Before the

U.S. House of Representatives

Subcommittee on Communications & Technology

Hearing on "Equipping Carriers and Agencies in the Wireless Era"

Statement of

Dean R. Brenner

Senior Vice President, Government Affairs

Qualcomm Incorporated

June 27, 2013

Summary

Qualcomm, an American company, is the world's largest licensor of wireless technology and the world's largest manufacturer of chips for wireless devices. Our chips support licensed and unlicensed technologies and as many frequency bands as possible. We strive to develop new technologies, add them into our chips, and support every new band, as quickly as possible. Given the enormous growth of wireless usage, we deeply appreciate the Subcommittee's efforts to enact the Middle Class Tax Relief and Job Creation Act of 2012. The FCC must implement the voluntary incentive auction successfully to help ease the spectrum crunch.

Our goal is to meet the "1000x Challenge"—to expand wireless capacity by 1000 times. If usage doubles for ten years, it will be 1000 times today's. Qualcomm, the industry and policymakers must work together on many fronts, in parallel, to meet the 1000x Challenge. The combination of massive research and development, extensive deployment of new licensed small cells, and far more spectrum provides a good path to meet the 1000x Challenge.

First, we are developing new technologies to help meet the 1000x Challenge such as: Carrier Aggregation and Supplemental Downlink, for more capacity and faster data speeds; LTE-Broadcast to deliver content where many people want to see the same thing; LTE-Direct to enable communications when cell networks go down; 802.11ac and ad for faster unlicensed services; DSRC, to enable cars to communicate to avoid collisions; and, broadband for airplanes.

Second, to create 1000x more capacity, cell base stations need to be much closer to devices. Licensed small cells, integrated into wireless networks, will help meet the 1000x Challenge.

Third, meeting the 1000x Challenge will also require far more spectrum. The industry needs more clear, exclusive use licensed spectrum, such as the 600 MHz spectrum from the voluntary incentive auction. Clearing new bands by a date certain and auctioning them for exclusive use is the industry's top priority. For unlicensed, wide contiguous bands, adjacent to an existing unlicensed band, such as 5.4 GHz, which the 2012 directed NTIA and the FCC to consider for sharing, is ideal. Other government bands are equally important. We support the President's Memorandum to resolve the practical issues to free up 1755-1780 MHz, and we look forward to working with the new Spectrum Team created in the Memorandum.

We're also focused on other government bands that are not used coast-to-coast, 24/7, but will not become clear in a reasonable time, such as 3.5 GHz, which would be ideal for licensed small cells. Qualcomm and others have proposed Authorized Shared Access (ASA) to enable use of a band such as 3.5 GHz by an operator when and where it's not used by the government. A database would ensure that government operations are fully protected from interference, and the operator can provide a predictable quality of service when it can use the spectrum. ASA can provide access to bands that would otherwise be unavailable for many years, without requiring any new technology or devices. We're working very constructively with NTIA and the FCC on this initiative, which is another important aspect of meeting the 1000x Challenge.

Good morning, Chairman Walden, Ranking Member Eshoo, and Members of the Subcommittee. I'm proud to begin by saying that Qualcomm, an American company, is the world's largest licensor of wireless technology and the world's largest manufacturer of chips for wireless devices. Our chips support licensed technologies, 2G, 3G, and 4G; unlicensed Wi-Fi, Bluetooth, and NFC; and, GPS. Our chips support as many frequency bands as possible because there are now approximately 40 bands worldwide for LTE alone.

We strive to develop new technologies, add them into our chips, and support every new band, as quickly as possible. We work with virtually every wireless carrier and manufacturer in the world. Qualcomm constantly innovates and works with our many partners to deploy our innovations swiftly.

We base our views on spectrum policy on technical feasibility and implementation. When we think about a new band, we always ask what technology is best suited technically for it, and what policies will enable the industry to start using it rapidly and broadly.

