**Before The**
**Federal Communications Commission**
**Washington DC 20554**

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| In the Matter Of | ) | |
| | ) | |
| A National Broadband Plan for Our Future | ) | GN Docket No. 09-51 |
| | ) | |
| Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans In a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, As Amended | ) | GN Docket No. 09-137 |
| | ) | |
| International Comparison and Survey Requirements In the Broadband Data Improvement Act | ) | GN Docket No. 09-47 |

**COMMENTS OF QUALCOMM INCORPORATED IN RESPONSE TO NBP PUBLIC NOTICE #26 REGARDING USES OF SPECTRUM**

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Dated: December 21, 2009

## SUMMARY

Qualcomm is pleased to respond to NBP Public Notice #26, which seeks comment on issues relating to whether spectrum allocated for broadcasting can be repurposed for wireless broadband. As Qualcomm has maintained throughout these proceedings, it is vitally important that the Commission identify, allocate, and auction considerably more licensed spectrum, hundreds of MHz, for wireless (i.e., mobile) broadband to ensure that the operators can keep up with the burgeoning, exponential growth in demand for mobile broadband devices, applications and services. Comments of Qualcomm filed on June 8, 2009 at 15-17, Reply Comments of Qualcomm filed on July 21, 2009 at 1-2; Comments of Qualcomm filed Sept. 30, 2009 at 27-28; Comments of Qualcomm filed on Oct. 23, 2009 at 23-25; Reply Comments of Qualcomm filed on Nov. 13, 2009 at 2-5; Comments of Qualcomm filed on Nov. 20, 2009 at 23. Stakeholders from every aspect of the wireless industry agree that more licensed spectrum is needed for mobile broadband, as reflected in the many filings previously made by trade associations (CEA, CTIA, and TIA), carriers (including AT&T, Bright House Networks, Clearwire, MetroPCS, Sprint Nextel, T-Mobile USA, US Cellular, and Verizon Wireless), and other vendors (Ericsson and Motorola). Reply Comments of Qualcomm filed on Nov. 13, 2009 at i (citing these filings).

Moreover, as Qualcomm has also shown in other filings, there are a number of technological enhancements that wireless operators can deploy to increase capacity, including uplink interference cancellation; software and hardware upgrades which comprise 1X-Advanced, DO-Advanced, and LTE-Advanced; and, new network topologies based on the widespread deployment of femtocells and picocells to achive greater frequency reuse. But these capacity increases, which will take time to deploy and are not cost-free, will not be sufficient to keep up with the exponential growth in demand for mobile broadband services and applications. There is

no substitute for additional licensed spectrum, and Qualcomm wholeheartedly supports the Commission's efforts to identify, allocate and auction such spectrum.

In terms of repurposing broadcast spectrum, Qualcomm's FLO TV network is proof positive that broadcast spectrum can be repurposed for far more efficient uses, bringing substantial benefits to the American public. As Qualcomm has explained in other filings in these and other proceedings, FLO TV operates a nationwide mobile TV network that currently delivers 15 channels of high quality video content to cell phones and other mobile devices on the Channel 55 spectrum which was repurposed as a result of the DTV transition. The FLO technology enables transmission of up to 20 channels of video, audio, and/or data in the same 6 MHz channel bandwidth formerly used by one TV station. FLO can deliver a wide variety of content on a one to many, live, subscription basis and also content to be stored in subscriber devices, including video on demand; books, magazines, and periodicals similar to today's eReaders; and, constantly updated data streams with content such as social networks, news, weather, stock quotes, and more. Although FLO is optimized for reception on mobile devices, it is far more spectrally efficient than analog TV or digital TV.

To the extent that there is broadcast spectrum which is now vacant, and likely to remain so, a plan should be put in place to reallocate such spectrum as soon as possible so that this precious spectrum can be used for wireless broadband. The DTV transition was a tremendous sucesss. The transition proves that such reallocation can occur with no disruption or adverse impact on the public and will bring substantial benefits to the American people, both in terms of the funds raised from a spectrum auction and the plethora of new services and applications which wil be launched on the reallocated spectrum. New licensed spectrum for mobile broadband, once cleared of encumbrances, will be put to use very quickly. On June 13, 2009, the day after the

DTV transition ended, FLO TV turned on transmitters to launch service in 15 new markets and to expand coverage in 40 existing markets.

Spectrum in the TV band has superior propagation than higher bands and is, therefore, very valuable. Valuable spectrum which was given away for free by the US government decades ago should not remain fallow, particularly while the nation desperately needs more licensed spectrum to keep up with the demand for mobile broadband.

Qualcomm looks forward to a continuing dialogue with the Commission and all other stakeholders to ensure that additional licensed spectrum for mobile broadband is identified, allocated, and auctioned.

