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INTERNET OF THINGS LEGISLATION

TUESDAY, MAY 22, 2018

House of Representatives

Subcommittee on Digital Commerce and Consumer Protection

Committee on Energy and Commerce

Washington, D.C.

The subcommittee met, pursuant to call, at 10:15 a.m., in Room 2322 Rayburn House Office Building, Hon. Robert Latta [chairman of the subcommittee] presiding.

Members present: Representatives Latta, Burgess, Lance, Guthrie, McKinley, Bilirakis, Mullin, Walters, Costello, Walden (ex officio), Schakowsky, Clarke, Cardenas, Dingell, Matsui, Welch, Kennedy, and Pallone (ex officio).

Staff present: Mike Bloomquist, Deputy Staff Director; Melissa Froelich, Chief Counsel, Digital Commerce and Consumer

Protection; Adam Fromm, Director of Outreach and Coalitions; Ali Fulling, Legislative Clerk, Oversight & Investigations, Digital Commerce and Consumer Protection; Elena Hernandez, Press Secretary; Paul Jackson, Professional Staff, Digital Commerce and Consumer Protection; Bijan Koohmaraie, Counsel, Digital Commerce and Consumer Protection; Austin Stonebraker, Press Assistant; Hamlin Wade, Special Advisor, External Affairs; Greg Zerzan, Counsel, Digital Commerce and Consumer Protection; Michelle Ash, Minority Chief Counsel, Digital Commerce and Consumer Protection; Jeff Carroll, Minority Staff Director; Lisa Goldman, Minority Counsel; Caroline Paris-Behr, Minority Policy Analyst; Michelle Rusk, Minority FTC Detailee; and C.J. Young, Minority Press Secretary.

Mr. Latta. Well, good morning. I'd like to call the Subcommittee on Digital Commerce and Consumer Protection to order and the chair now recognizes himself for five minutes for an opening statement.

And again, good morning to our witnesses and welcome to this legislative hearing on the Internet of Things. Today, we will discuss the bipartisan State of Modern Application, Research, and Trends of IoT Act, or the SMART Act IoT discussion draft.

The SMART IoT Act discussion draft is the result of work the Digital Commerce and Consumer Protection Subcommittee has done over the past two years.

Last July, this subcommittee held an Internet of Things Showcase. At that event, members invited companies from our districts and across America to demonstrate products and services in the IoT field.

It was a wonderful opportunity to see this revolutionary work up close and interact with the inventors doing this important work.

To accompany that Showcase, we held a hearing where participants from the Showcase discussed their companies, challenges they face with growing in this space, and what we, as policymakers, can do to help promote the continued development of the IoT solutions.

This January, we held a hearing on the state of manufacturing

in the IoT space and over the following months we met with other builders, suppliers, customers, and experts to better understand IoT's enormous potential.

This technology is having a real-life impact for many of our constituents. I've personally met with manufacturers in my district that are using this cutting-edge technology to maintain their machinery and keep production on track.

I also met with farmers in Defiance, Ohio, who are using IoT for better grain management, increased planting and harvesting efficiency, and improved monitoring of the temperature in their storage facilities.

The draft legislation we discuss today is the result of important bipartisan work after hearing from the experts where we noticed one lingering question: What does the universe of rules, regulations, guidelines, and best practices look like for the IoT space?

While we know there are many other topics of interest in this space, this legislation kicks off a process to give all stakeholders a base set of information to frame the other challenges without speculating or hypothesizing about what already exists.

The IoT is already revolutionizing the way that we organize factories and supply chains, transport commodities like oil and gas, make manufacturing more efficient, maximize energy

efficiency, and even restock our refrigerators.

This subcommittee has engaged in historic bipartisan work with the SELF DRIVE Act this Congress and I am pleased to see that cooperation continue with the SMART IoT.

When safely applied to autonomous vehicles, the Internet of Things holds the potential to significantly reduce traffic fatalities and make our roads safer while reducing costs through more efficient fuel consumption.

In these areas and more, the IoT holds the potential to greatly improve the lives of Americans. I want to thank my colleague, Representative Welch, for his willingness to continue our work together on this very important issue.

As many here know, in previous Congresses Representative Welch and I started the Internet of Things Working Group. We heard from industry and other stakeholders about the importance of light-touch regulation to foster innovation and jobs here in the United States.

This bipartisan draft is a result of the lessons learned in those meetings, this subcommittee's Disrupter Series hearings, and lays the groundwork for constructive conversations in the future.

The SMART IoT Act will give all stakeholders, both private in industry and at the federal level, a better sense of what guidelines and best practices exist or are in development.

As we all know, IoT issues cut across so many industries and so many federal agencies. Ensuring that we know about overlaps or potential duplication is important for many reasons from ensuring efficient use of government resources to understanding how stakeholders are addressing some of the important but challenging issues of privacy and data security.

From the Department of Commerce's efforts to foster the advancement of the IoT ecosystem to the Department of Transportation's focus on advancing automated vehicle, so much work is being done in this space.

We want to encourage our interagency collaboration and foster an environment where transparency is key. Likewise, I would like to ensure that the environment for innovation in the United States across all of these industries remains a priority by optimizing our own efforts to promote good, consistent government.

I believe the SMART IoT Act is an important step in doing just that.

And again, one of the things I always like to say is that one of the great things about serving on the Energy and Commerce Committee is that we kind of look over the horizon five to 10 years.

When we hear from our witnesses we want to hear from you to know exactly where you're going to be because we don't want

to have our regulators or our laws that we were thinking about enacting looking in the rear view mirror or at the end of a car. We need to be looking far out into the future.

So, again, I want to thank our witnesses for being with us today and I look forward to your testimony today and, with that, I recognize the gentlelady from Illinois, the ranking member of the subcommittee, for five minutes for an opening statement.

Ms. Schakowsky. Thank you, Mr. Chairman.

This subcommittee frequently discusses the Internet of Things. We have hearings on IoT in manufacturing and wearable devices, not mention our IoT showcase last summer.

Today, we transition from general discussion to discussion of actual legislation. The SMART IoT Act is a first step. It would require the Commerce Department to survey the use of connected devices and examine the federal role in this space.

As the bill acknowledged, internet-connected devices provide an opportunity for economic growth. But we want to ensure that those devices are developed securely. My hope is that the report generated by the SMART IoT Act provides the foundation for further legislative efforts.

Our hearings on the Internet of Things have raised important issues. What privacy and cybersecurity protections are going to be baked into these devices?

Normal household items can now collect very personal data

that must be stored and used appropriately. Connected devices present new safety concerns. The Consumer Product Safety Commission just held a public hearing on IoT and safety last week with stakeholders on that very subject.

We need the infrastructure to support the rise of connected devices including affordable broadband. The Internet of Things could also disrupt the current labor market. We must ensure workers are prepared for a changing economy.

Finally, we must make the strategic investments in research to promote future innovation.

Last week's hearing on quantum computing made clear that the United States is not providing the consistent support necessary to keep groundbreaking research moving forward.

Standing on the sidelines is simply not an option. These are big issues for Congress to tackle and we must rise to the challenge.

We know what happens if we rely on industry self-regulation. Consumer privacy goes unprotected and safety is put at risk. The SMART IoT Act should provide a resource for us to better understand the variety of devices on the market.

I plan to use this information as I continue my push for comprehensive consumer privacy and data security legislation. We have had bipartisan furor over misuses of consumer data.

It's time now for bipartisan solutions to the problem. The

bill before us is a natural extension of the work that members of the subcommittee have been doing for the last couple of sessions.

In 2016, Congressmen Latta and Welch convened stakeholders for several forums under their IoT Working Group to discuss this -- the internet -- the Internet of Things and the issues new -- that new technology raise.

In many ways, the study and the SMART IoT Act is a formalization of that very survey. In the coming weeks, I look forward to working on a bipartisan basis to move this legislation forward, and then I am ready to take the next step of updating consumer protections and funding key investments.

The Internet of Things has tremendous potential. We must work together to make sure that America benefits from that opportunity.

I thank you, Chairman Latta. I yield back, unless anybody wants the remaining time.

I yield back.

Mr. Latta. Thank you. The gentlelady yields back.

The chair now recognizes the gentleman from Oregon, the chairman of the full committee for five minutes.

The Chairman. Good morning, Mr. Chairman, and other members on the committee and to our panelists -- witnesses on the panel. Thank you for being here.

Today, we will hear testimony about the draft bill, the SMART IoT Act, to support the development of the Internet of Things here in the United States.

This bipartisan effort underscores one of the key goals of the Energy and Commerce Committee, and that is helping American entrepreneurs and established businesses expand to create jobs for American workers and help improve the lives of American consumers.

So I would like to thank Chairman Latta and Representative Welch for working on this issue and finding a bipartisan path forward. This is what we do at the Energy and Commerce Committee, particularly on this subcommittee when faced with new technology policy questions.

We have done that on the Self Drive Act. I would commend my colleagues on both sides of the aisle for the good work there. Now we just need to get the Senate to move forward, as we are won't to do in many cases.

The Internet of Things, or IoT, does hold great promise to connect workers, suppliers, products, consumers throughout efficient networks that can save time, money, and bring about new innovation and resources.

Building this network won't be easy. We know that. It requires engineers, entrepreneurs, and visionaries. It also requires public policies that foresee a world designed for the

next-century policies that foresee a world designed for the next century policies that are forward looking and that reflect a world to come of self-driving cars, self-organizing materials, and innovations we have yet to even think of.

