-election auditing;*

(5) *chain-of-custody procedures; and*

**[(2)]** (6) the practices and associated documentation used—

- (A) to identify system components and versions of such components;
- (B) to test the system during its development and maintenance;
- (C) to maintain records of system errors and defects;
- (D) to determine specific system changes to be made to a system after the initial qualification of the system; and
- (E) to make available any materials to the voter (such as notices, instructions, forms, or paper ballots).

(c) CONSTRUCTION.—

(1) IN GENERAL.—Nothing in this section shall be construed to prohibit a State or jurisdiction which used a particular type of voting system in the elections for Federal office held in November 2000 from using the same type of system after the effective date of this section, so long as the system meets or is modified to meet the requirements of this section.

(2) PROTECTION OF PAPER BALLOT VOTING SYSTEMS.—For purposes of subsection (a)(1)(A)(i), the term “verify” may not be defined in a manner that makes it impossible for a paper ballot voting system to meet the requirements of such subsection or to be modified to meet such requirements.

(d) EFFECTIVE DATE.—Each State and jurisdiction shall be required to comply with the requirements of this section on and after January 1, 2006.

\* \* \* \* \*

XX. EXCHANGE OF COMMITTEE CORRESPONDENCE

EDDIE BERNICE JOHNSON, Texas  
CHAIRWOMAN

FRANK D. LUCAS, Oklahoma  
RANKING MEMBER

Congress of the United States  
House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

2321 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515-6301

(202) 225-6375  
[www.science.house.gov](http://www.science.house.gov)

February 10, 2020

Chairperson Zoe Lofgren  
Committee on House Administration  
U.S. House of Representatives  
1309 Longworth House Office Building  
Washington, DC 20515

Dear Chairperson Lofgren,

I am writing to you concerning H.R. 4990, the "Election Technology Research Act of 2019," which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on House Administration on November 8, 2019.

I appreciate your willingness to work cooperatively on this bill. I recognize that the bill contains provisions that fall within the jurisdiction of the Committee on House Administration. I appreciate that your Committee will waive further consideration of H.R. 4990 and that this action is not a waiver of future jurisdictional claims by the Committee on House Administration over this subject matter.

I will make sure to include our exchange of letters in the legislative report for H.R. 4990 and in the *Congressional Record*. Thank you for your cooperation on this legislation.

Sincerely,



Eddie Bernice Johnson  
Chairwoman  
Committee on Science, Space, and Technology

cc: Ranking Member Frank D. Lucas, Committee on Science, Space, and Technology  
Ranking Member Rodney Davis, Committee on House Administration  
Tom Wickham, Parliamentarian

ZOE LOFGREN, CALIFORNIA  
CHAIRPERSON

JAMIE RASKIN, MARYLAND  
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JAMIE FLEET, STAFF DIRECTOR

**Congress of the United States**

**House of Representatives  
COMMITTEE ON HOUSE ADMINISTRATION**

1309 Longworth House Office Building  
Washington, D.C. 20515-6157  
(202) 225-2061  
<https://cha.house.gov>

RODNEY DAVIS, ILLINOIS  
RANKING MINORITY MEMBER

MARK WALKER, NORTH CAROLINA  
BARRY LOUDERMILK, GEORGIA

ONE HUNDRED SIXTEENTH CONGRESS

JEN DAULBY, MINORITY STAFF DIRECTOR

February 10, 2020

The Honorable Eddie Bernice Johnson  
Chairwoman, Committee on Science, Space, and Technology  
U.S. House of Representatives  
Washington, DC 20515

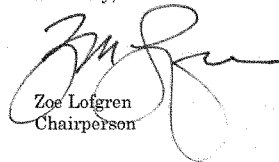
Dear Chairwoman Johnson:

I am writing to you regarding H.R. 4990, the "Election Technology Research Act of 2019." This measure, introduced on November 8, 2019, was referred to your committee as well as the Committee on House Administration.

The Committee on House Administration agrees to waive further consideration of H.R. 4990. The Committee does so with the understanding that by waiving further consideration of this bill it does not waive any future jurisdictional claims over similar measures. In addition, the Committee reserves its right to seek conferees on any provisions within its jurisdiction which are considered in a House-Senate conference and requests your support if such a request is made.

I would appreciate the inclusion of this letter and a copy of your response in the *Congressional Record* during consideration of H.R. 4990 on the House floor.