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**COMMENTS OF QUALCOMM INCORPORATED IN RESPONSE TO NBP PUBLIC NOTICE #26 REGARDING USES OF SPECTRUM**

## I. Introduction

QUALCOMM Incorporated ("Qualcomm"), by its attorneys, hereby submits these Comments in response to the Commission's NBP Public Notice #26, DA 09-2518, released December 2, 2009, in which the Commission sought comment on the use of spectrum currently licensed to broadcast TV stations. Qualcomm submits these comments based on its vast experience in developing air interfaces and other technologies for mobile broadband networks, its work as the world's leading supplier of chipsets for cell phones and other mobile broadband-enabled devices, and its operation of the world's largest mobile television network, the FLO TV network, which operates across the country on the Channel 55 spectrum in the 700 MHz band, which was used by analog and digital TV stations prior to the completion of the DTV transition on June 12, 2009.

Qualcomm makes two fundamental points in these comments. First, it is undeniable that much more licensed spectrum than is available today is necessary for mobile broadband in order to keep pace with the exponential growth in demand for mobile broadband servcies and applications. That is the unanimious view of the stakeholders involved in the many facets of the wireless industry, and there is no evidence to the contrary. Second, to the extent that there is TV spectrum which is vacant now, and likely to remain so, a plan should be put in place to reallocate this spectrum as soon as possible so that it can be used.

## II. Background

### A. Qualcomm's Technologies & Services

Qualcomm is a world leader in developing innovative digital wireless communications technologies and enabling products and services based on the digital wireless communications technologies that it develops. Qualcomm is the pioneer of code division multiple access ("CDMA") technology, which is utilized in the 3G CDMA family of wireless technologies. These technologies include CDMA2000 and HSPA/WCDMA, which are used in today's 3G wireless networks and devices to enable tens of millions of Americans, in rural, suburban, and urban areas alike, to enjoy advanced, high speed, and ubiquitous mobile broadband services. In addition, Qualcomm is deeply involved in the development and launches of the Long Term Evolution ("LTE") technology which many carriers in the US and around the world will be deploying.

In fiscal 2009 alone, Qualcomm spent $2.4 billion, or approximately 23% of its revenues on research and development. Since Qualcomm's inception in 1985, it has invested a total of approximately $12.8 billion in R & D. These enormous expenditures enabled Qualcomm to invent many of the technologies that are fueling the mobile broadband boom. Today, Qualcomm

holds or has applied for approximately 11,600 US patents (3,600 issued and 8,000 pending) and 54,100 foreign patents (18,500 issued and 35,600 pending). Every division and subsidiary of Qualcomm has multiple research and development teams working on projects which will hopefully lead to patentable inventions. This work occurs in many offices and labs around the US and the world. In addition, Qualcomm has a Corporate Research and Development group, which has its own Research Center in San Diego and other offices and labs in the US and abroad.

Qualcomm broadly licenses its technology to over 175 handset and infrastructure manufacturers around the world, who make infrastructure equipment, handsets and other consumer devices, and develop applications based on the CDMA2000, HSPA, and/or LTE air interfaces.

Qualcomm CDMA Technologies ("QCT"), a division of Qualcomm, is the world's largest provider of wireless chipset technology. QCT's chipsets provide a high degree of integration and support all the major frequency bands, the full gamut of wide area cellular technologies, Assisted GPS, Bluetooth, Wi-Fi, and many different operating systems, including Android, Windows Mobile, Symbian, and Qualcomm's Brew Mobile Platform. Devices containing QCT chips can be used to access a wide variety of educational applications wherever a mobile broadband network provides service.

Moreover, QCT has helped lead the diversification of mobile broadband into many new types of mobile broadband-enabled devices, ranging from smartphones, mobile broadband PC cards and USB dongles, Mi-Fi devices which provide a 3G mobile broadband connection to up to five Wi-Fi enabled devices, mobile broadband-embedded laptops and netbooks, and a wide variety of pocketable computing devices with mobile broadband capability.

Qualcomm Internet Services offers software platforms which aim to bring any application to any device on any network in any location. These platforms began with BREW, a thin software layer which was the first platform which enabled the downloading of applications into wireless phones. More recently, Qualcomm Internet Services began offering Plaza Mobile Internet, a platform which allows mobile devices to access widgets, thereby bringing the features and interactivity of Web 2.0 applications to mobile devices, and Plaza Retail, which provides support for multiple app stores, which give wireless subscribers a uniform and easy shopping experience on a wide variety of wireless devices.

Qualcomm MEMS Technologies, Inc. has developed the world's first MEMS display for mobile devices. This technology, known as mirasol, offers dramatically lower power consumption and superb viewing quality in a wide range of environmental conditions, including bright sunlight. A cell phone containing a mirasol display uses one-tenth to one-one hundredth of the power of a traditional cell phone display.