These must replace many of our still-existing rules and policies that reflect the old technologies of the last century. While America has changed, many of our regulations, unfortunately, have not.

That is one of the purposes of this legislation that's before us today. It is meant to set the stage by making sure stakeholders are aware of the playing field and are not creating conflicting or duplicative obligations or requirements.

So the SMART IoT Act will create the first compendium of essentially who is doing what in the IoT space. This includes the efforts undertaken by private industry as well as a review of what agencies are doing.

Removing regulatory barriers to innovation is one of the most important duties of this committee. Doing so allows our economy to grow, our workers to flourish, and innovation to occur here in the United States.

The best way to start is to know what is out there already or being developed today. It's important to note that since January of 2017 more than three million new jobs have been created in America.

The U.S. unemployment rate, now at 3.9 percent, is the lowest seen in this country since the year 2000, and what's more, this comes as more Americans rejoin the workforce, millions once again finding work after years of hardship.

So creating jobs and opportunity is a goal shared by all of us on this committee, in fact, reflected in the bipartisan work on the SMART IoT Act.

Chairman Latta and Representative Welch have been working on these issues for several years now. Glad to see that this progress has been made and we have a great opportunity, going forward, to do even more.

So, Mr. Chairman and members of both sides of the aisle, thanks for your good work on this. We have a couple hearings going on simultaneously, as I am sure our witnesses and members know.

So some of us will be popping back and forth. But we value your testimony that we have here and the good bipartisan work.

And with that, I yield back the remaining balance of my time.

Mr. Latta. Well, thank you very much. The gentleman yields back, and the chair now recognizes the gentleman from New Jersey, the ranking member of the full committee for five minutes.

Mr. Pallone. Thank you, Mr. Chairman.

Today's hearing on the draft SMART Internet of Things Act is the next step in this subcommittee's review of new and evolving

technological development and I commend Chairman Latta and Representative Welch for working together over the last several years to explore and learn how the Internet of Things, or IoT, can enrich our lives, help us be more efficient, and grow the U.S. economy.

Today, more and more people have multiple internet-connected devices in their homes, things like thermostats, vacuums, and digital personal assistants, and more and more people are wearing internet-connected devices such as fitness trackers.

But IoT is not limited to consumer products. Connected devices of all kinds are used in practically every industry sector like manufacturing, agriculture, and medicine.

We have learned about drones that fly into dangerous areas to assess hazards, sensors helping farmers understand the topography acidity of their land, and doctors receiving real-time data from monitors so that patients in remote areas do not have to travel for daily appointments.

And today we are considering a bipartisan draft bill that would direct the Department of Commerce to conduct a comprehensive study and report on the Internet of Things.

Commerce will survey the industry sectors that make internet-connected devices as well as all industry sectors that use those devices.

The study will also look at how the federal government

oversees the use and development of connected devices, which agencies deal with the Internet of Things, what expertise those agencies have, and what entities those agencies interact with, and the study will identify government resources available to consumers and small businesses to help them evaluate connected devices.

The report will provide a one-stop source of how businesses are integrating connectivity and how the federal government is helping the country adapt to this age of connectivity.

Federal and local government agencies could also use the report to better coordinate their work and I hope the study will encourage them to do so.

And any report will be a snapshot in time, but given the integration of IoT into all parts of our lives in the global economy, the report will provide a jumping-off point for more work.

I would certainly like to see cybersecurity issues given more emphasis when we look at IoT. Throughout our review, cybersecurity was the issue that came up most often. cybersecurity is imperative to keeping ourselves and our country safe from malicious actors.

And I know some stakeholders have asked that cybersecurity be specifically called out in the study. I would support such a change.

But whether it's made part of the study required by this bill or not, Congress must take action to ensure that strong cybersecurity and data security are fundamental to IoT.

So I am glad that this subcommittee is working on this bipartisan legislation and I'd like to yield the balance of my time to the sponsor, Congressman Welch.

Mr. Welch. Thank you very much, and I want to thank Chairman Latta and Ranking Member Schakowsky for this hearing. It was great to work with Mr. Latta too in the IoT Working Group -- 21 members that had hearings in advance.

We are trying to get educated before we pass legislation, which isn't necessarily how we usually operate. But this is a huge opportunity with the Internet of Things. You know, McKinsey and Company did a study and says that it can be between $4 and $11 trillion annually by 2025. So that's really quite extraordinary.

My colleagues have already spoken about what many of these opportunities are and also, Ranking Member Schakowsky, I think pointing out some of the implications that we have to contend with with labor is really, really important for all of us to keep in mind.

But I'll just give one example. In Vermont, the brutal pressure on our dairy farmers right now -- the price is down, the costs are up -- and technology is helping some of those farmers

hang on.

And Mangan Brothers, a dairy farm in East Fairfield, Vermont, has a computerized internet-based milking system that's really been helpful to them.

They installed a milking parlor about two decades ago and now what happens when the cow comes in they have a pedometer on their leg, and as soon as the cow crosses the threshold of the milking parlor the sensor picks up which cow it is and relays the information to the computer and all the statistics about the cow's movements and body temperature and other pertinent information is sent to the computer, and it's even relevant for when the breedings are done just based on activity spikes.

It also gives them a report at the end of every milking day with respect to the salt content and that's an indicator that allows the farmers to take steps to avoid diseases.

So it's a big deal in terms of productivity for them and it is made possible by the Internet of Things. And just the last point in my last few seconds, the only way we are going to have the Internet of Things in rural America is to have broadband in rural America, and that's another enormous challenge we have and it's woefully under served.

So we can talk all we want about the Internet of Things, but unless we have broadband it's not going to happen.

So I yield back and thank my colleagues for the time.

Mr. Latta. The gentleman yields back, and I just want to say just briefly I really appreciate all the work that you and I have done on IoT and also not only chairing the working group but also working together chairing the rural broadband, so I appreciate all you've been doing and thank you very much.

That now concludes members' opening statements and the chair now reminds members that pursuant to committee rules, all members opening statements will be made part of the record.

And, again, I want to thank all of our witnesses for being with us today. We greatly appreciate you taking the time to testify before the subcommittee.

Today's witnesses will have the opportunity to give five-minute statements followed by a round of questions from our members.

Our witness panel for today's hearing will include Mr. Tim Day, the senior vice president of the Chamber Technology Engagement Center at the U.S. Chamber of Commerce, Ms. Michelle Richardson, deputy director of the Freedom Security and Technology Project at the Center for Democracy and Technology, and Dipti Vachani, vice president of the Internet of Things Group and general manager of the Strategy and Solutions Engineering Division at Intel.

And, again, I want to thank you all for being here today and Mr. Day, you are recognized for five minutes. If you'd just

pull that mic up close and turn the mic on, the microphone is yours.

STATEMENTS OF TIM DAY, SENIOR VICE PRESIDENT, CHAMBER TECHNOLOGY ENGAGEMENT CENTER, U.S. CHAMBER OF COMMERCE; MICHELLE RICHARDSON, DEPUTY DIRECTOR, FREEDOM, SECURITY, AND TECHNOLOGY PROJECT, CENTER FOR DEMOCRACY AND TECHNOLOGY; DIPTI VACHANI, VICE PRESIDENT, INTERNET OF THINGS GROUP, GENERAL MANAGER, PLATFORM MANAGEMENT AND CUSTOMER ENGINEERING, INTEL CORPORATION

STATEMENT OF MR. DAY

Mr. Day. Thank you very much.

Good morning, Chairman Latta, Ranking Member Schakowsky, and distinguished members of the House Subcommittee of Digital Commerce and Consumer Protection.

Thank you for the opportunity today to testify about the Internet of Things. I am Tim Day, senior vice president of the Chamber's Technology Engagement Center, or C_TEC.

The Chamber established C_TEC three years ago to tell the story of how technology can empower all Americans. At C_TEC, we have focused our work on autonomous vehicles, unmanned aircraft, telecommunications, and the new economy.

All of these issues and technologies are connected and supported by the Internet of Things. Everyone participating in this hearing today is in one way or another one of the nearly 11 billion internet-connected devices projected by Gartner to be in use today worldwide.

Whether we are streaming this hearing on a smart phone, whether or not we have asked Amazon, Alexa, or Google Home directions to the Rayburn House Office Building, or a wearable counted the number of steps it took to get here, we all have been connected and our lives are being improved by the Internet of Things.

Not only does IoT technology directly benefit consumers, it is also making businesses smarter and more efficient. For example, the agricultural sector for better crop yields, health care for improved patient outcomes, and manufacturing for improved operations and maintenance.

One study has shown that industrial manufacturing IoT spending is predicted to increase to $890 billion worldwide by 2020. And, of course, government also stands to benefit from IoT by creating efficiencies in public services, by finding new value for citizens, enhancing capabilities, and streamlining processes.

IoT may provide a much-needed answer for agencies seeking to meet increasing citizen needs with decreasing budgets.

And, Chairman Latta, back home in the Buckeye State, Columbus, which was awarded the DoT's 2016 Smart Cities Challenge Grant, is using IoT in research and development to create smart vehicle technologies.

Another study has shown that wireless providers will invest

$275 billion towards building 5G networks, which will be part of the connectivity backbone of smart cities and IoT.

This investment will add $500 billion in GDP and 3 million jobs to the American economy. This number pales in comparison to the $11 trillion worldwide economic impact that is predicted by 2025 for IoT.

Needless to say, IoT is an economic game changer. The Chamber's president and CEO, Tom Donohue, has stated that technology must be embraced as the growth driver and game changer that it is.

That is why it is so critical that the United States maintain leadership in IoT by adopting the right regulatory framework.