Sincerely,



Zoe Lofgren  
Chairperson



XXI. PROCEEDINGS OF THE FULL COMMITTEE MARKUP

**MARKUPS:**  
**H.R. 4704, ADVANCING RESEARCH**  
**TO PREVENT SUICIDE ACT;**  
**H.R. 4990, ELECTION TECHNOLOGY**  
**RESEARCH ACT; AND**  
**H.R. 4979, RURAL STEM EDUCATION ACT**

---

**MARKUP**  
BEFORE THE  
**COMMITTEE ON SCIENCE, SPACE, AND**  
**TECHNOLOGY**  
**HOUSE OF REPRESENTATIVES**  
ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

NOVEMBER 14, 2019

**Serial No. CP: 116-11**

Printed for the use of the Committee on Science, Space, and Technology



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WASHINGTON : 2019

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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 SUZANNE BONAMICI, Oregon  
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 GREGORY F. MURPHY, North Carolina

# C O N T E N T S

November 14, 2019

|                                                                   |      |
|-------------------------------------------------------------------|------|
|                                                                   | Page |
| H.R. 4704— <i>Advancing Research to Prevent Suicide Act</i> ..... | 4    |
| H.R. 4990— <i>Election Technology Research Act</i> .....          | 14   |
| H.R. 4979— <i>Rural STEM Education Act</i> .....                  | 33   |

**MARKUPS:**  
**H.R. 4704, ADVANCING RESEARCH  
 TO PREVENT SUICIDE ACT;  
 H.R. 4990, ELECTION TECHNOLOGY  
 RESEARCH ACT; AND  
 H.R. 4979, RURAL STEM EDUCATION ACT**

THURSDAY, NOVEMBER 14, 2019

HOUSE OF REPRESENTATIVES,  
 COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,  
*Washington, D.C.*

The Committee met, pursuant to notice, at 10:05 a.m., in room 2318 of the Rayburn House Office Building, Hon. Eddie Bernice Johnson [Chairwoman of the Committee] presiding.

Chairwoman JOHNSON. Good morning. The Committee will come to order. Without objection, the Chair is authorized to declare recess at any time. Pursuant to Committee rule 2(e) and House rule XI, the Chair announces that she may postpone roll call votes.

Pursuant to notice, the Committee meets to consider the following measures: H.R. 4704, *Advancing Research to Prevent Suicide Act*; H.R. 4990, *Election Technology Research Act*; and H.R. 4979, *Rural STEM Education Act*.

Welcome to this markup. And I think we have three excellent bills. I want to thank Representatives McAdams, Gonzalez, and Balderson for introducing our first bill we're considering, H.R. 4704, the *Advancing Research to Prevent Suicide Act*.

Suicide is a major public health concern and a leading cause of death in America. Tragically, suicide is the second-leading cause of death of young people between the ages of 10 and 34. While our understanding of suicide has increased over the last 50 years, more research is needed.

This bill directs the National Science Foundation (NSF) to support research to improve our understanding of the complex risk factors that contribute to suicidal thoughts and behavior and inform efforts to save lives. This is a critically important issue, and I thank my colleague from Utah for his efforts to address the problem.

We will next consider H.R. 4990, the *Election Technology Research Act*. A year from now, America will go to the polls to elect a President, select their Representatives in Congress, and make many other important choices at the local and State level. Transparent, fair, and secure elections are the bedrock of our democracy.

While it is human behavior that governs the integrity of elections, the technologies used in elections are a source of vulnerability.

Unfortunately, recent elections have been marred by several incidences involving outdated, malfunctioning voting machines. In addition, online voting registration databases in a number of States have been subject to attempted cyberattacks. These incidents have increased Americans' concern about the integrity of our elections.

The *Election Technology Research Act* makes critical investments at the National Institute of Standards and Technology (NIST) and the National Science Foundation to support cybersecurity research and modernization of our voting systems. I want to thank Representatives Sherrill and Gonzalez for introducing this good bipartisan bill. It is an important piece of the larger national discussion about ensuring the integrity of our elections.

The last bill we are considering today is H.R. 4979, the *Rural STEM Education Act*. I want to thank Ranking Member Lucas, Representative McAdams, and Representative Baird for introducing H.R. 4979. As Members of the Science Committee, we know that diversity in STEM (science, technology, engineering, and mathematics) is important. We need talented minds from all backgrounds at the table to ensure we can continue to innovate and compete globally.

Unfortunately, students living in rural communities are often overlooked in efforts to address STEM diversity. This legislation directs the National Science Foundation to support much-needed research and program development to help address the challenges rural communities face in providing high-quality STEM education. I urge my colleagues to support its passage out of Committee.

I look forward to considering each of these good bipartisan bills today and quickly moving them to the full House.

[The prepared statement of Chairwoman Johnson follows:]

Good morning and welcome to today's markup of what I think are three excellent bills.