Every day, we deal with the enormous growth of wireless usage, and that's why we deeply appreciate the Subcommittee's efforts to enact the Middle Class Tax Relief and Job Creation Act of 2012.[1] In our view, the Subcommittee got it right, and to help ease the spectrum crunch, it's crucial that the FCC successfully implement the voluntary incentive auction authorized in the Act.

Qualcomm's goal is to meet what we call the "1000x Challenge"-- to expand wireless capacity by 1000 times.[2] Wireless data usage is doubling each year, and if that trend continues, in ten years, the usage will be 1000 times today's. Qualcomm, the industry, and policymakers must work together on many fronts, in parallel, to meet the 1000x Challenge. The combination of massive research and development, extensive deployment of new small cells, and allocation of far more spectrum provides a good path to meet the 1000x Challenge.

Let me start with R &D. Last year, we spent almost $4 billion, or over 20 percent of revenues, on R & D, including many initiatives to help meet the 1000x Challenge, such as:

[1] Public Law No. 112-96, 126 Stat. 156, enacted February 22, 2012.

[2] See http://www.qualcomm.com/solutions/wireless-networks/technologies/1000x-data.

- Carrier Aggregation and Supplemental Downlink to bond together separate bands for more capacity and faster data speeds for consumers;
- LTE-Broadcast for multi-casting of video and data in places where many people want to see the same content;
- LTE-Direct to allow first responders and others to communicate device-to-device even if the cell network is down;
- 802.11ac and ad for faster Wi-Fi and other unlicensed applications;
- DSRC, which enables cars to communicate with one another to avoid collisions; and,
- a next-generation system to provide broadband for airplane passengers.

In addition, creating 1000x more capacity will require locating cellular base stations much closer to devices. I'm not talking about putting cell towers closer to people's homes. I'm talking about integrating licensed small cells into cell networks—cells as small as the one I am holding in my hand. This cell, with one of our chips inside, has the connectivity of a base station, but at much lower power. You can put it indoors, where so much wireless traffic originates. Software will integrate it into a wireless network to create a hetnet—a heterogeneous network with cells of different sizes.

The third prong to meet the 1000x Challenge is your focus today: spectrum. We need more spectrum—far more spectrum. We need more clear, exclusive use licensed spectrum, such as the 600 MHz spectrum from the voluntary incentive auction. Clearing new bands by a date certain in a reasonable time, and auctioning them for exclusive use, is the industry's top priority. For unlicensed, wide contiguous bands, adjacent to an existing unlicensed band, such as the 5.4 GHz band that the 2012 legislation directed NTIA and the FCC to consider for sharing, is ideal.[3]

Other government bands are equally important and do not fall easily into the two categories I just mentioned. We support the President's Memorandum that seeks to enable the exchange of

[3] See Section 6406 of the Middle Class Tax Relief and Job Creation Act, supra.

information and resolve other practical issues that have hamstrung efforts to free up 1755-1780 MHz.[4] We look forward to working with the new Spectrum Team created by the Memorandum.

We are also focused on other government bands that are not used coast-to-coast, on a 24/7 basis, but will not become clear in a reasonable time, such as 3.5 GHz. 3.5 GHz would be ideal for licensed small cells, operating at low power and minimizing any impact on government operations. A small cell can operate at 3.5 GHz because its signal need not travel far, but it requires licensed spectrum to avoid interference. We're working very constructively with NTIA and the FCC on this band.

Qualcomm and others have proposed what we call Authorized Shared Access (or ASA) to enable commercial use of a band such as 3.5 GHz when and where it is not used by the government.[5] ASA is binary—either an operator or the government would use the spectrum at any given time and location. A database would ensure that government operations are fully protected from interference and when the operator uses the spectrum, it can provide a predictable quality of service. ASA can provide access to bands that would otherwise be unavailable for many years, without requiring any new technology for devices or networks.

Thank you. I look forward to answering your questions.

[4] See Presidential Memorandum, "Expanding America's Leadership in Wireless Innovation," issued June 14, 2013.

[5] See Comments of Qualcomm Incorporated, In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, Docket 12-254, filed February 20, 2013; Reply Comments of Qualcomm Incorporated, In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, supra, filed April 5, 2013.