I would like to suggest a couple of ideas for your consideration to strike the correct regulatory balance. Congress and agencies should do more to reduce the regulatory burdens, compliance costs, and overlap.

Government should evaluate existing regulatory activities and bring together stakeholders in government industry to shape IoT policy.

Legislation like the DIGIT Act and the draft legislation today, the SMART IoT Act, are much-needed steps in the right direction to achieve this goal.

Additionally, actions like those done by the FCC led by

Commissioner Carr to streamline communications siting rules are also to be praised. As IoT is still in its infancy, policymakers should avoid the temptation to impose prescriptive regulations on IoT and single out IoT for regulation for issues such as privacy.

Congress should continue a policy of technology neutrality and, finally, a skilled workforce will also be critical to the development of this new technology and investment in human capital will determine which countries lead, going forward in this space.

We are currently witnessing a new industrial revolution led by advanced technology including IoT, which is a force for good that should be fostered by smart regulatory frameworks that encourage investment, promote innovation, as well as connect and empower all Americans.

Thank you for this opportunity. I look forward to your questions.

[The prepared statement of Mr. Day follows:]

**********INSERT 1**********

Mr. Latta. Thank you very much for your testimony.

Ms. Richardson, you are recognized for five minutes.

STATEMENT OF MS. RICHARDSON

Ms. Richardson. Chairman Latta, Ranking Member Schakowsky, thank you for the opportunity to testify today on behalf of the Center for Democracy and Technology.

CDT is a nonprofit technology policy organization dedicated to protecting civil liberties and human rights in a digital world including privacy, free speech, and access to information.

We believe the Internet of Things has the power to enrich people's lives in ways both big and small. But we also recognize that the Internet of Things poses unique privacy and security challenges.

Many of these devices collect information that is intensely personal yet ungoverned by U.S. policy and privacy law. It has also become common to hear of serious security breaches which have allowed hackers to use IoT devices to either steal information or participate as part of a botnet.

CDT's preference for technology policy is for private industry to voluntarily create and adopt standards. The government plays an important role in setting standards and incentivizing good behavior, especially in sectors where security failures had extreme consequences or in the consumer market when users don't have a fair shot at understanding or managing products.

Congress has the authority and the responsibility to determine whether the current government and private balance is the right one. We hope this bill will help collect information to assess that in two ways.

First, we hope the SMART IoT Act will collect information to determine whether voluntary standards and privacy standards are not only being created whether they are being adopted by a critical mass of industry players.

Voluntary standards are the default in the IoT space and billions of devices are up and operating on the internet, and more are coming.

The foundational question we should be asking is whether this approach is working as a general matter.

Second, the study should tease out any overlap or gaps in government oversight of these IoT devices. Cross-agency coordination is crucial to sharing information and will help make sure that the government is not issuing conflicting guidance or requirements.

Now, we recommend the bill clearly state that nothing in it should be interpreted to discourage agencies from continuing work in critical areas like connected cars or health devices.

Agencies like the FDA and NHTSA are driving standards for devices or systems that have literal life or death consequences and that work cannot wait.

While industry deserves an overarching government plan for IoT, IoT is already too large and too diverse to cabin in a single agency, and developing sector-specific expertise will ensure that government involvement is supported by the technical and policy knowledge needed to make the right decisions.

After you receive this report, we expect that you will find that one of the largest gaps in standards and oversight is in the consumer market.

As Ms. Vachani mentions in the IoT report for Intel, most IoT devices and applications relate to industrial products, smart cities, and the health industry.

Many of these devices are subject to practical and regulatory limits already. For example, some of these devices are embedded in critical infrastructure, which is already regulated writ large, and some of these devices are really quite simple and do not collect personal information or offer computing power that makes them attractive hacking targets. Think of sensors that only measure water pressure or county the number of cars that pass through an intersection.

The users of these sorts of devices also are often more sophisticated and the corporate versus corporate relationship can contractually ensure that IoT devices continue to work safely.

But the consumer ecosystem does not have many of these checks and balances. Consumers are stuck in a take it or leave it system

and they will not have the option to leave it much longer, as connectivity is built into everything.

Lay users just do not have the technical capacity to understand and control the current crop of IoT devices on the market. They also have few legal remedies when something does go wrong.

If security fails, devices can be a gateway to stealing personal information or subject the owner to actual spying. Failures can harm a person or her property in the real world like smart locks that can remotely open front doors.

And these devices can be taken over as part of a botnet that can send scam email or, in the case of the Mirai botnet, take down websites and internet access, more generally.

In other words, there's a lot at stake in the consumer market and the current system is just not working. We are hoping that this committee finds the report to be just the jumping off point for better oversight of consumer products and we look forward to working with you and your staff on this bill.

[The prepared statement of Ms. Richardson follows:]

**********INSERT 2**********

Mr. Latta. Well, thank you very much for your testimony.

Ms. Vachani, you are recognized for five minutes.

STATEMENT OF MS. VACHANI

Ms. Vachani. Thank you.

Thank you, Mr. Chairman, Ranking Member Schakowsky, and members of the subcommittee.

I appreciate the opportunity to testify today on behalf of Intel Corporation and I commend you and Congressman Welch for your leadership on the SMART IoT Act.

First, I would like to turn to the vast benefits of the IoT and discuss real-life IoT use cases that are relevant to the committee's jurisdiction.

Gartner predicts that IoT technology will be in 95 percent of electronics for new product design by 2020. The transformational, societal, and economic benefits that will flow from this broad deployment of IoT technology is what energizes Intel.

And the SMART IoT Act is a welcome indication that this enthusiasm is matched by this subcommittee. The IoT is already transforming sectors like health care, smart cities, and transportation.

I would like to go over a few use cases. Smart health care -- less than .01 percent of patient data is available beyond the bedside for health care teams to make clinical decisions.

To solve this problem, Medical Informatics, Intel, and Dell

partnered on an FDA-cleared IoT platform called Sickbay. Sickbay continuously captures patient data from the bedside medical devices and transforms it into actionable intelligence.

This enables care teams to make better and fast decisions and predict patient deterioration before it occurs. In the last four and a half years, Texas Children's Hospital used Sickbay to improve health care for 2.1 million patients.

Smart cities -- 92 percent of the world's population lacks access to clean air and leading to millions of deaths annually. To address this, Intel and Bosch developed IoT-powered pollution monitoring systems that provide intelligent data and enable real-time analysis.

These IoT systems are used by governments to improve air quality in congested cities like Pune, India, by factory owners to track emissions and provide safety checks for all workers, by construction site managers to provide air quality warnings and improve efficiency, and by cities to provide residents with recommended times for exercising outdoors.

Use case number three, transportation -- as the subcommittee is aware, the impact of autonomous vehicles will be life changing, particularly in our disabled community and aging population.

The number of U.S. residents aged 78 and older will increase by 53.7 million by 2030, compared to just 30.9 million in 2014.

Many of these residents live in communities with poor or

no public transportation. AVs will offer vastly improved mobility benefits. Intel applauds the committee's leadership on AV.

Next, I would like to offer Intel's strong support for the SMART IoT Act and respectfully offer recommendations to enhance the legislation.

Nations are racing to lead in this competitive IoT sector. It has been Intel's strong desire that the federal government be more proactive in ensuring U.S. IoT leadership in declaring the U.S. the IoT a national priority for the innovation in investment and competitiveness.

We applaud the subcommittee for its bipartisan work to set America on its leadership path by ensuring an IoT study and recommendations to promote IoT adoptions to grow our economy.

I was on the Hill last October to unveil a broadly supported industry report on IoT. Intel recommendations to the IoT -- SMART IoT reflect this report.

First, we urge the subcommittee to include a robust definition in IoT that is nonproprietary, neutral regarding technologies and applications, and contemplates both the consumer and the industrial IoT.

In fact, industrial, smart city, and connected health will make up 70 percent of the use cases.

Second, we urge IoT -- you to seek specific recommendations

that would be highly impactful on laying the groundwork for the national IoT strategy. This includes recommendations on incentives for the federal government and agencies to adopt IoT technologies to advance their federal mission including smart infrastructure solutions.

How the federal government can best support global industry-led IoT standard efforts and avoid new regulations that duplicate existing industry standards and a criteria for the federal government to invest in IoT public-private partnerships and testbeds.

Thank you for the opportunity to share Intel's thoughts on the SMART IoT Act. We look forward to working with you to see this bipartisan bill enacted into law -- that first step towards a national IoT strategy -- and ensure U.S. leadership in this transformational sector.

[The prepared statement of Ms. Vachani follows:]

**********INSERT 3**********

Mr. Latta. Well, again, I want to thank our witnesses for being with us today. We really appreciate your testimony, and that will conclude our testimony from our witnesses and we'll begin our questioning from our members, and I will recognize myself for five minutes.

Mr. Day, do you believe a compendium of all current federal action on IoT-related issues will help promote interagency collaboration and consistent federal action?

Mr. Day. Thank you, Mr. Chairman, and again, I think what we've heard is that the Internet of Things holds incredible promise for our economy and the quality of life for citizens.

I do. I think the draft that we have before us today helps with increased transparency and how government regulates this technology in a better way.

We are firm believers that the government should make data available and complying a list of federal policies that affect IoT, I believe, would go a long way in enabling the companies that we are working with at the Chamber and others and especially also small and startup companies to understand the regulatory environment that we are faced with today.