I want to thank Representatives McAdams, Gonzalez, and Balderson for introducing our first bill we are considering: H.R. 4704, the *Advancing Research to Prevent Suicide Act*.

Suicide is a major public health concern and a leading cause of death in America. Tragically, suicide is the second leading cause of death for young people between the ages of 10 and 34. While our understanding of suicide has increased over the past 50 years, more research is needed.

This bill directs the National Science Foundation to support research to improve our understanding of the complex risk factors that contribute to suicidal thoughts and behavior and inform efforts to save lives.

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We will next consider H.R. 4990, the *Election Technology Research Act*.

A year from now, America will go to the polls to elect a president, select their representatives in Congress, and make many other important choices at the local and state level.

Transparent, fair, and secure elections are the bedrock of our democracy. While it is human behavior that governs the integrity of elections, the technologies used in elections are a source of vulnerability. Unfortunately, recent elections have been marred by several incidents involving outdated, malfunctioning voting machines. In addition, online voter registration databases in a number of states have been subject to attempted cyberattacks.

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This legislation directs the National Science Foundation to support much-needed research and program development to help to address the challenges rural communities face in providing high-quality STEM education. I urge my colleagues to support its passage out of Committee.

I look forward to considering each of these good bipartisan bills today, and quickly moving them to the full House.

Chairwoman JOHNSON. I now recognize our Ranking Member, Mr. Lucas, for his opening remarks.

Mr. LUCAS. Thank you, Chairwoman Johnson, for holding this markup. Today, we'll consider three bipartisan bills.

The first is H.R. 4704, the *Advancing Research to Prevent Suicide Act*. I want to thank the bill's sponsors, Mr. McAdams and Mr. Gonzalez, for working together to address this critical issue.

Suicide was the 10th-leading cause of death in the United States in 2016, and the second-leading cause of death among people ages 10 to 34. For our Nation's veterans, it is an epidemic. We lose 17 veterans in America a day to suicide.

Despite these rising numbers, there are still major gaps in our fundamental understanding of the underpinnings of suicide and how to prevent it. According to the experts, much more research is needed to understand how people respond to stress, how social influence impacts suicide, and what makes some people more resilient than others.

This bill will support basic research at the National Science Foundation to improve our understanding of such factors. Basic research in this area will help inform better interventions and better outcomes. I urge my colleagues to support the bill.

Next, we'll consider H.R. 4990, the *Election Technology Research Act*. I am proud to join with Representatives Sherrill and Gonzalez and Chairwoman Johnson as a cosponsor of this bill. The integrity and security of elections is fundamental to democracy in the United States, and it should not be a partisan issue. This bill makes appropriate steps to update research activities at the National Science Foundation and NIST to promote the security and modernization of U.S. voting systems. The bill also establishes the Election Systems Center of Excellence at NIST to foster collaborations between NIST, universities, and State and local officials to address security challenges.

The U.S. Constitution vests the responsibility of administering elections with State and local governments. However, the Federal Government has an important role to play in providing guidance and assistance to States on election systems. The Federal Government can and should also work closely with State and local officials to deal with foreign and domestic cyber threats. This bill provides the research tools to do that without imposing costly or burdensome mandates on the States.

I appreciate Chairwoman Johnson and her staff for working with us to produce a good bipartisan bill, and I urge my colleagues to support it.

Finally, we'll consider H.R. 4979, the *Rural STEM Education Act*, a bill I introduced with Representative McAdams, Chairwoman Johnson, and Representative Baird. I'll speak more on the bill when we take it up in a few minutes.

I once again want to thank Chairwoman Johnson for holding today's markup of these three bipartisan bills, and I yield back.

[The prepared statement of Mr. Lucas follows:]

Thank you, Chairwoman Johnson, for holding this mark-up. Today we will consider three bipartisan bills.

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Integrity and security in elections are fundamental to democracy in the United States, and it should not be a partisan issue. This bill takes appropriate steps to update research activities at the National Science Foundation and NIST to promote the security and modernization of U.S. voting systems.

The bill also establishes an Election Systems Center of Excellence at NIST to foster collaborations between NIST, universities, and state and local election officials, to address security challenges.

The U.S. Constitution vests the responsibility of administering elections with State and local governments. However, the Federal government has an important role to play, in providing guidance and assistance to states on election systems. The Federal government can and should also work closely with State and local election officials to deal with foreign and domestic cyber threats. This bill provides the research tools to do that, without imposing costly or burdensome mandates on States.

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Finally, we will consider H.R. 4979, the *Rural STEM Education Act*, a bill I have introduced with Representative McAdams, Chairwoman Johnson and Representative Baird. I'll speak more on the bill when we take it up in a few minutes.

