

Calendar No. 652

114TH CONGRESS }
2d Session }

SENATE

{ REPORT
{ 114-364

DEVELOPING INNOVATION AND GROWING
THE INTERNET OF THINGS ACT

R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION

ON

S. 2607



SEPTEMBER, 27, 2016.—Ordered to be printed

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

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SECOND SESSION

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Mr. THUNE, from the Committee on Commerce, Science, and
Transportation, submitted the following

R E P O R T

[To accompany S. 2607]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 2607) to ensure appropriate spectrum planning and interagency coordination to support the Internet of Things, having considered the same, reports favorably thereon with an amendment (in the nature of a substitute) and an amendment to the title and recommends that the bill (as amended) do pass.

PURPOSE OF THE BILL

S. 2607 would take steps to help develop a national strategy to encourage the development of the Internet of Things (IoT).

BACKGROUND AND NEEDS

IoT can be described as the widespread integration and proliferation of Internet-connected devices, such as home appliances, remote sensors, medical devices, and cars. It has been said that IoT brings the physical and digital world *together*.¹ Examples of IoT devices include: subcutaneous body sensors that provide a patient's real-time vital signs to medical providers; applications (“apps”) that allow users' phones to monitor and adjust household functions—from pre-heating an oven to running a bath to controlling smart lightbulbs; smart cities where ubiquitous sensors allow for smoother flow of traffic; and censored roadways, buildings, bridges, and

¹CNET, “Samsung 2015 CES Keynote with co-CEO BK Yoon,” January 4, 2015, at http://live.cnet.com/Event/Samsung_2015_CES_Keynote_with_co-CEO_BK_Yoon?Page=0.

dams that automatically communicate their structural integrity to officials, providing alerts when repairs or upgrades are needed.²

IoT is expected to impact every sector of the economy to varying degrees. Examples include gains in health care through remote monitoring, manufacturing operational efficiency and supply chain tracking, electrical grids via reduction in costly peak usage, traffic management by adjustments in traffic light timing and bus routes, and agriculture through water management, including the ability to track changes in soil moisture, carbon, nitrogen, and soil temperature.³

McKinsey & Company, for one, estimates that IoT could contribute \$2.7 trillion to \$6.2 trillion to the world economy each year by 2025.⁴ Health care applications alone could have an economic impact of \$1.1 trillion to \$2.5 trillion per year by 2025.⁵ Using the McKinsey & Company study as a base, the Progressive Policy Institute estimates the United States could realize one-third of total global IoT economic benefit, raising U.S. gross domestic product by 2 to 5 percent by 2025.⁶ Worldwide, the global market for IoT devices and services is expected to exceed \$7 trillion by 2020.⁷

Estimates of the impact of IoT on the U.S. economy vary, but experts project that it will be substantial. An estimated 50 billion devices are expected to be connected by the year 2020.⁸

Some have argued that to fully realize the potential of IoT, countries should craft a national strategy to promote IoT development and adoption, which the United States has not done. Establishing such a national strategy to encourage the development of IoT has the support of a diverse set of stakeholders, including The App Association, the U.S. Chamber of Commerce, the Competitive Carriers Association, the Consumer Technology Association, Intel, the Information Technology Industry Council, the National Association of Manufacturers, the Tech CEO Council, the Telecommunications Industry Association, and the Semiconductor Industry Association.

SUMMARY OF PROVISIONS

S. 2607, also known as the DIGIT Act, is intended to help create a national strategy for IoT. The bill would require the Secretary of Commerce to convene a working group of Federal agencies, advised by a steering committee of nongovernmental stakeholders established within the Department of Commerce (DOC) to advise the Federal working group, all to provide recommendations to Congress on how to plan and encourage the growth of IoT.

²“The Internet of Things Will Thrive by 2025,” Pew Research Internet Project, May 4, 2015, at <http://www.pewinternet.org/2014/05/14/internet-of-things>.