Mr. Latta. Yes, let me ask you about that right there because I know that when my friend from Vermont and I were doing our Working Group meetings -- and actually we had them right here in this room -- it didn't make any difference if you're from the

East Coast, the West Coast, the Midwest, what type you're in, as Ms. Vachani was talking about, from everything from health care to manufacturing to FinTech, you name it.

There was one thing that we heard from everyone -- that we needed to make sure that we have a soft touch regulation out there so people can be out there innovating and it's no -- we didn't hear anybody ever say that they were against regulations but not to have anything that was over burdensome that they couldn't go out and regulate.

When you're talking about these smaller companies out there, could you talk to me or talk to the committee a little bit about what you have heard from them some of the major hurdles that they're facing right now or things that need to be overcome?

Mr. Day. Absolutely, and, you know, I think what's exciting about this is that this does impact middle America, the coasts. Everyone, as you said, is impacted by this and I think when you're a small business and a startup, and my focus at the U.S. Chamber of Commerce in the emerging technology space, it is just that. It's emerging. It's changing by the day.

We are still learning what the technology means and so I think there needs to be a structure but not too prescriptive in the approach and, you know, quite frankly, business leaders and new startups and entrepreneurs are looking to run the -- their businesses with the support of the government but not being told

exactly how to do it because we are still working on the benefits and how this actually applies to, you know, the companies that we are working with.

And so I think what business leaders want to know is give me the ability to invest, to be able to take my idea to the next step but don't, you know, regulate me so much that I am not able to produce quality results and in the end be successful as a startup.

Mr. Latta. Thank you.

Ms. Vachani, again, I would like to turn a question to you now. What are some of the IoT applications that Intel is focussed on and can you explain how those applications benefit the economy and jobs?

And, again, I was very interested because I know you were going through the health care, the manufacturing, the transportation, and construction, but if you could get a little bit more in depth with that I would appreciate it.

Ms. Vachani. Absolutely. So we have -- gosh, we have over 500 market-ready solutions that we work with the industry to create because one of the things -- the common misconceptions about IoT it's vertical, right.

You have a retail solution and you have an industrial solution, and honestly, when you look across the board, our customers are looking at solutions that go across multiple

industries.

And so there are multi industry solutions. They don't necessarily sit in one nice little box as a vertical, and so you will see an industrial environment where they're -- where they're trying to do predictive maintenance at the same time as inventory management, the same time as building management, and you see several different vertical like solutions coming together into one application.

And we believe that the maximum benefit is when these solutions start to come together. One of the areas that I want to reflect on is that the U.S. is actually a leader worldwide in our innovation that we have in IoT.

So you will see solutions overseas that have Intel or other companies within the United States technology, our AI applications, our software, that are driving innovation around the world, and that's expanding our economy just the same because that's created here in the United States.

It's built here by us and by our companies that are innovating at a faster rate.

Mr. Latta. In my last 24 seconds follow up with that because, again, it's good to hear the United States is leading on this. What's happening across the globe that is making the United States be the innovator out there?

Ms. Vachani. Well, I think that what we come down to is

we have some companies here that are able to look at these solutions like Intel, truly, and that goes from the data center all the way to the thing.

And so we can look at this problem holistically and that's important that we do that, as well as some of the new technologies that we come up with with specifically integrated circuits as well as the software and artificial intelligence and the leadership in artificial intelligence within this country.

Mr. Latta. Well, thank you very much. My time has expired and I yield back, and I recognize the gentlelady from Illinois, the ranking member of the subcommittee, for five minutes.

Ms. Schakowsky. Thank you.

Connected devices can follow us through every aspect of our lives, collecting data. At the same time, the committee has spent a lot of time looking at how the data collected about us is used by companies and by the government.

We heard from Facebook about how much data it collects, how it shared that data with third parties, and how it used our data to sell advertising.

As more and more devices collect data about us, that data can be used to affect our decision making.

So, Ms. Richardson, let me ask you some questions. While IoT devices provide benefits, are you concerned about their data collection?

Ms. Richardson. Absolutely. The way the U.S. works its privacy law is to do it categorically, to cover, for example, communications, financial data, health information held by doctors, and if you don't fall into one of these categories you're just not protected and there are very few, if any, limits on how the information can be collected and used.

It's going to be possible that a lot of these IoT devices are going to collect data that is not covered by one of these categories already and that would be one of the benefits of having a baseline comprehensive privacy law in the United States as we would not have so many cracks and you would see the IoT data have some procedural rights for Americans.

Ms. Schakowsky. I would like to work with you on that.

Five years ago, we were barely talking about location data or facial recognition and now we are talking about genetic information also.

Ms. Richardson, should we be concerned about what personal information is out there and how the kinds of personal information available to collect change over time?

Ms. Richardson. Yes. The information that is collected by these devices is really unique. You only have to go back a few years before we widely collected things, like you mentioned, that reflect, let's say, your heartbeat, your location, the food you eat, where you go, the people you know, and it can all be

aggregated in ways that give a very rich picture about people in ways that they might be shocked to know.

I think one of the things you saw at your hearing with Facebook is that the surprise factor is really what upsets people in many ways.

So this is something we need to watch more closely and, hopefully, a universal privacy law would be able to protect that sort of really sensitive information right now.

Ms. Schakowsky. So it's clear that privacy legislation is absolutely necessary. I like the way you talk about it in a nonsiloed way.

In fact, the Federal Trade Commission has recommended many times that Congress enact comprehensive privacy legislation.

Ms. Richardson, again, the SMART IoT Act would examine how different industries are using and developing IoT. Could such a resource be helpful in the development of best practices for privacy and IoT devices?

Ms. Richardson. Yes. I think that would help us get a better view of where the industry is going. I think you're going to find, though, that there are very few when it comes to privacy and for the most part the standards are about interoperability, technical standards, and cybersecurity, and you're going to find a really big gap here.

Ms. Schakowsky. So the FTC recommended in the past that

privacy legislation should not be IoT specific. Do you agree with that?

Ms. Richardson. Absolutely. We want a forward-looking tech-neutral law that will be able to cover all sorts of information regardless of the type of device or entity that's creating it.

Ms. Schakowsky. So Mr. Day said that one of the things that we need to worry about is too much regulation standing in the way. Don't you think there's a balance, though, of making sure that we set some rules of the road, some guidelines that industry needs to follow?

Ms. Richardson. Yes, and in a way those can drive innovations themselves. You end up having requirements that inspire new solutions to protect privacy and security.

And CDT does believe in a light touch but there are a few places that government intervention -- or oversight is maybe a better word -- is most urgent and that's where you look at things like cars or pacemakers and devices that really have life or death consequences if something goes wrong, and I think we are seeing the consumer market is just an area where everyday people are not able to make informed decisions about the devices they're buying, the information that's collected and then how to secure the devices.

Mr. Latta. Thank you. The gentlelady yields back.

The chair now recognizes the gentleman from Pennsylvania for five minutes.

Mr. Costello. Thank you, Mr. Chair.

I want to sort of continue down that path of consumer-facing devices and speak a little bit more about being a small business owner or a startup, and approaching the infrastructure purchase questions from an adequate security measure perspective.

In what direction do we need to head -- and it may not be necessarily government, it may just be more industry -- in what direction do we have to head in order to make sure that we are getting it right.

A rather open-ended question, but why don't I start with you, Ms. Richardson?

Ms. Richardson. As far as security standards go, we have endorsed tech-neutral cybersecurity controls. So these are really top-level decisions that both the manufacturers and the operators can make.

So, for example, when you're building a device you should always have the capacity to update the software, right, and you could say that without getting a really prescriptive technology, you know, description of how to do that and each company can decide how to do that.

And there is a list of maybe a half dozen of these sorts of practices that I think are reasonably set as the baseline and

they include other things like being able to have passwords or other authenticators that can be changed and things like that.

Mr. Costello. Following through on that, steps or approaches that small and medium enterprises can utilize to overcome concerns or difficulties relating to the system integration side of IoT solutions, to -- go ahead.

Ms. Richardson. Can you repeat the question about system integration?

Mr. Costello. Small and medium enterprises, overcoming their concerns or difficulties relating to system integration of IoT solutions. If you -- look, I don't want to -- if you're a really big company, integrating is very easy. If you're a small --

Ms. Richardson. Not actually. It's actually difficult either way.

Honestly, the number-one challenge for IoT right now is scale. Scale is very difficult, right, and even with a company as large as, you would say, Intel, there -- if you look at our market-ready solutions, rarely do we have a solution that only involves Intel. There is others. There's Dell involved -- as I mentioned, many of our solutions -- Bosch was involved.

And so you're talking about multiple companies coming together to include a complete solution and for a small or medium-sized company that gets even more difficult, right.

And this is where the industry standards come into play because when we start to create standards that are interoperable and that we know work together that a small or medium-sized company can create a piece and we know that that piece will work with the rest of the system.

And Intel and many other companies -- we were here with Samsung -- are working across the industry to help those standards get deployed and become more consistent interoperable.

Mr. Costello. So when you use the term scale there, what are you saying?

Ms. Richardson. What I mean by scale there is we are able to create -- I will give you an example. We'll create a proof of concept inside of the walls of Intel in our building and it will look beautiful and work perfectly.

It'll have the in system, the data center. It'll have the store, let's say. It'll do inventory management. As soon as I take that out of my office inside of Intel and try to put into a Levi store or I try to put it inside of a mall, now it's working with everything else around it and that's when we struggle, because there's other systems.

There's old data. There's new data. Maybe the infrastructure is there. Maybe they have connectivity. Maybe they don't.

And so that becomes more difficult for us to deploy and then

think about thousands and then add millions to that, right. And that's where we struggle with being able to take that technology and deploy it into multiple instances across the world.