I once again want to thank Chairwoman Johnson for holding today's markup of these three bipartisan bills, and I yield back.

24

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H.R. 4990

Chairwoman JOHNSON. We now will consider H.R. 4990, *Election Technology Research Act*. The clerk will report the bill.

The CLERK. H.R. 4990, a bill to direct the National Institute—  
[The bill follows:]



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.....  
(Original Signature of Member)

116TH CONGRESS  
1ST SESSION

**H. R.** \_\_\_\_\_

To direct the National Institute of Standards and Technology and the National Science Foundation to carry out research and other activities to promote the security and modernization of voting systems, and for other purposes.

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IN THE HOUSE OF REPRESENTATIVES

Ms. SIERRILL (for herself and [see ATTACHED LIST of cosponsors]) introduced the following bill; which was referred to the Committee on

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**A BILL**

To direct the National Institute of Standards and Technology and the National Science Foundation to carry out research and other activities to promote the security and modernization of voting systems, 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 "Election Technology  
5 Research Act of 2019".

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1 **SEC. 2. NATIONAL INSTITUTE OF STANDARDS AND TECH-**  
2 **NOLOGY.**

3 (a) VOTING SYSTEMS RESEARCH.—The Director of  
4 the National Institute of Standards and Technology, in  
5 collaboration with the National Science Foundation as ap-  
6 propriate, shall carry out a program of research on voting  
7 systems, including—

- 8 (1) the cybersecurity of different components of  
9 such systems;  
10 (2) end-to-end verifiable systems;  
11 (3) Internet-enabled voting;  
12 (4) the accessibility and usability of different  
13 components of such systems;  
14 (5) voter privacy and data protection;  
15 (6) methods for auditing elections;  
16 (7) the interoperability of system technologies;  
17 (8) means for providing voters with the ability  
18 to easily check whether a ballot sent by mail has  
19 been dispatched to the voter and whether the voter's  
20 marked ballot has been received and accepted by the  
21 appropriate election official;  
22 (9) the reliability of various approaches to voter  
23 authentication; and  
24 (10) such other areas of research as the Direc-  
25 tor of the National Institute of Standards and Tech-  
26 nology determines to be appropriate and related to

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1 the security and integrity of elections for Federal of-  
2 fice.

3 (b) ELECTIONS SYSTEMS CENTER OF EXCEL-  
4 LENCE.—

5 (1) IN GENERAL.—The Director of the National  
6 Institute of Standards and Technology shall make  
7 an award to an institution of higher education or an  
8 eligible nonprofit organization (or a consortium  
9 thereof) to establish a Center of Excellence in Elec-  
10 tion Systems.

11 (2) COLLABORATIONS.—The Director shall en-  
12 sure that the Center of Excellence includes a col-  
13 laboration of institutions of higher education, non-  
14 profit organizations, private sector entities, and  
15 State and local election officials.

16 (3) PURPOSE.—The purpose of the Center of  
17 Excellence shall be to—

18 (A) conduct measurement research and  
19 statistical analyses to inform the development  
20 of standards for technologies and processes that  
21 contribute to more secure, fair, and accessible  
22 elections;

23 (B) test and evaluate the security,  
24 usability, and accessibility of the technologies of  
25 voting systems;

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1 (C) research testing methods that could be  
2 used for the certification of voting system tech-  
3 nologies;

4 (D) educate and train students studying in  
5 science, technology, engineering, and mathe-  
6 matics fields to conduct measurement science  
7 and standards research relevant to such sys-  
8 tems; and

9 (E) foster collaboration among academic  
10 researchers, private sector vendors of election  
11 technology, and State and local election offi-  
12 cials.

13 (4) REQUIREMENTS.—

14 (A) IN GENERAL.—An institution of higher  
15 education or an eligible nonprofit organization  
16 (or a consortium thereof) seeking funding under  
17 this subsection shall submit an application to  
18 the Director at such time, in such manner, and  
19 containing such information as the Director  
20 may require.

21 (B) APPLICATIONS.—Each application  
22 under subparagraph (A) shall include a descrip-  
23 tion of—

24 (i) how the Center will work with  
25 other research institutions, industry part-

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1           ners, and State or local election officials to  
 2           identify the measurement, testing, and  
 3           standards needs of voting systems and to  
 4           leverage the expertise of election practi-  
 5           tioners; and

6                   (ii) how the Center will promote active  
 7           collaboration among researchers in mul-  
 8           tiple disciplines involved in ensuring the se-  
 9           curity and integrity of such systems.

