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"Protecting Competition and Innovation in Home Technologies"
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Chairwoman Klobuchar, Ranking Member Lee, and distinguished members of the Committee. Thank you for the opportunity to appear before you today.

My name is Wilson White. I am Senior Director of Government Affairs and Public Policy at Google, where I lead policy efforts for our connected devices and Android operating system. Bringing more helpful services to more people is what motivates me to come to work every day.

At Google, our goal is to be helpful to people in moments that matter. It's in those moments that technology can truly improve people's lives. I think of a Google Pixel user named Chris, who was a passenger in a car that was suddenly struck at high speed by a truck in a poorly marked three-way intersection. Stunned by the impact, with the smell of burning rubber in the air, Chris was panicked. Disoriented and unsure what to do, he felt his Pixel phone vibrating. The phone had detected that Chris had been in a car accident and it automatically prompted him to dial 911 so that Chris and his family could quickly get life-saving help when they needed it most. To us, this is what it means for connected devices to help in a moment that matters.

That a phone can tell when you might need emergency help shows just how far we've come, and it's just a preview of the innovations that lie ahead. Just thirty years ago, most Americans were fortunate if they had a computer at home, and even luckier if it could access the Internet. Today, most Americans have a supercomputer in their pocket. Access to the Internet on desktop computers paved the way for an innovation explosion on mobile phones. We're now witnessing the dawn of a new era in computing, beyond the mobile phone, where a growing number of devices in our lives will harness computing to help and support us.

At Google, we're proud to play a role in spurring innovation in this fast-moving, hyper-competitive, but nascent space. We've always believed that open platforms enable competition, which is the best way to put great services in the hands of users at the lowest cost.

It's in that spirit that we've pushed for openness across smart home devices. Back in 2019, we joined with others to create an independent working group to build an open connectivity standard that would allow devices to work together across a range of smart home

ecosystems. Open standards foster competition by leveling the playing field for smaller players and new entrants, simplifying product development, and increasing choice for consumers.

The working group--now called the Connectivity Standards Alliance--has come a long way. Last month it announced Matter, an "interoperable, secure connectivity standard for the future of the smart home." We're bringing Matter to Android and a range of Nest products, making these products more open and customizable.

The future of connected devices has never looked more promising. In my testimony today, I will focus on three factors that shape Google's approach to this new and innovative space:

1) helping users choose which services to use and putting users in control of their data;
2) building open platforms that enable other companies to build successful products; and
3) intense competition from rival device makers and platforms.

Giving Users Choice and Putting Them in Control of Their Data

Our primary focus is our users. Even at this early juncture in the development of connected device technology, we see amazing promise in the power of technology to help consumers in ways big and small. And we believe that realizing the promise of this technology requires putting users in control of their experience.

For example, our Nest Learning Thermostat was built to put people in control of their energy consumption. It helps them save about $131-$145 a year in energy costs, reduces energy consumption, and helps address climate change. This shows how a product that many found unremarkable, a thermostat, can have an outsized impact when paired with leading-edge computing.

Sometimes putting the user in control can transform a person's life in profound ways. Take Steve Saling. Steve was diagnosed with ALS nearly 15 years ago. Using our AI-powered speech recognition advances, Steve can now activate his smart home devices with non-speech sounds. This technology can help millions of people with speech impairments caused by neurologic conditions such as stroke, ALS, multiple sclerosis, traumatic brain injuries, and Parkinson's. And for people living with paralysis and mobility impairments, voice-enabled devices can be a game changer. In the words of Chanda Hinton: *"As a woman living with a disability, I never felt comfortable answering my door or letting someone into my house. Google allows me to see who is at my front door so I can feel more secure and confident living on my own. When you are paralyzed, your most powerful tool is your voice."*

Choices About Which Products to Use

Helping users control their experience also means providing them with meaningful choices about which products to use and how to use them, including when those products come from our rivals. That has been Google's approach when it comes to voice assistants, for instance. Many companies preload their own voice assistant on their devices, including Siri on Apple devices, Alexa on Amazon devices, Cortana on Microsoft devices, Bixby on Samsung devices, Celia on Huawei devices, and Xiao AI on Xiaomi devices. Google's first-party devices similarly come with Google Assistant.

But on a range of devices running Android, consumers can choose to set up rival voice assistants like Amazon's Alexa, and even set those as default. Google Play even distributes the Amazon Alexa app to Android devices, where it's been downloaded more than 50 million times. And some Android devices come with Alexa built in.

Consumers have more choices than ever when it comes to voice assistants, which appear in an increasing number of products. Two months ago, Spotify announced a "new voice-controlled experience called 'Hey Spotify.'" In February, Facebook rolled out "Hey Facebook" to activate its Portal smart home devices. Last fall, the Microsoft Store released Beeb, an Azure-powered voice assistant for the BBC activated by saying "OK Beeb." And in 2019, Sonos acquired voice assistant company Snips to improve the voice experience on Sonos devices.