Mr. Costello. That's helpful. You were speaking about industry standards, and depending upon what industry we are talking about -- health care, manufacturing, whatever it may be -- the place that you go for that industry standard to make its way into code or regulation or whatever the case may be is oftentimes different.

Share with me challenges or frustrations in navigating federal regulatory agencies to determine IoT industry standards and how we could go about improving that.

Ms. Richardson. Well, one, I would encourage --

Mr. Costello. That's a question for everyone.

Ms. Richardson. Yes. I can start. One, I would encourage you to look at the industry standards that are already available to us because the industry is starting to coalesce around a few standards that go across multiple industries.

Again, we are not saying this is just for industrial or environment or it's just for retail. This is how we collect data across the board and that could be a standard.

So I would encourage you to look, and I think that's part of the recommendations here, is to look at what the industry is already doing and leverage that because we have come across

together in this space, and I will allow you guys some time.

Mr. Latta. Yes. If -- since the gentleman's time has expired, if you all could just real briefly answer that would be great.

Mr. Day. Well, I think what we are doing today in discussing is the right first step. I think between the DIGIT Act and what we are doing with the legislation in draft form today is that first step and it's the right approach to some of these issues that we are discussing and bringing forward today.

Thank you.

Mr. Latta. Would you like to comment? Okay, thank you very much.

Mr. Costello. Yield back.

Mr. Latta. The gentleman yields back. His time has expired.

And the chair now recognizes the gentleman from California for five minutes.

Mr. Cardenas. Thank you very much, Chairman Latta and Ranking Member Schakowsky, for having his important hearing and I would like to thank the witnesses for coming forward and enlightening us as to what's going on out there in the real world.

My background is in engineering. I got my electrical engineering degree from UCSB back in the days when we used punch cards in our programming, your technical you lack.

So I think a lot has changed, but I think that many of us do welcome these changes, and having said that I think that public policy needs to make sure that we are mindful of this fast-moving effort of the Internet of Things and how it affects individuals' privacy, how it affects industries, how it affects jobs, how it affects the jobs of today and tomorrow, and how do we get American workers ready and prepared to be the workers of today and tomorrow.

These are the kinds of things that weigh on my mind. During my careers, I actually owned a small business at one time so I know what it's like for a small business to be able to pull something off the shelf in a very efficient cost-effective manner and I think the Internet of Things is making that much more efficient every single day and making smaller businesses, especially mom and pops a heck of a lot more competitive.

Wherein, the old days, maybe back in my days in the '80s and '90s when I was a business owner, everything was in maybe fives and tens of thousands of dollars to get an innovative device.

Now, it appears that we can actually get an innovative device that changes and allows us to be more efficient and hire more individuals and grow our business to the tune of hundreds of dollars.

Is that correct? Do we have devices out there that maybe 20 years ago to innovate were in the thousands of dollars and today it might be only a few hundred?

Can one of you give me an example of something that you can think of that actually touches on that?

Ms. Vachani. Absolutely. If you think about, for example, the building management that was in New York, the deployment that we did, those were sensors that were -- they were not very expensive.

We are talking sensors that are dollars on -- as it is, and they can look into a room and save a small business on their costs -- their infrastructure costs by looking at occupancy inside of a room and deciding that the AC needs to be turned on because no one's in the room.

This isn't expensive technology from that stand point but it's changing the way we live and the way we operate within our businesses and saving us cost, right.

One of the major ways that this building in New York was able to save money is we found a leak in one of their pipes. Again, we are talking about a sensor that's able to determine that there's a leak in a pipe and will waste, right, and they were able to reduce that cost.

And so from that standpoint, innovation isn't necessarily requiring extensive amount of investment but there is ways where we can start to make decisions very quick when this data comes together.

Mr. Cardenas. Ms. Richardson, I have a question -- thank

you -- I have a question for you about consumer applications and how do you think the Internet of Things devices are being used inside manufacturing workplaces?

I happen to represent a community in Los Angeles that has a big corridor of manufacturing, lots of -- tens of thousands of manufacturing jobs in my district.

Ms. Richardson. Yeah, and I think it's still unknown how this is going to affect the workforce on balance, right. You're going to create new jobs of the people who actually have to create the devices, and we hope that a strong privacy and security practice will create professionals to deal with that also.

I think there are questions to ask about whether they will replace human beings on the job. But there will always be decisions that human beings have to make that we can't let computers do.

So I don't think it will eradicate humans altogether.

Mr. Cardenas. Well, on that note, there are things such as smart helmets and smart glasses that now can be deployed in the workplace, and do you have any comments about how these devices might to affecting somebody's privacy in the workplace?

Ms. Richardson. Yes, and people's privacy in the workplace is much more limited than in their home or out in public. This is long established that employers can really control the type of information that they're collecting on their property and while

they're conducting their services.

I think, though, when you see a lot of these sorts of applications they don't have to necessarily collect a lot of personal information, right.

This is where, again, the controls built into the products on the front end are important so that you can collect the information necessary for your work but not, let's say, what they do on their breaks or the conversations they're having or things that are really not core to doing the job.

Mr. Cardenas. Thank you. I mean, Mr. Welch talked about the cow and I was thinking, wow, I hope that cow is not creeped out about the privacy --

[Laughter.]

-- about every time she walks into the barn.

But, Ms. Vachani, I know Intel has been active on the connected worker's front and arguing that they keep workers safe and productive. Can you give us an example of that?

Ms. Vachani. Absolutely. Actually, there's a really good example with a fireman which resonates with me, right. By connecting a fireman that goes inside a building we now know -- by the sensors we can tell what is the oxygen level around him, or her, if the firewoman -- the fireman is laying down or standing up, what exact location they're in within the building if they're laying down.

These are -- these are opportunities for us to save lives of some of our workers that are working in critical conditions. I think it's essential.

Mr. Cardenas. Thank you. I yield back.

Mr. Latta. Thank you. The gentleman yields back.

And I am sure they only have happy cows in Vermont.

The chair now recognizes the gentlelady from California for five minutes.

Mrs. Walters. Thank you, Mr. Chairman.

Mr. Day, do you believe that a review of all regulations guidelines standards and other policy efforts undertaken by federal agencies is important and do you think it will assist us in ensuring consistent policy of Internet of Things-related matters?

Mr. Day. Thank you for the question, Congresswoman.

Yes, I do. I think the SMART IoT Act, by studying all sectors of the IoT and how they regulate technology and current policies will go a long way in cutting down overly burdensome regulations and duplicative regulation as well.

I think when you're looking at the broad spectrum of applications here it's critical when you're looking at the impact on self-driving cars to getting a patient through a hospital more efficiently, cost effectively.

It's all important, and I think the legislation before us

today will streamline that process and benefit by, frankly, everyone.

Mrs. Walters. Okay. Thank you.

And Ms. Vachani, can you please discuss the benefits to a connected world both for business like Intel as well as consumers who use Internet of Things products?

Ms. Vachani. There's multiple benefits through the Internet of Things. Whether it be more efficiency inside of a factory, so predictive maintenance is a very simple use case that we use in factories that allow us to determine if a machine is going down sooner than it actually does go down and that'll prevent the down time for the factory, right.

This is a fundamental analytics that has changed how efficient our factories can be. Let's think of retail where one of the number-one determinations of success or how they lose customers is because the item you're looking for isn't there.

So you go in for a pair of jeans, you don't have your size, you leave, you forget. That's important that we understand what people are looking for and that we have the inventory ready for them and that we understand what inventory you have. Inventory loss is a major loss for our retail businesses, especially brick and mortar businesses.

And then I would also look at cities and how cities are using

technologies to do gunshot detection at intersections or monitoring the environment as far as air quality is concerned.

And that data enables us to decide if the changes we are making -- let's say we have in India electric rickshaws. Are they actually having an impact on our air quality and to make wise decisions based on data rather than hypotheses that we are making things better.

Mrs. Walters. Okay. Thank you.

Mr. Day, as we continue to advance toward an increasingly connected world, some have expressed concerns with protecting consumer information.

These are vitally important concerns, yet we also must acknowledge that Internet of Things devices in a connected world provide substantial societal benefits.

Can you speak to how we can protect consumer information without losing the upside to a more connected world?

Mr. Day. You know, I think it's obvious that the Chamber believes that consumers deserve to have their personal data respected by the companies and it's important that we are mindful of that, going forward.

I think the other thing that I mentioned in my opening statement was that technology is not a single all-powerful industry and that I think it's important that this is a part of every industry.

And when we are looking at the Internet of Things, I think it's something that we need to be mindful of but not directly linking the privacy, you know, issue to this legislation, as we go forward.

But I think it is something, as we've all testified to, that it's important and we need to be considering what data means now, because data is being created in massive amounts and how that is handles is truly important.

And I think that's one of the areas where the Chamber is doing a lot of work and you will be hearing more from us on some of the importance of privacy principles, going forward, as a result of some of the discussions that we've been hearing in Washington lately.

Mrs. Walters. Okay. Thank you.

Ms. Vachani, as you may know, this committee is very focused on the advancement of self-driving cars. Your testimony discusses the enormous benefit of increased mobility that autonomous vehicles will provide for aging and disabled populations.

Can you expand on this and discuss the role Internet of Things plays?

Ms. Vachani. Autonomous vehicles, what the connection back to an aging population is if you don't have public transportation for someone to get to the hospital or someone to get to where

they want to go for a social benefit, let's say, and having more independence for our elderly population, a vehicle that is autonomous is safer for them to get from point A to point B and that enables them the flexibility and the independence that we want for our elderly population.