10           (C) SELECTION AND DURATION.—Each  
 11           Center established under this section is author-  
 12           ized to carry out activities for a period of 5  
 13           years, renewable for an additional 5 years at  
 14           the discretion of the Director.

15           (c) AUTHORIZATION OF APPROPRIATIONS.—There  
 16           are authorized to be appropriated to carry out this section  
 17           \$12,000,000 for each of the fiscal years 2020 through  
 18           2024.

19   **SEC. 3. NATIONAL SCIENCE FOUNDATION.**

20           (a) RESEARCH GRANTS.—The Director of the Na-  
 21           tional Science Foundation, in collaboration with the Na-  
 22           tional Institute of Standards and Technology and other  
 23           relevant agencies, as appropriate, shall award basic re-  
 24           search grants to increase the understanding of cyber and  
 25           other threats to voting systems and to inform the develop-

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1 ment of technologies, processes, and policies that con-  
2 tribute to more secure, fair, and accessible elections, in-  
3 cluding research on—

4 (1) the cybersecurity of different components of  
5 such systems;

6 (2) end-to-end verifiable systems;

7 (3) the risks and benefits of Internet-enabled  
8 voting;

9 (4) the human-technology interface, including  
10 the usability, accessibility, and comprehensibility of  
11 ballot design, ballot marking devices, and other com-  
12 ponents of such systems;

13 (5) voter privacy and data protection;

14 (6) voter practices regarding the verification of  
15 ballots generated by ballot marking devices and the  
16 likelihood that voters, both with and without disabil-  
17 ities, will recognize errors or omissions with respect  
18 to such ballots; and

19 (7) such other topics as the Director determines  
20 to be appropriate and related to the integrity of elec-  
21 tions.

22 (b) ELECTIONS SYSTEMS RESEARCH CENTER.—

23 (1) IN GENERAL.—The Director of the National  
24 Science Foundation, in consultation with the Direc-  
25 tor of the National Institute of Standards and Tech-

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1 nology and the Secretary of Homeland Security, as  
2 appropriate, shall award grants to institutions of  
3 higher education or eligible nonprofit organizations  
4 (or consortia thereof) to establish at least 1 multi-  
5 disciplinary center for elections systems research and  
6 education.

7 (2) CONSORTIA.—A consortia receiving an  
8 award under this subsection may include institutions  
9 of higher education, nonprofit organizations, private  
10 sector entities, and State and local election officials.

11 (3) PURPOSE.—The purpose of a center estab-  
12 lished with a grant awarded under this subsection  
13 shall be to—

14 (A) conduct basic research to advance un-  
15 derstanding of cyber and other threats to elec-  
16 tion systems and the conduct of secure, fair,  
17 and accessible elections;

18 (B) conduct research that may inform the  
19 development of technologies, processes, and  
20 policies that contribute to more secure, fair,  
21 and accessible elections;

22 (C) educate and train students studying in  
23 science, technology, engineering, and mathe-  
24 matics fields to conduct research relevant to  
25 election systems;

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1 (D) design curricula that address the  
 2 growing organizational management and infor-  
 3 mation technology needs of the election commu-  
 4 nity; and

5 (E) foster collaboration among academic  
 6 researchers, private sector vendors of election  
 7 technology, and State and local election offi-  
 8 cials.

9 (4) REQUIREMENTS.—

10 (A) IN GENERAL.—An institution of higher  
 11 education or an eligible nonprofit organization  
 12 (or a consortium thereof) seeking funding under  
 13 this subsection shall submit an application to  
 14 the Director of the National Science Founda-  
 15 tion at such time, in such manner, and con-  
 16 taining such information as the Director may  
 17 require.

18 (B) APPLICATIONS.—Each application  
 19 under subparagraph (A) shall include a descrip-  
 20 tion of—

21 (i) how the center established with a  
 22 grant awarded under this subsection will  
 23 work with other research institutions, in-  
 24 dustry partners, and State and local elec-  
 25 tion officials to identify research needs and



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1 leverage the expertise of election practi-  
2 tioners; and

3 (ii) how the center will promote active  
4 collaboration among researchers in mul-  
5 tiple disciplines involved in elections sys-  
6 tems security, including computer science,  
7 data science, and social and behavioral  
8 sciences.

9 (5) SELECTION AND DURATION.—Each center  
10 established with a grant awarded under this section  
11 is authorized to carry out activities for a period of  
12 5 years, renewable for an additional 5 years at the  
13 discretion of the Director.

14 (c) AUTHORIZATION OF APPROPRIATIONS.—There  
15 are authorized to be appropriated to carry out this section  
16 \$10,000,000 for each of the fiscal years 2020 through  
17 2024.