Android Auto, our connected car service, lets consumers choose between rival services. Drivers using Android Auto can navigate with TomTom AmiGo – a Google Maps rival. As one commentator recently noted: "By opening up Android Auto for third-party developers, Google essentially allowed software makers to release alternatives even to its own apps, including Google Maps[.]" Thousands of applications are already compatible with Android Auto, and our goal is to allow even more developers to make their apps available over time.

When it comes to smart wearable devices, today a range of our Fitbit devices support Amazon Alexa and Google Assistant, letting consumers choose. Our WearOS operating system works with Apple's iPhone, a competitor, giving users the option of pairing a watch running WearOS with either an iPhone or an Android phone. That means more options for consumers, whether it's choosing which device to buy or picking which apps and watch faces to display.

And, as I mentioned earlier, we've recently made significant progress in supporting openness across a broad range of smart home devices. We're optimistic that Matter, an interoperable standard for smart home devices, will lead to a more helpful and open smart home for everyone.

Putting Users in Control of Their Data

People who use our services trust us with their data, and it's our responsibility to protect it. We take this responsibility seriously, helping users control their data. And as technology reaches even more aspects of life, privacy and security are even more important. We're proud of our industry-leading protections and innovations in this area, helping people control how their data is used, even in a screenless environment.

We believe that products should keep users' information only for as long as it's useful and helpful. That's why last year, we decided to change our data retention practices for Web & App activity and make auto-delete the default for all of our core services, including Google Assistant. For new users, that means that by default, their Assistant activity will be automatically and continuously deleted after 18 months. If users prefer having their data being stored for less or more time, they can choose that in their settings.

For our voice assistant, we make it easy for people to choose the privacy settings that work for them. People can ask the Google Assistant questions like: "Where can I change my privacy settings?" to get answers to the most common privacy and security questions. And we make it easy for people to change their privacy settings or delete their activity at any time. Using the Google Assistant, people can delete their recent activity just by saying: "Hey Google, delete this week's activity." And they can pause any saving of their Assistant activity to their account just by saying: "Hey Google, turn on Guest Mode."

Across Google's products, our world-leading security measures are designed to automatically stop threats before they reach a user. Advanced encryption keeps data safe in transit, proactive security alerts help protect private information, and our Safe Browsing technology automatically detects and blocks threats--protecting over 4 billion devices every day.

And we share many of our privacy and security innovations freely with others. This helps advance the state of technology for everyone--even our competitors. Take differential privacy, for example. Differential privacy is a privacy protective technology that gains insights from data without compromising user anonymity. We spent over a decade building the world's largest library of differential privacy algorithms, and have open-sourced our library so others can apply these same privacy protections in products other than ours.

As an industry, we've recognized that security needs to be at the heart of connected devices as they become part of our everyday lives. That's why we, along with a range of other companies, are deeply involved in the Internet of Secure Things alliance. Together, we've developed baseline security standards and a compliance program to help ensure connected devices like light bulbs, refrigerators, air conditioners, and phones are safe for users.

We'll continue doing more to bring the best of Google's privacy and security technologies to everyone, in the smart home and beyond.

Helping Other Companies Thrive Through Open Platforms and Interoperability

Google has a proud history building open platforms that enable others to build thriving businesses at incredibly low cost. For Google, openness and innovation have gone hand in hand since the beginning, and as our platforms have grown, they've remained fertile ground for innovation by others. As we look ahead, we're doing our part to share our technology with companies building great connected products.

In 2008, we launched Android as a free, open-source mobile operating system, challenging the vertically-integrated walled gardens of the time with a brand new approach. Today, Android is the foundation for a thriving ecosystem, with more than 3 billion active devices around the world. Consumers can choose from over 24,000 device models, some selling for as little as $100. Android users can choose between multiple app stores as well, something that distinguishes Android from competing platforms that are closed.

Similarly, our Chrome browser is built on Chromium, a free, open-source browser platform that powers over two dozen rival browsers, from large incumbents like Microsoft's Edge and Amazon's Silk to smaller upstarts like Brave and Vivaldi, lowering barriers to competition and increasing choices for consumers.

And we've put Google's machine learning innovations in the hands of companies all over the world by freely open-sourcing our machine learning system TensorFlow and our cloud hosting system Kubernetes – spurring competition and innovation across the cloud industry. Likewise, with R&D spending of almost $28 billion last year, Google pioneers fundamental science and technology research. But we share much of our hard-earned learnings freely and openly to advance science for everyone. We've published over 7,000 research papers, and shared over 90 massive datasets. According to one estimate, Google publishes more leading AI research than Stanford and MIT combined. We've long believed this sort of openness benefits other companies, consumers, and the wider economy.