Mrs. Walters. Okay. Thank you.

And I am out of time. Thank you.

Mr. Latta. Thank you very much. The gentlelady yields back.

And the chair now recognizes the gentlelady from Michigan for five minutes.

Mrs. Dingell. Thank you, Mr. Chairman, and to Ranking Member Schakowsky for the leadership on this issue and to everybody for being here.

I think that it's safe to say that we do have agreement on both sides of aisle about the significant and revolutionary things that the Internet of Things is bringing to industry and consumers, and you all have certainly talked today about examples where it's already making a difference.

But I continue to have a reservation that's been expressed by a number of other of my colleagues.

As we compare the rise of IoT to the development of the internet that the internet thrived because of the light regulatory touch used and I think we are not paying enough attention to

security and privacy.

So I have to already say to you, Mr. Day, before I even ask you my questions to say that we should deal with privacy is not something that I am going to be comfortable with because I think that the technology -- that the Facebook hearings have showed people had no idea of the amount of data that was being tracked and am already -- there aren't -- there isn't security on how that information is being used and we are not protecting even the privacy of an individual.

So I won't go off on that right now. But I had to respond to that comment. But I would like to ask a few questions.

Ms. Richardson, in a market that's rapidly evolving, how have you seen companies balancing getting to the market first with protecting security?

Ms. Richardson. Yes. We often see that privacy and security is what fall short here, and a lot of these controls that are considered to be best practices are not hard from a technical matter.

For example, a couple of years ago the BitTag -- the broadband internet technical advisory group -- put out a report with a list of maybe five to 10 things that were of utmost priority like encryption, right, making sure that the data collected was protected in transit in storage, avoiding hard-coded passwords -- this is one of the problems with the Mirai botnet, right.

All of those cameras were accessible with the same password the hackers knew and they were able to get all these cameras.

And if you meet some of these baseline best practices you're going to lift all boats, right. It's not going to solve every problem but it will certainly give us herd immunity as users of all these different devices.

Mrs. Dingell. Thank you.

Ms. Vachani, on the consumer side, have you seen privacy being designed into these products before they're hitting the market?

Ms. Vachani. Yes. Actually, I will tell you and hope to give you confidence that the security and privacy is utmost imperative when we are designing a solution -- where we store data, how that data is transmitted, and we look at that as a fundamental premise as we are integrating these solutions, and we make decisions that are different.

We may store data locally because it makes it easier for us to be able to protect it. And so these criterias are absolutely in the solutions that we create and we -- if you look at the solution that we had with regards to the health care monitoring, that's FDA approved and we follow all HIPAA laws, right. We enable our silicon so that our consumers are able -- our solution developers are able to follow HIPAA laws.

Mrs. Dingell. So not to be sarcastic, but as someone who

has been hacked at least 15 times, every one of the major ones, and that's one of the difficulties is once that hack occurs -- once that data is obtained by somebody you can't put the genie back into the bottle.

Mr. Day, I know your organization has -- is concerned and apprehensive about regulations, as you expressed it. But one of my concerns is going to build right on what I just said -- that down the road there will be these massive data breaches that we keep seeing or an abuse of privacy.

We'll convene a hearing. The witnesses will be questioned. Everybody will express outrage and concern, but the damage will have already been done, which was one on Facebook, which I just talked about.

Do you think it would be helpful to develop some clear rules of the road for companies now so we can try to mitigate this for the future?

Mr. Day. Thank you, Congresswoman, for the question.

And to answer you directly, yes, I firmly believe that and I think I would like to suggest that the offer is extended to work with you and your office on these issues.

In fact, the Chamber is currently going through a process right now on developing privacy principles that we will be working with Congress on.

And so I think probably earlier than later, to be engaging

with you and your staff would be a great opportunity.

I will tell you, again, that I firmly believe consumers deserve, you know, to have their personal data respected by companies that they're working with and I think that it's critical though that we strike that proper regulatory balance that protects consumers while promoting the technology that we all use every day and appreciate.

Mrs. Dingell. That's one of the biggest challenges in this committee.

I know I am out of time, Mr. Chairman, but it would be interesting for the record to get what principles they are coalescing around that you mentioned earlier in your testimony. I think it would be useful for all of us.

Mr. Latta. Thank you very much. The gentlelady yields back.

The chair now recognizes the gentleman from Kentucky for five minutes.

Mr. Guthrie. Thank you very much. It's great to be here.

Thanks, Mr. Chairman. Thanks for having all the witnesses here. We've had some really interesting hearings in this space. The other day we did quantum computing, which I am still trying to figure out.

The guy said, well, I will make it simple for you -- it's like flipping a coin and getting heads or tails is normal. In

the quantum world you can flip a coin and get heads and tails at the same time.

So that really made it simple for me. I've been thinking about that all weekend, trying to -- trying to figure out what he actually meant. That's how he explained it.

But it is good that we are getting to, like, you know, a work product out of this so it's important. So that's kind of what I want to focus on today and hopefully things I can understand.

So, Mr. Day, can you briefly explain while voluntary industry-led, globally recognized, and consensus-based processes for Internet of Things standards are so critical and could you name some examples of industry-led efforts that are currently taking place?

Mr. Day. So with this legislation is, as I testified to, I think is an important first step and I think by having certain standards set and compiling information again by all industries and sectors will benefit all of us and that I think the benefits both to consumers, to industrial, and to government are very clear and, you know, it's everything from keeping a global competitive lead on other countries and that this country needs to continue to be the leader in technology and, again, I think, you know, it's a great attribution to what the subcommittee and full committee has done on a bipartisan basis on self-driving cars

to, you know the health care applications that we've discussed.

So there's a whole host and wide variety of areas where this is a true benefit and, again, fully support the legislation -- the draft legislation and the DIGIT Act as well. We have come out in support of that early on and work -- hope to work with the committee, going forward, on passing the legislation.

Mr. Guthrie. Thanks. And so, Ms. Richardson, why do you believe compiling a list of industry standard-setting efforts under the SMART IoT Act will be a critical part of helping to inform future congressional action?

Ms. Richardson. Yes, and we would go one step further to say the list should also come with an estimation of whether the standards are being estimated. We don't want you to come back or get a report back that has a thousand standards listed because the next question is going to be well, are these being implemented, right -- who's using these and are they working.

That's the logical question and I think that's what Congress, advocates, industry is sort of dancing around at this moment -- is that process working.

So I would recommend to include that analysis top and that would help you figure out where you really want to focus your efforts, going forward.

Mr. Guthrie. Okay. Thank you.

And Ms. Vachani, we've heard in the past hearings about the

critical need for security and good cyber hygiene both in production lines for IoT devices within the -- and within the federal government.

What are you doing at Intel to safeguard IoT devices and networks from hacking vulnerabilities and what can small to mid-size businesses do to take meaningful steps to address data security concerns?

Ms. Vachani. So if I look at Intel's contribution here, we are -- our security is fundamentally written into the silicon development. So it's in hardware, its software. It's in the connectivity. So we think of silicon across the board and we think of security across the board.

We are also -- one of the areas that you talked about was software defined, right. Can -- as security standards start to change or as we learn more can we reprogram our devices -- can we update those. And so that's included in our assumptions.

So we enable the industry through not only hardware but software security to be able to implement the best known security that we know at this point in our space.

So absolutely paramount in what we do.

Mr. Guthrie. Okay. Thank you.

I know you mentioned earlier -- and I had another hearing but I heard you mention earlier -- scale. But could you name what you see as other potential impediments to deployment of IoT

and what we should be aware of, going forward?

Ms. Vachani. Well, one of the -- we've talked quite a bit about standards and one thing I want to make sure we make the point of is these standards are international, and so scale is just not within the United States.

I would like for us to be competitive internationally and having these standards that were global allows us to provide technology to other countries and export our great experience that we have here.

And so I believe the interoperability and enabling us to be competitive internationally and taking advantage of these international standards will be -- will be important for us to be successful.

Mr. Guthrie. Thank you, and thank you for your testimony. I appreciate it. It's a little more understandable for someone like me. I asked the guy how could you flip a coin and get both.

Ms. Vachani. I have no idea.

Mr. Guthrie. He says, it's like -- it's like putting it in a box and the box is continually spinning and that really is the clue.

[Laughter.]

This is -- this is coming from a guy who's never solved the golf peg game Cracker Barrel. So we'll figure it out.

Thanks a lot. I appreciate it, and I yield back.

Mr. Latta. The gentleman yields back.

The chair recognizes the gentlelady from California for five minutes.

Ms. Matsui. Thank you, Mr. Chairman. I want to thank you and the ranking member for having this hearing today and I want the witnesses -- thank you very much for being here.

I've discussed the potential block chain applications with the subcommittee before including its possibility to allow spectrum sharing as next-generation broadband networks are deployed.

As you all know, block chain is a decentralized accounting technology that verifies transactions through a shared ledger system.

When a transaction and a block chain is completed, that transaction is verified against a ledger stored on each computer in the network.

The IoT and connected devices will facilitate a significant expansion of data transactions likely between multiple different networks and block chain could be used to verify and secure these transactions.

Is there an opportunity for this legislation to more precisely explore how new technologies could facilitate the secure advancement of internet-connected devices?

And anyone on the panel can answer that.

Mr. Day. I will take a first attempt at answering that question. And I agree with you -- I think block chain is certainly an area where IoT will offer a lot of benefit.