18 **SEC. 4. OTHER ACTIVITIES OF NATIONAL INSTITUTE OF**  
19 **STANDARDS AND TECHNOLOGY TO PROMOTE**  
20 **SECURITY AND MODERNIZATION OF VOTING**  
21 **SYSTEMS.**

22 (a) COMMON DATA FORMAT.—The National Insti-  
23 tute of Standards and Technology shall establish and  
24 make publicly available common data format specifications  
25 for auditing, voter registration, and other elements of vot-

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1 ing systems, and provide the specifications to the Tech-  
2 nical Guidelines Development Committee of the Election  
3 Assistance Commission under section 221(e) of the Help  
4 America Vote Act of 2002 (52 U.S.C. 20961(e)).

5 (b) ELECTIONS SYSTEMS CERTIFICATIONS.—The  
6 National Institute of Standards and Technology shall  
7 work in collaboration with the Election Assistance Com-  
8 mission to update the process under which voting systems  
9 are certified pursuant to the Help America Vote Act of  
10 2002 so that State and local election officials will be better  
11 able to carry out updates and otherwise modernize such  
12 systems.

13 (c) TECHNICAL ASSISTANCE.—The Director of the  
14 National Institute of Standards and Technology shall—

15 (1) provide technical assistance to State and  
16 local election officials on the implementation of cy-  
17 bersecurity standards, privacy standards, risk as-  
18 sessments, risk-limiting audits, and technologies  
19 which are incorporated in the voluntary voting sys-  
20 tem guidelines issued under the Help America Vote  
21 Act of 2002; and

22 (2) in collaboration with the Department of  
23 Homeland Security and the Election Assistance  
24 Commission, as appropriate, conduct outreach to  
25 State and local election officials in order to dissemi-

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1 nate best practices for the implementation of such  
2 voluntary voting system guidelines.

3 **SEC. 5. GAO REPORT.**

4 Not later than 18 months after the date of enactment  
5 of this Act, the Comptroller General shall submit a report  
6 to Congress that—

7 (1) addresses the extent to which efforts by the  
8 National Institute of Standards and Technology  
9 (NIST) to assist the Technical Guidelines Develop-  
10 ment Committee of the Election Assistance Commis-  
11 sion in the development of voluntary voting systems  
12 guidelines have resulted in market-ready standard-  
13 ized voting equipment and software, and addresses  
14 the resources made available to NIST to carry out  
15 these activities;

16 (2) addresses efforts by NIST to monitor and  
17 review the performance of laboratories accredited by  
18 the Elections Assistance Commission and to make  
19 recommendations for continuing accreditation, in-  
20 creased voting technology reliability, and the number  
21 of accredited private laboratories, and addresses re-  
22 sources made available to NIST to carry out these  
23 activities; and

24 (3) addresses the extent to which the annual  
25 list of suggestions required to be submitted by NIST

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1 to the Election Assistance Commission for research  
2 issues for grants and pilot programs under section  
3 271(d) of the Help America Vote Act of 2002 (52  
4 U.S.C. 21041) and the evaluation of grants and pro-  
5 grams by NIST has improved voting technology and  
6 been successful in encouraging the implementation  
7 of new technologies in voting systems and equip-  
8 ment.

9 **SEC. 6. AMENDMENTS TO THE HELP AMERICA VOTE ACT**  
10 **OF 2002.**

11 Section 301(b) of the Help America Vote Act of 2002  
12 (52 U.S.C. 21081(b)) is amended—

13 (1) in the matter preceding paragraph (1), by  
14 striking “this section” and inserting “this Act”;

15 (2) by striking “and” at the end of paragraph  
16 (1);

17 (3) by redesignating paragraph (2) as para-  
18 graph (6); and

19 (4) by inserting after paragraph (1) the fol-  
20 lowing new paragraphs:

21 “(2) any other paper or electronic technologies  
22 or processes for collecting, storing, or transmitting  
23 personal information of voters for use in the admin-  
24 istration of elections for Federal office, including  
25 electronic poll books with respect to an election;

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- 1 “(3) voter registration databases and systems,  
2 including online interfaces;  
3 “(4) systems for carrying out post-election au-  
4 diting;  
5 “(5) chain-of-custody procedures; and”

6 **SEC. 7. DEFINITIONS.**

7 In this Act—

- 8 (1) the term “voting system” has the meaning  
9 given such term in section 301(b) of the Help Amer-  
10 ica Vote Act of 2002 (52 U.S.C. 21081(b)), as  
11 amended by section 6; and  
12 (2) the term “State” means each of the several  
13 States, the District of Columbia, the Commonwealth  
14 of Puerto Rico, Guam, American Samoa, the United  
15 States Virgin Islands, and the Commonwealth of the  
16 Northern Mariana Islands.