We're carrying that approach forward to the next generation of connected services, hoping that openness will again catalyze innovation in a young and rapidly growing sector.

Google Assistant, for example, offers new ways for consumers to interact with and use products from thousands of companies, expanding access to those companies' services and helping them innovate. And we provide it at no cost to the businesses using Google Assistant. We've opened Google Assistant to developers like Zynga and device makers like iRobot, helping them grow their businesses and giving consumers more choices. Google Assistant

now works with 50,000 smart home devices from more than 10,000 brands. And consumers can use Google Assistant to perform over 1 million actions, making it easy to set alarms, get directions, make a call, secure their home, control appliances and entertainment systems, or check sports results with a simple command.

And we continually invest in new tools to give developers even more capabilities. Android developers can easily integrate their apps with the Google Assistant, helping consumers get things done. The eBay app is one example, where the Google Assistant facilitates an end-to-end shopping experience for eBay users. And Walmart app users can say "Hey Google, reserve a time slot with Walmart" to schedule a grocery pickup.

We're also helping to spur the next generation of innovation in this space. Our Google for Startups Accelerator: Voice AI program is helping a diverse set of 12 voice startups accelerate their work tackling complex challenges across accessibility, education, and care.

Global Competition in a Nascent, Growing Sector

The connected device space is dynamic and competitive. Today, the average smart home has nine smart devices, up from three in 2016. The number of IoT startups and related businesses grew 27% in 2020. Companies small and large, young and old are competing across a range of industries, including automotive, consumer devices, energy, healthcare, manufacturing, and security.

I'll focus on a few examples.

Nearly 70% of US smart speaker users will use an Amazon Echo device in 2021, according to an eMarketer estimate. More than 100 million smart home devices are connected to Amazon Alexa. And Apple has claimed that Siri, featured on Apple's smart speakers and iPhones, is the most popular voice assistant in the world. Other companies make smart speakers too, including Belkin, Bose, LG, Harman Kardon, and Sonos.

Beyond smart speakers, Facebook and LG have released smart display devices. And there are smart lights and switches from Philips Hue, TP-Link, Sengled, Geeni, Feit, Lutron, and Ring; smart security and monitoring devices from Ring, Blink, Wyze, Arlo, ADT, Alarm.com, and Chamberlain; smart energy devices from Honeywell, Ecobee, Emerson, Kidde, and Lutron; and smart media devices from Microsoft Xbox, Roku, Samsung, LG, Vizio, Verizon Fios TV, DTV, Dish, and Sony Playstation.

A wide variety of large and small companies are powering growth in wearable devices like smartwatches and fitness trackers. Over 100 million wearables shipped in Q1 of 2021, up 34.4%. According to IDC, "While market leaders like Apple and Samsung maintained

double-digit market shares during the quarter, most of the growth came from smaller companies." Huawei is a major player in this space, with shipments up more than 31% last quarter. Amazon and Garmin are also active in this space.

There's also significant competition among companies providing connected platforms and services for cars, including Apple, Amazon, Microsoft, LG, Cerence, and more. More than 600 car models support Apple CarPlay, and more than 350 million cars have shipped with Cerence technology.

Among industrial applications of IoT technology, some estimate an annual economic impact of up to $11.1 trillion in 2025 from IoT applications, with customers--like factory owners using IoT-guided machines, operators of remote transportation fleets, doctors using smart medical devices, and consumers--capturing more than 90% of that value. Competition in this space is robust. Microsoft, Amazon, Cisco, IBM, Oracle, and Salesforce all offer popular IoT platforms.

Conclusion

I'm grateful for the opportunity to appear before this Committee. Connected devices show incredible potential to serve consumers in moments that matter, and in ways that were unimaginable three decades ago when Americans first got a taste of computing in their homes. We've come a long way since then, but we're still in the very earliest days of an exciting period of competition, growth, and innovation.

America's success in the years ahead isn't guaranteed. Competition is fierce in this space, and American companies face stiff pressure from companies around the world. For example, Huawei is building an operating system to ensure China becomes "the most advanced nation" in the IoT space, according to Huawei's president of consumer software. Huawei officially launched HarmonyOS on June 2, and said it aims to deploy HarmonyOS on 300 million devices by the end of the year.

The United States can help this sector thrive by encouraging platform openness as a way to unleash innovation and consumer choice. But that won't be enough to preserve America's global technological leadership in a field that will define the future of how people around the world access technology to improve their lives. American leadership will require investments in the technologies underlying these products, including semiconductors, encryption, ambient computing, machine learning, and artificial intelligence. We welcome this Committee's interest in creating the right environment for American companies and consumers to continue investing in this new, rapidly evolving space so it can thrive.

Thank you again for inviting Google to participate in this discussion. We look forward to continued engagement with this Committee on these important issues.