At the Chamber we are just now beginning to work on our FinTech work and we are calling on members of help us understand the benefits. And so I think there are a number of ways that we should be looking at this.

I think the legislation as drafted, though, is the correct step. It allows for technologies like block chain and others to progress.

But as we are understanding the technology and the benefits thereof we can continue to work with you and other members of Congress on implementing certain regulations as appropriate facing the technology.

Ms. Matsui. Anyone else?

Ms. Vachani. Block chain is absolutely a technology that Intel is looking at and one that can be used in IoT applications, so a really good connection there.

I think, though, one of the points that you made when you kicked off as you're looking five to 10 years out and you have the benefit of doing so, and so today it's block chain and tomorrow it is -- it could be something even more revolutionary and that's why it's important that we consider this not from a very technology-specific standpoint but you're more holistically as

to what's necessary for us to be successful, regardless of the implementation technology.

Ms. Matsui. Okay. Narrow band IoT networks are particularly useful for long-range low-power applications. Specifically, these networks improve capacity, spectrum efficiency, and power consumption levels of user devices.

Narrow band IoT networks have potential both nationwide and particularly for rural and indoor coverage. These networks can coexist with commercial mobile networks and their propagation characteristics could provide better range and reduce coverage costs for consumers in both rural areas and across the country.

Anyone on the panel -- what role do narrow band networks have in the IoT ecosystem from a spectrum efficiency cost and deployment perspective?

Ms. Vachani. I think narrow band is going to help with -- there are several elements in narrow band that makes IoT applications you have already referred to -- it's lower cost, lower power, and a longer -- which enables longer battery life.

So think about we currently have an application where we are sensing the environment for a case of strawberries, right. We want to make sure the humidity is right. We want to make sure the temperature is right. Narrow band allows for that connectivity -- the continuous connectivity while extending the battery life and not increasing the cost of something that we'd

want to do with a pack of strawberries.

Also understand that when you move to the world of 5G, now all of this comes together. So now we have a narrow band spectrum. 5G includes all of those spectrums -- will enable us to be able to pull this together as a complete solution.

It revolutionizes how we think of connectivity and our spectrums because narrow band is included as well as low latency as well as high bandwidth.

Ms. Matsui. Okay. Great.

Anyone else want to comment on that?

Okay. Spectrum is the invisible infrastructure and Congressman Guthrie and I are working on this. In the -- it underpins our communications infrastructure and adequate supply is necessary to realize the potential on next-generation broadband networks and the IoT.

Specifically, agencies should have access to funds made available for engineering research that could lead to the repurposing of spectrum for commercial use.

What role will next-generation networks play in our IoT strategy and how would delivering more spectrum to commercial users help?

Ms. Vachani. I would summarize it into one word, which is interoperability. If you think about a wider spectrum analysis, so 5G enables low spectrum as well as high -- low latency high

bandwidth, and now you have that on one network.

And so you're able to include all of those. Remember I said that it's not very much a vertical solution. We have all kinds of pieces that are coming together into an IoT solution, which can vary in spectrum and once we have a solution that encompasses all those spectrums now it makes deployments easier for our customers, thus enabling scale, which we --

Ms. Matsui. Okay. I've run out of time, so thank you very much.

Ms. Vachani. Thank you.

Ms. Matsui. Yield back.

Mr. Latta. Thank you very much. The gentlelady's time has expired and the chair now recognizes the gentleman from West Virginia for five minutes.

Mr. McKinley. Thank you, Mr. Chairman, and I apologize to the panel -- that we've got a hearing going on downstairs so we are back and forth in between them, and perhaps I've missed some of your testimony that targeted what my questions were.

But I want to begin with saying that I am going to start by assuming you have all read Case's book, "The Third Wave." Two out of three have.

I was fascinated with that book -- that the possibilities of where we might go long term, things like the -- it was mentioned about the refrigerator that could speak to you, your clothing

could tell you how your -- whether your wellness.

Those were all in the long terms. I am somewhat interested in the short term, however, and that is, is there anyone -- can you tell me from your -- the three experiences we have up here, is there something in the pipeline of the IoT that might indicate the propensity of an area to have a problem with opioid abuse?

I know some people have -- or they've talked about doing it, to be able to develop where that might be. But is there anyone that you know of that's actually got something close to fruition that we could do this?

Because we are getting, as we all know, nationally getting hit pretty hard with this and we don't know where the next problem is going to crop up until after. We are reacting rather than being proactive.

So I am curious to see with the Internet of Things in a short term is there someone developing software that might be able to identify where the next problem could crop up?

Ms. Vachani. Yes. Actually, Intel is working on a -- exactly on that problem, concerning the monitoring of medicine and the ability to know exactly where that medicine is going -- is it going to the right person, monitoring how many tablets are there and knowing exactly who's taking those -- having some facial detection -- who's picking up those tablets.

And so absolutely. I believe that there is a connection

-- you have made a very relevant connection, and thank you for that.

Mr. McKinley. What's the time -- do you have a sense of --

Ms. Vachani. We are seeing an implementation immediately, and it's an evolution over time. I mean, we are not going to have facial detection immediately at all of our pharmacies but it'd be interesting.

It's an evolution over time but we are seeing implementations right away in which we can start to monitor medicine better. It's just -- it's just a matter of is it getting to the right person, how many, and are the right people taking it.

So you think about in the opiate but you can also think about it with elderly patients as well, right, or making sure they are taking their medicines on time.

Mr. McKinley. That may be a worry but, again, the propensity -- what -- this area, this community may be hit hard next. That's what I am looking for as well.

Where -- the fact that there could be some software that says the drugs -- 20 million pills are going to one pharmacy that ought to trigger something.

Ms. Vachani. Right.

Mr. McKinley. But in the meantime, is there socioeconomic barriers that we need to break down?

So, Mr. Day, you look like you had -- you were going to contribute to this conversation.

Mr. Day. So yes, at the Chamber, Congressman, we have been looking at economic situations across the country and that impact of joblessness and how communities have been impacted by this plight and looking at ways that we can start to examine the linkage between the two.

And I think to the point on monitoring pill bottles and knowing times of when they're taken and monitoring, you know, who are getting their prescriptions, et cetera, those are things that are happening now but there is a lot more to be done.

Mr. McKinley. Well, if I could on that, that just -- because you touched on something I am kind of sensitive to is the socioeconomic -- household income, education level.

West Virginia has -- some will use that as the excuse for why West Virginia is being in that -- leading the nation in opioid overdose but number two, until last year, was New Hampshire, and New Hampshire has polar opposites on that.

It has one of the highest household income. It has the highest education level, and on and on and on, with good socioeconomics.

So think there's something separating the two between us. So I am just curious if someone's developing something more sophisticated than just going on socioeconomics.

Mr. Day. I am not personally aware, to be honest with you. But I think it would be an opportunity for us to work together as we continue our work with the Chamber and working with our member companies on various technologies, and I would be happy to do that.

Mr. McKinley. I would like to pursue that.

Ms. Vachani. I would like to offer that we can follow up with the details of the solution I just.

Mr. McKinley. If you could, back to my office, I would appreciate that.

Ms. Vachani. I would love to do that, if I could help.

Mr. McKinley. All of you. Thank you very much.

I yield back my time.

Mr. Latta. Thank you very much. The gentleman yields back.

The chair now recognizes the gentleman from Vermont, and I want to thank him for all of his hard work not only in this Congress but in the last Congress, working on IoT issues with me.

So thank you very much. The gentleman is recognized for five minutes.

Mr. Welch. Thank you, and thank you as well, Mr. Latta.

I want to focus a little bit on rural America -- just to have each of you say what it is we need to do in rural America if we are going to have any opportunity to yield the benefits

of IoT.

I will start with you, Mr. Day.

Mr. Day. So I think one of the most important things, and you mentioned it earlier, Congressman, is the fact that broadband is not in every household in the country and that's first and foremost, I think, for a lot of reasons, I think, for being able to compete globally, being able to be connected and be able to have a business based upon the internet is critical.

And so I think for rural America -- and I applaud your efforts. That's first and foremost.

Mr. Welch. Thanks.

Ms. Richardson.

Ms. Richardson. Well, I think the whole point of having standards and what your bill is discussing is to shift the responsibility for security to the people who can best address it, right -- the manufacturers, the operators -- and I think this is where sort of low-tech users benefit most from this.

And so to the extent that your rural users are rapidly deploying new technology that they're not familiar with they will certainly benefit from better security standards.

Mr. Welch. Thanks.

Ms. Vachani.

Ms. Vachani. Absolutely. I think -- I absolutely applaud the benefit to get broadband into rural America but understand

that we can do technology -- implement technology today whether it be a cellular signal, right.

I will give you the example of my parents, who still live in the same house that I grew up in and won't leave no matter what I do at this point.

Having some type of monitoring, making sure they're getting up in the morning and that they're -- oh, somebody's opened the refrigerator, that she's eating -- there's elements of that that I think is important that we can do today for rural America with the connectivity that we have and we don't have to limit ourselves to that deployment.

Mr. Welch. Okay. Thank you.

The other broad question -- I just want to go down the panel -- is about privacy and security. You have talked a little bit about that.

But is there a role that you believe the Congress has to play in ensuring an individual's personal data is protected and is it your view that an individual has to have the control over how his or her data is being used -- something we asked Mr. Zuckerberg when he was here a while ago?

Mr. Day. Well, again, I think to emphasize the point that consumers, again, have and deserve the right to have their personal data respected by all.

Mr. Welch. Let's go quickly because I have one more

question.

Mr. Day. As we develop our principles at the Chamber, I look forward to working with you on those details.