Chairwoman JOHNSON. Without objection, the bill is considered as read and open to amendment at any point.

I will recognize the bill's sponsor, Ms. Sherrill, to speak on the bill.

Ms. SHERRILL. Thank you, Chairwoman Johnson and Ranking Member Lucas, for holding this markup.

I'm proud to have introduced H.R. 4990, the, quote, *Election Technology Research Act of 2019* with Representative Gonzalez and with the Chairwoman and the Ranking Member.

Election security is a bipartisan concern, and I'm glad that this Committee is working together to address the vulnerabilities with our voting system. In June I chaired an Investigations and Oversight Subcommittee hearing on election security and voting technology vulnerabilities. During the hearing, we heard from voting technology and election administration experts who discussed current U.S. election system technologies and research recommendations made in the 2018 National Academies' report "Securing the Vote: Protecting American Democracy." The Academies' report and the expert input from that hearing informed the development of my legislation, H.R. 4990.

The 2016 elections were a wake-up call to the threats posed by outdated and insecure voting systems, as well as the potential for targeted cyber attacks on technologies that have become essential to our elections. It was clear from the hearing that these issues present opportunities to leverage science and technology to create election systems that are more accessible, reliable, and verifiable. As States take steps to secure voting systems for the 2020 elections, it is critical that we provide additional Federal resources and support for voting and election technology research and standards development.

The *Election Technology Research Act* will make Federal investments at the National Institute of Standards and Technology (NIST) and the National Science Foundation (NSF) to carry out important research to promote the security and modernization of our voting systems. The legislation requires NIST and NSF to each establish Centers of Excellence that will encourage partnerships among universities, private sector election technology vendors, and State and local election officials. NIST expertise in measurement science and statistical analysis and NSF's expertise in fundamental computer science are critical to the security of our elections.

The bill also directs these Federal agencies to provide technical assistance to State and local election officials on implementation of cybersecurity standards, privacy standards, risk assessments, risk-limiting audits, and other approaches to ensuring secure election.

The bill will also amend the *Help America Vote Act*, which hasn't been updated in almost 2 decades, to allow Federal grants to fund not just securing the voting machines but also electronic poll books and voter registration systems. Overall, this bill will ensure that the technical underpinnings of our election architecture are even more solid.

The U.S. has the capacity to build a better election system for the future, but doing so requires the attention from Federal, State, and local governments from election administrators, academia, and industry. It also requires a commitment of appropriate resources.

Our democracy only works if all eligible citizens can participate in elections and be confident that their ballots have been accurately cast and counted. The *Election Technology Research Act of 2019* will help make this possible.

I want to again thank my colleague Representative Gonzalez for joining me in introducing this bipartisan bill. I also would like to thank SST Committee staff, notably Janie Thompson, Dahlia Sokolov, and Brystol English for their work on these issues, and I urge my colleagues to support this bipartisan bill. Thank you, and I yield back.

Chairwoman JOHNSON. Thank you.

Any further recognition desired? Mr. Gonzalez.

Mr. GONZALEZ. Thank you, Madam Chair.

Election security is essential to our democracy, and I'm glad to see the Committee addressing it today in a truly bipartisan manner. My colleague Congresswoman Mikie Sherrill and I have been working together on this issue since being sworn in, and I'm glad to join her, as well as Chairwoman Johnson and Ranking Member Lucas, in introducing this bill.

H.R. 4990, the *Election Technology Research Act*, is a bipartisan approach to addressing election security. The bill modernizes and secures U.S. voting systems by authorizing the National Institute of Standards and Technology, or NIST, and the NSF to conduct research on ways to improve and secure voting systems across the country.

H.R. 4990 provides grant funding to establish a Center of Excellence in election systems, to promote the research and modernization of election practices. This center will foster collaboration between universities, nonprofits, private organizations, and State and local election officials. It will ensure we are using the best technology, research, and ideas at our disposal, and that local voices are heard throughout the process as we work to fight against bad actors and keep our elections safe.

The *Election Technology Research Act* also amends the *Help America Vote Act* to update the definition of voting systems to match modern technology, encompassing electronic poll books and voter registration databases already being used in communities across the country.

There is bipartisan consensus that an update of the voting systems definition is necessary to reflect the modern election technology being used by States today. With new threats facing our electoral systems, it is imperative that we continue to update our election laws and improve our election security by passing bipartisan election security legislation.