³McKinsey Global Institute study, “Disruptive technologies: Advances that will transform life, business, and the global economy,” May 2013, pp. 56-58, at http://www.mckinsey.com/insights/business_technology/disruptive_technologies.

⁴Ibid, p. 54.

⁵Michael Mandel, “Progressive Policy Institute, Can the Internet of Everything Bring Back the High-Growth Economy?,” September 2013, at http://www.progressivepolicy.org/wp-content/uploads/2013/09/09.2013-Mandel_Can-the-Internet-of-Everything-Bring-Back-the-High-Growth-Economy-1.pdf.

⁶Ibid.

⁷Molly Wood, “At the International CES, the Internet of Things Hits Home,” *The New York Times*, January 4, 2015, at http://www.nytimes.com/2015/01/05/technology/international-ces-the-internet-of-things-hits-homes.html?_r=1.

⁸Federal Trade Commission Staff Report, “Internet of Things: Privacy & Security in a Connected World, January,” 2015, at <http://www.ftc.gov/system/files/documents/reports/federal-trade-commission-staff-report-november-2013-workshop-entitled-internet-things-privacy/150127iotrpt.pdf>.

The bill is structured so that the nongovernmental steering committee would exist to: (1) advise the working group; and (2) submit a report with recommendations to the working group. The working group, in addition to its own duties and recommendations, would also be required to assess steering committee recommendations and comment on them in the report the working group sends to Congress. The working group would be required to submit its findings and recommendations to Congress within 18 months of the bill's enactment.

The bill also would direct the Federal Communications Commission (FCC), in consultation with the DOC's National Telecommunications and Information Administration (NTIA), to assess the spectrum needs required to support IoT.

LEGISLATIVE HISTORY

On March 24, 2015, the Senate unanimously passed S. Res. 110, introduced by Senators Fischer, Ayotte, Booker, and Schatz, a resolution calling for a national strategy to encourage the development of IoT.

On March 1, 2016, Senators Fischer, Ayotte, Booker, and Schatz introduced the DIGIT Act.

On April 27, 2016, the Committee met in open Executive Session and, by voice vote, ordered the bill to be reported with an amendment (in the nature of a substitute).

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

S. 2607—Developing Innovation and Growing the Internet of Things Act

S. 2607 would direct the Department of Commerce (DOC) to convene a working group of various federal agency representatives and a steering committee of private stakeholders to produce reports and recommendations to the Congress to improve intragovernmental coordination and to encourage the development of the Internet of things. (The Internet of things refers to the growing number of devices that connect to the Internet and interact with one another.) It also would direct the Federal Communications Commission to prepare a report assessing the need for spectrum to support such development.

On the basis of information from DOC and the Federal Trade Commission, CBO estimates that implementing S. 2607 would require about a dozen employees and would cost \$3 million to convene the working group and to develop the reports required under the bill. Those costs would be spread among the federal agencies that would be a part of the working group and such spending would be subject to the availability of appropriated funds.

Enacting S. 2607 would not affect direct spending or revenues; therefore, pay-as-you-go procedures do not apply. CBO estimates that enacting S. 2607 would not increase net direct spending or on-

budget deficits in any of the four consecutive 10-year periods beginning in 2027.

S. 2607 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act and would not affect the budgets of state, local, or tribal governments.

The CBO staff contact for this estimate is Stephen Rabent. The estimate was approved by H. Samuel Papenfuss, Deputy Assistant Director for Budget Analysis.

REGULATORY IMPACT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported

NUMBER OF PERSONS COVERED

The bill does not authorize any new regulations and will not subject any individuals or businesses to new regulations.

ECONOMIC IMPACT

The bill would not have an adverse economic impact on the Nation.

PRIVACY

The bill would not have a negative impact on the personal privacy of individuals.