Mr. Welch. Thank you.

Ms. Richardson. We eventually need legislation. That's going to be the only way out of this mess we are in.

Ms. Vachani. I think working together between government and industry is essential to come up with the solutions.

Mr. Welch. But there has to be some role that Congress plays. We can't be passive observers of what's going on.

Mr. Day. Right.

Mr. Welch. Do you agree with that? Thanks.

Let me ask you, Ms. Vachani -- I know Intel has been a leader in IoT advancement and I know you have had a high position as a thought leader in that space for years.

So I want to follow up your testimony and ask if you can expand your suggestions as to the definition that we should use in his bill and why it's so important to get that definition right.

Ms. Vachani. One of the number-one challenges of scale, and it sounds very simple, is terminology. We talk past each other when we -- when we are having -- and I see us doing it in the industry, and so we are in this space.

We live it and breathe it. But we use different words to represent different things and we are talking past each other.

So one of the fundamental things I've had to do within my organization, within my company as well as outside, is to start to get on the same language and that's one of the things we are asking for this as well is just to get on the same language so we know when we are speaking to each other what we are referring to.

Mr. Welch. Okay. Thank you.

I thank the panel. Very helpful.

And I yield back.

Mr. Costello. [Presiding.] The gentleman yields back.

The gentleman from Oklahoma, Mr. Mullin, is recognizes for five minutes.

Mr. Mullin. Thank you, Mr. Chairman, and thank our panel for being here.

I got just a few questions, and Ms. Vachani -- is that how you pronounce it? I appreciate you being here and I just, for the -- for the help of myself and you might have already been asked this question, but as you have heard we were running back and forth between committees.

Ms. Vachani. No problem.

Mr. Mullin. Are there barriers or what are the barriers that's keeping the U.S. from leading in the IoT?

Ms. Vachani. You know, I will ask -- I answered this question of scale but I will answer this question slightly

differently, to add to that.

What I find is, if you look at the city level there's quite a bit of innovation going on. I talked about San Diego and what San Diego is doing within their lights in California. We talked about New York and the building that's happening in -- building management that's happening in New York.

At the city level, I believe that that implementation is taken seriously and there's a lot of innovation happening. But where I think we can make a difference is scale across the city at a nationwide -- right.

So these pockets of innovation, how we can reuse, how can we learn, and how can we deploy it more worldwide -- I mean, more United States wide.

That's slightly different than what I see in other countries where we are looking at it more nationally. India, China are looking at it more nationally, and so you'd get the benefit of the individual innovations that are happening at a national level.

Mr. Mullin. Well, I will use my district, for example, even my personal house. We don't -- we don't even have slow dial up. The best we can do is 3G through our phone, and 50 percent of my district has little to no access to the internet.

Ms. Vachani. Mm-hmm.

Mr. Mullin. And so we talk about metropolitan areas. But you're right, we are leaving out the rural pockets, which is by

mileage wise is the vast majority of our country.

Is that -- is the other countries, as you alluded to, are they doing a better job at that and then -- and if so, what are they doing that we are not?

Ms. Vachani. So large parts of India and large parts of China don't have connectivity either, right, and so that isn't an isolated and probably more of an issue there than it is even here.

They are looking at how to deploy faster so that these rural areas do have connectivities -- that's one area we could look further at -- as well as leveraging the technology that is available.

So going into a factory in another country -- they have connectivity, no broadband, but they have some level of 3G -- we are able to leverage that to at least start to get some automation within the factory. So, again, taking advantage of the connectivity that we do have an maximizing that, at the same time deploying more robust connectivity.

Mr. Mullin. So how -- what role can Congress play then? How can we -- how can we encourage companies or industry to look out farther than just in metropolitan areas?

We did this with electricity. We did this with phone service. This is a new technology that's keeping us from connecting. So what is that we can do? What can Congress do,

to put in place, to help encourage that?

Ms. Vachani. I think we can look at this not in the siloes that we do today. You have the benefit of a holistic view, not just in each department but as a holistic view how we deploy this.

Mr. Mullin. Right.

Ms. Vachani. That's the benefit, and then, frankly speaking, how do we invest so that we start to -- start to deploy this technology more robustly -- is there an investment strategy to that as well.

Mr. Mullin. Thank you so much.

Switching gears, Ms. Richardson, how difficult is it to secure an IoT device?

Ms. Richardson. I think that would depend on the device itself and how it's connected to the internet. I think there are a handful of best practices that we see across different sectors and industries, things like encryption, strong password and other authentication models, update ability.

Mr. Mullin. Is there -- is there certain security measures been put in place since the 2014 Target breach, especially the Wanna Cry ransom?

Ms. Richardson. There's nothing mandatory and I think the -- these sorts of practices that --

Mr. Mullin. Should there be?

Ms. Richardson. That's a hard question and I am realistic

about mandatory requirements on the private sector. I don't think we are there.

I think, though, the government should explore its own purchasing power. Right now, you know, the Trump administration and some of the agencies are writing privacy and security guidelines in preparation for a big level up in purchase of IT modernization and that would be one way that you could influence the market without forcing anybody to do anything specific.

Mr. Mullin. Thank you, and I yield back.

Mr. Costello. The gentleman yields back.

The gentlewoman from New York, Ms. Clarke, is recognize for five minutes.

Ms. Clarke. I thank you, Mr. Chairman, and I thank our ranking member, Ms. Schakowsky. I would like to also thank our panel for their expert testimony here this morning.

As you may be aware, earlier this year I launched the congressional Smart Cities Caucus and I would add Smart Communities with Rep. Darrell Issa.

I was inspired to start the Smart Cities Caucus from my personal interactions with seeing the amazing build-out first hand in New York City.

The Smart Cities Caucus serves as a bipartisan group of members dedicated to bringing American communities into the 21st century through innovation and technological change.

Embracing smart technology will make our communities more sustainable, resilient, efficient, liveable, and competitive in a world in which technology is constantly advancing.

So I would like to ask a couple of questions, first to you, Ms. Richardson. What are your recommendations for the SMART IoT Act considering the interplay of the Smart Cities and which federal agencies should play an active role in sort of harnessing what we know already?

Ms. Richardson. Well, you have some of the work horses of the cybersecurity world in Commerce, right, so that is a benefit that you have with NIST, NTIA, and other places.

I think when you look at the smart cities you have a couple of different types of devices. You have really basic ones that don't collect personal information -- you know, they're low broadband information sharers, right, and they're just water pressure, how many cars passed through here, things like that, that are going to be less risky from both a security and privacy standard.

I hope that you're report will highlight some of the more high-risk things that are either facial recognition, location tracking, right. That's the result of many of these things like license plate readers or toll roads and how those are being deployed by the government.

Ms. Clarke. Ms. Vachani, Intel IoT portfolio includes smart

cities, smart buildings, and smart video. What are your recommendations and why are smart cities so important to Intel's IoT portfolio?

Ms. Vachani. Essentially, the smart cities enables us to create an infrastructure for safer cities as well as enabling our cities to do better planning.

If you look at the GE solution that we deployed on smart cities, it does stuff like gunshot detection, right. It's determining if there was a shot and, if so, what we do about it.

It looks at air quality, right, and so this enables us to take advantage of the technology we've built for many other industries. Smart cities is a culmination of many other technologies we've built maybe for a factory or for a home but we are able to leverage that to improve not only our environment as well as our cities and its planning.

So we see that there's a leverage of our technology across the board and that smart cities can take advantage of it.

Ms. Clarke. And would you just sort of envision for some of my colleagues who are in rural communities how we can sort of look at that ecosystem that is being developed in sort of more densely populated areas and what can be taken from that for sort of more sprawling communities in terms of connecting them in smart ways?

Ms. Vachani. Yes, and if you look at the -- I will go back

to the GE solution. The GE solution takes advantage of a light pole. So that's what we are building on top of. It already has electricity. It already has power. You take advantage of that power to connect up sensors and then it uses a 3G connection that goes back up into a data center.

So, again, we are able to take advantage of infrastructure that's already there and built in as best as possible.

Ms. Clarke. Very well.

And, Mr. Day, anything that you'd like to add in this?

Mr. Day. Absolutely, and I want to applaud you on your efforts with Congressman Issa with co-chairing that caucus. It's very important, and C-TEC has joined a couple of events and we look forward to continuing to work with you.

But I think when you look at a city, for example, 20 percent of a given city in the United States is dedicated during the work day to parking, and I think one of the things that C_TEC has been taking as a priority and working with you and others on is the fact that autonomous vehicles will impact both that issue as well as the environment and other issues and I think it, in the end, will prove to be very beneficial for a lot of reasons.

And so smart city activities are critical and what we are trying to do and be creative in our thinking and our approach and how IoT plays in that is paramount and a top priority of ours, going forward.

Ms. Clarke. Well, thank you very much for your response today, and I yield back, Mr. Chairman.

Mr. Costello. Gentlewoman yields back.

Seeing there are no further members wishing to ask questions, I would like to thank all of our witnesses for being here today.

Before we conclude, I would like to include the following documents to be submitted for the record by unanimous consent: a letter from the Consumer Technology Association, a letter from CTIA, and a letter from EPIC.

[The information follow:]

********** COMMITTEE INSERT 4**********

Pursuant to committee rules, I remind members that they have 10 business days to submit additional questions for the record and I ask that witnesses submit their response within 10 business days upon receipt of the questions.

Without objection, the subcommittee is adjourned. Have a good day.

[Whereupon, at 11:54 a.m., the committee was adjourned.]