Thank you again to the Chairwoman, Ranking Member, and Committee staff for their hard work and for bringing H.R. 4990 before the Committee for consideration today. This bill will update Federal laws to reflect today's technology and encourage innovation on the State and local level to secure our election systems. I urge my colleagues to vote in support of the bill and yield back the remainder of my time.

Chairwoman JOHNSON. Thank you.

Any further requests for time? Ms. Horn.

Ms. HORN. Thank you. I move to strike the last word.

Thank you again to Chairwoman Johnson and Ranking Member Lucas for bringing yet another sensible bipartisan bill, and thank you to my colleagues Ms. Sherrill and Mr. Gonzalez for bringing this important issue to the forefront.

There truly is no issue more important to the fundamental health of our democracy than the security of our elections. Just last week, the heads of government agencies, including the FBI, Department of Justice, and national security agencies warned in a joint security statement that foreign actors, including Russia, China, Iran, and more, would seek interference in the 2020 elections.

I am proud to say that Oklahoma has strong election security, a system based on voter-verified ballots that are impervious to digital interference and maintained for verification in the event of a recount. However, we know that while systems in Oklahoma are strong, there is much work to be done and that cyber threats continue to evolve, so we must make investments in cybersecurity and continuing research so that States and localities can stay one step ahead of the bad actors.

That's why it is critical that our Committee pass today's legislation on the *Election Technology Research Act*, which invests in research and voting system security and integrity and allows our Federal agencies to provide assistance with the implementation of new standards and technologies.

I'm grateful that this conversation and this bill are truly a bipartisan effort, as it should be, and urge my colleagues to join us in passing this step forward in securing our elections. I yield back the balance of my time.

Chairwoman JOHNSON. Thank you. Any further requests for time?

Hearing none, we now will proceed with the amendments in the order on the roster. The first amendment is offered by the gentleman from Florida, Mr. Crist. You're recognized.

Mr. CRIST. Thank you, Madam Chair. I have an amendment at the desk.

Chairwoman JOHNSON. The clerk will report the amendment.

The CLERK. Amendment No. 1, amendment to H.R. 4990 offered by Mr. Crist of Florida.

[The amendment of Mr. Crist follows:]



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**AMENDMENT TO H.R. 4990**  
**OFFERED BY MR. CRIST OF FLORIDA**

Page 3, line 25, strike the semicolon and insert the following: “, including the accessibility of poll book data by voters;”.



Chairwoman JOHNSON. I ask unanimous consent to dispose with the reading. Without objection, so ordered.

I recognize the gentleman for 5 minutes to explain his amend.

Mr. CRIST. Thank you, Madam Chair.

A few months ago I had the pleasure of meeting with one of my constituents Douglas Towne, who lost his eyesight at the young age of 10. Since then, he has dedicated his life to advocating for persons with disabilities, and he now serves as the Chair and CEO of Access Ready, a nonprofit disability rights advocacy organization focused on accessible information technology.

He told me about his work on behalf of visually impaired individuals, including a passion project to make all aspects of voting accessible to all people. Mr. Towne informed me that although there has been an emphasis on making voting machines themselves accessible to individuals with disabilities, that there was a lack of attention being paid to the check-in process at the polls, which were often not accessible to the visually impaired.

While the underlying bill requires voting machines to be accessible to individuals with disabilities, it does not specifically say that poll books, a key component of the check-in process, be similarly accessible. Picture it, when poll books are not offered in accessible formats, poll workers are forced to read personal information aloud in front of other voters and staff in order to complete the check-in process for visually impaired voters. It's an invasion of privacy.

For that reason, my amendment makes it clear that the Centers of Excellence in election systems established by this legislation to study and improve voting systems in our States must also evaluate whether the check-in process at polling locations is accessible to voters, making sure that everyone can participate in the voting process equitably from beginning to end. Accessible poll books, along with accessible buildings and voting machines, will help give individuals with disabilities equal access to the ballot. I think this is something we can all get behind.

I thank Mr. Towne for his advocacy, and I urge my colleagues to support this amendment and yield back the balance of my time.

Chairwoman JOHNSON. Thank you. Any further discussion? No requests for time?

Then the vote occurs on the amendment.

All in favor, say aye.

All opposed, say no.

The ayes have it, and the amendment is agreed to.

Are there any other amendments?

If no, a reporting quorum being present, I move that the Committee on Science, Space, and Technology report H.R. 4990, as amended, to the House with the recommendation that the bill be approved.

Those in favor of the motion will signify by saying aye.

Those opposed, no.

The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table, and I ask unanimous consent that staff be authorized to make any necessary technical and conforming changes to the bill. Without objection, so ordered. Members will have 2 subsequent calendar days in which to submit the supplemental minority or additional views on the measure.