PAPERWORK

The bill would require three reports from the Federal Government. The first report would be submitted by the steering committee to the working group, 1 year after the date of enactment. The second report would be submitted by the working group to Congress, no later than 18 months after the date of enactment. The third report would require the FCC to submit to the appropriate committees of Congress within 1 year of enactment a report summarizing the comments submitted in response to a notice of inquiry.

CONGRESSIONALLY DIRECTED SPENDING

In compliance with paragraph 4(b) of rule XLIV of the Standing Rules of the Senate, the Committee provides that no provisions contained in the bill, as reported, meet the definition of congressionally directed spending items under the rule.

SECTION-BY-SECTION ANALYSIS

Section 1. Short title.

This section would establish the bill's short title as the "Developing Innovation and Growing the Internet of Things Act" or the "DIGIT Act."

Section 2. Findings; sense of Congress.

This section sets out findings and expresses the sense of Congress that IoT policies should maximize the potential and development of IoT to benefit consumers, businesses, and the government.

Section 3. Definitions.

This section establishes definitions for terms used throughout the Act.

Section 4. Federal working group.

This section would require the Secretary of Commerce to convene a working group of Federal entities to study and make recommendations on various IoT matters. It also establishes a steering committee within the DOC comprised of a wide range of stakeholders outside the Federal Government to make recommendations to the working group.

The Secretary has discretion in forming the working group, but is required to consider seeking representation from the DOC, including from NTIA, the National Institute of Standards and Technology, and the National Oceanic and Atmospheric Administration, as well as from the FCC, the Federal Trade Commission, the National Science Foundation, the Department of Transportation, the Office of Management and Budget, the Department of Homeland Security, and the White House Office of Science and Technology Policy.

The section would require the working group to: (1) identify any Federal regulations, statutes, grant practices, budgetary or jurisdictional challenges, and other sector-specific policies that are inhibiting or could inhibit the development of IoT; (2) consider policies or programs that encourage and improve coordination among Federal agencies with jurisdiction over IoT; (3) consider any findings or recommendations made by the steering committee and, where appropriate, act to implement those recommendations; and (4) examine how Federal agencies use and can benefit from IoT, including preparedness to adopt IoT.

The working group would be required to consult with various nongovernmental stakeholders, including, among others, the steering committee and subject matter experts representing a variety of industry and civil society stakeholders, including small business and rural stakeholders.

The steering committee would advise the working group on: (1) potential regulatory, statutory, grant, programmatic, budgetary, and jurisdictional challenges to development of IoT; (2) spectrum availability to support IoT; (3) policies and programs relating to privacy, security, or coordination among Federal agencies with jurisdiction over IoT; (4) the use of IoT by small businesses; and (5) international proceedings affecting IoT. The steering committee would submit its findings and recommendations to the working group; the working group is required to consider and comment on any recommendations made by the steering committee within 1 year.

The section further provides that the steering committee would be required to set its own agenda in carrying out its duties, but that the working group can suggest topics or items for steering committee consideration. It also states that the steering commit-

tee's report must be the result of the independent judgment of the steering committee. The steering committee would terminate on the date on which the working group submits its report to Congress as required by this section, unless the Secretary of DOC files a new charter for the steering committee.

The working group would be required to submit its findings and recommendations to Congress, along with the steering committee's findings and recommendations, within eighteen months of the bill's enactment.

Section 5. Assessing spectrum needs.

This section would require the FCC, in consultation with NTIA, to issue a notice of inquiry seeking public comment on the current and future spectrum needs of IoT. Specifically, the inquiry would seek comment on the adequacy of available spectrum, what regulatory barriers exist to providing any needed spectrum, as well as the role of licensed and unlicensed spectrum to support the IoT proliferation. The Commission would be required to submit to the appropriate committees of Congress, as defined by the DIGIT Act, within 1 year of enactment a report summarizing the comments submitted in response to the notice of inquiry.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee states that the bill as reported would make no change to existing law.