TESTIMONY OF ROGER ENTNER, FOUNDER, RECON ANALYTICS LLC, BEFORE THE U.S. SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION'S SUBCOMMITTEE ON COMMUNICATIONS, TECHNOLOGY, INNOVATION, AND THE INTERNET

"Exploring the Value of Spectrum to the US Economy"

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Introduction

Chairman Wicker, Ranking Member Schatz, and Members of the Subcommittee, thank you for giving me the opportunity to testify this morning. My name is Roger Entner and I am the Founder of Recon Analytics, a boutique research and consulting firm focused on the telecom industry, and, in particular, the wireless sector. For more than 20 years, I have been tracking and reporting on the business and technology evolutions occurring in the U.S. wireless industry.

For more than a decade, I have been analyzing the impact that the mobile industry has had and can have across the U.S. economy, especially with regard to promoting job creation. Today, I am here to discuss this research and to highlight the importance of the federal government continuing to free up additional spectrum to support 5G and future network evolutions.

State of the U.S. Mobile Wireless Industry

I'd like to begin with an overview of the U.S. mobile wireless industry:

- There are more than 370 million mobile connections in the US, of which 329 million are smartphones and regular phones.
- In 2015, Americans spent 2.9 trillion minutes talking on their mobile phones, sent 1.9 trillion text messages, 218 billion pictures and used 9.6 trillion MB of data. This compares to 2.2 trillion minutes talking on their mobile phones, 2 trillion text messages, 57 billion pictures and 388 billion MB only 5 years ago.
- We have 307,626 cell sites in this country, compared to 183,689 ten years ago.

Competition in the U.S. wireless industry remains intense. When Verizon reintroduced its unlimited plans with HD video it took its three nationwide

competitors only four days to match its offer. 99.9% of Americans have access to at least one wireless operator, 99.7% have the choice between two operators, 97.9% between three operators, and 93.4% between four operators. In addition, Americans can choose from a variety of plans that fit their best needs with different amounts of data attached to them. Even the smallest service plans now include unlimited voice calling and texting.

Other aspects of the industry also remain very competitive. Americans can choose from dozens of devices from their mobile operator or bring their own devices to use with their operator's service. Americans also have a wide variety of choices how they pay for mobile services.

U.S Wireless Industry and Job Creation/Economic Growth

The mobile industry, directly and indirectly, supports 7 million jobs in the United States. In 2014, wireless carriers spent more than $21 billion on network equipment and another $27.1 billion on professional services. The wireless industry contributed $194.8 billion in GDP in 2014, up from $146.2 billion three years' prior. As of 2014, mobile wireless services created a consumer surplus of $640.9 billion.

The carriers themselves are not the only source of job creation and economic growth. The App and Mobile Content market – such as movies and TV shows consumed on wireless devices – is a $36 billion industry. New business models such as Uber, Lyft, and Airbnb that rely on fast, mobile broadband networks would be unthinkable without mobile connectivity. Together, these three companies alone are valued at $98 billion.

Keeping the Pump Primed with Additional Allocations of Spectrum is the Single Most Important Factor to Keeping the U.S. Mobile Industry an Engine of Economic Growth for the U.S. Economy

Over the last four decades, Congress and the FCC have provided the wireless industry with increasing amounts of spectrum to expand network reach and capacity. However, the allocations have consistently proven to be stop-gap measures because more capacity begets demand for more capacity. Initially, exploding demand for voice services was the big driver for spectrum, but by 2008, data took over as the big driver. From 2008 to 2015, data usage increased from 15 million MB to 9.6 trillion MB, a 643x increase.

Cisco and Ericsson are forecasting a 5-fold increase in data usage in the United States over the next six years. In order to increase capacity and download speeds to satisfy the demand for unlimited data, especially video, the United States needs at least ten times more spectrum allocated for commercial mobile use. While there are certainly tremendous innovations happening in the world of spectrum efficiency such as carrier aggregation technologies, increases in the efficiency of wireless networks can only do so much. Deploying new spectrum is the most effective and quickest way to provide more capacity and drive economic growth and new job creation.

Deploying new spectrum has a direct impact on U.S. economic growth. Every 10 MHz of deployed spectrum creates $3.1 billion in GDP and 100,000 new jobs.

The Internet of Things – The Next Frontier

The Internet of Things (IoT) is the next frontier of wireless. Virtually every device benefits from being connected. Connected cars are rapidly becoming the industry standard. Trucking companies are tracking all their vehicles and the goods they transport at all times. The medical community is undergoing massive change by remotely connecting patients with doctors for tracking vitals and diagnosing illnesses.

Video is also coming to IoT. Consumers and municipalities alike are placing more cameras in their homes and cities and connecting them to the web. Some are connected through unlicensed spectrum; some are connected through licensed spectrum. Smart cities in particular will rely on licensed spectrum to connect disparate assets.

Suggestions for Spectrum Policy in the 21st Century

The Mobile Now Act is a great next step in the journey to clear more spectrum. But, as demand for mobile services is increasing, the need for spectrum is increasing as well. In addition to dedicating more spectrum for commercial mobile use, Congress and the FCC need to take additional steps to facilitate continued growth in wireless use, including for IoT.

For example, licenses should be allocated in larger channel sizes. In the past channel sizes did not matter; now, they do. Fully realized 5G deployment needs at least 20x20 MHz channels.

Such deployments also need cleared spectrum for which providers have exclusive use. Such use is preferable to sharing, which creates a whole new set of challenges for licensees which could undermine 5G deployments. In addition, all spectrum users – commercial and governmental – need to use spectrum as efficiently as possible, which will make surplus spectrum available for new uses.

While increasing the overall quantity of available spectrum is important, it is also now critical to ensure that spectrum with different propagation characteristics is made available for commerce mobile use. We need more spectrum in low, medium and high bands for specific usages. Low frequency spectrum is particularly useful to cover large swaths of land and to provide service inside buildings. Medium frequency spectrum provides coverage and capacity in many places. High frequency spectrum is ideal for small areas of high usage to deliver maximum capacity while minimizing interference with other cell sites.

Further, regulatory actions impede the deployment of new networks and services. Local zoning regulations are often a roadblock to deployment, slowing down, if not preventing, the deployment of new equipment or even making modest changes to existing equipment. At a minimum, the federal government could accelerate the deployment of mobile services by streamlining the approval process for small cells, DAS and other equipment that do not require the construction of a new tower. In addition, Congress can provide regulatory certainty that establishes a reliable planning framework to deploy more wireless facilities by clarifying that broadband providers are not subject to Title II of the Communications Act.

Conclusion

Thank you again for the opportunity to testify at this important hearing. The wireless industry has helped drive economic growth and job creation, even during the Great Recession, and can continue to do so as long as Congress and the FCC implement sound spectrum and regulatory policies. I look forward to answering your questions.