Finally, Qualcomm's FLO TV subsidiary operates the world's largest mobile television network. In 2003 and 2004, Qualcomm acquired Lower 700 MHz licenses covering the entire nation on Channel 55 (716 to 722 MHz). Even before the DTV transition was completed, in March 2007, FLO TV launched its network using the highly efficient FLO one to many, multicast technology. Today, in one 6 MHz channel, FLO TV's network delivers fifteen channels of high quality video content, and the technology is capable of delivering up to 20 channels of video, audio, and data. FLO can deliver a wide variety of content on a one to many, live, subscription basis and also content to be stored in subscriber devices, including video on demand; books, magazines, and periodicals similar to today's eReaders; and, constantly updated data streams with content such as social networks, news, weather, stock quotes, and more.

FLO TV's service delivers some of the nation's top video content brands, including news, sports, entertainment, and children's programming to subscribers using a variety of mobile phones sold by Verizon Wireless and AT&T. The service is not limited to mobile phones. FLO TV, through major retailers such as Amazon.com, Best Buy, and Radio Shack, sells a personal TV device, a mobile device which provides FLO TV's service to mobile TV-only subscribers.

Moreover, FLO TV and Audiovox have announced that FLO TV will be available for rear seat, in vehicle entertainment systems. FLO TV Auto Entertainment, which will be offered through a national network of more than 12,000 car dealers, will be sold with Audiovox's Advent brand, which is compatible with all vehicle makes and models and adds to any in-car rear seat overhead or head rest entertainment system with screen sizes of up to 10.5 inches. There are also approximately 23 million vehicles in the US which can be retrofitted with the small, easy-to-install FLO TV Auto Entertainment system.

FLO TV is rapidly expanding its network. On June 13, 2009, the day after the completion of the DTV transition, FLO TV turned on transmitters to launch service in 15 new markets and to expand coverage in 40 existing markets. By the end of 2009, the FLO TV nationwide network will provide its robust mobile TV service to a footprint of over 200 million people.

### B. The Rapid Proliferation of Mobile Broadband Networks & Devices

In the United States, as the Commission itself has found in May of this year, 95.6% of the US population is covered by a mobile broadband network (defined as a network based on EV-DO or WCDMA/HSPA). In fact, 99% of the non-rural US population and 82.8% of the rural US

population is so covered.[1] Worldwide, there are 578 wireless carriers in 157 countries that have deployed one of the 3G CDMA technologies. Of those 578 carriers around the world, 108 have deployed EV-DO, 70 of whom have deployed EV-DO Revision A. Another 274 of the 578 carriers have deployed HSDPA, 87 of whom have deployed HSUPA. These broad deployments create enormous demand for EV-DO Revision A and HSDPA equipment, thereby creating economies of scale which bring down prices for carriers and ultimately consumers.

Currently, approximately 830 million people around the world use a 3G device. By 2013, the number of 3G subscribers is projected to reach approximately 2.4 billion, and at that time, most 3G subscribers will be using an EV-DO or HSPA-based device.[2] This strong demand creates an ever-expanding market for 3G-based devices, including 3G phones, smartphones, PDAs, consumer electronics devices, and laptops. These devices include more than 646 EV-DO-based devices (118 of which incorporate EV-DO Revision A) and more than 1,910 HSDPA-based devices (305 of which incorporate HSUPA). The number and variety of these devices is increasing every day.

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[1] See Bringing Broadband to Rural America, Report on a Rural Broadband Strategy, released May 22, 2009, at Pgs. 12-13. In making that finding, the Commission defined networks based on EV-DO and WCDMA/HSPA as constituting mobile broadband. The Commission used the same definition of mobile broadband in its annual reports on the state of competition in the US wireless market in 2009, 2008, and 2007. See Thirteenth Report, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, WT Docket No. 08-27, DA 09-54, released January 16, 2009 at Pgs. 69, 73-74; Twelfth Report, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, WT Docket No, 07-71, released Feb. 4, 2008, at Pgs. 8, 68-69; Eleventh Report, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, WT Docket No, 06-17, released Sept. 29, 2006, at Pg. 54

[2] The source of the data on subscribers is Wireless Intelligence, a database which collects such information. Wireless Intelligence defines a subscriber (actually a "connections" as a "unique SIM, or where SIM cards do not exist, a unique telephone number, which has access to the network for any purpose (including data-only usage), but excluding telemetric applications."

As noted above, Qualcomm licenses its technology to over 175 companies, who manufacture infrastructure and subscriber devices (including phones, smartphones, smartbooks, consumer electronic devices, and the like). These companies span the entire wireless industry. In particular, the number of companies manufacturing devices based on mobile broadband technologies, such as CDMA2000 and HSPA, continues to increase, along with the different types of devices themselves. At last count, 111 companies have manufactured at least one CDMA2000 device, and more than 169 companies have manufactured at least one WCDMA or HSPA device. These devices span all price points—from low end 3G phones to very high end smartphones and other consumer electronics devices.

In particular, eighteen laptop manufacturers now offer at least one laptop model with a form of embedded mobile broadband technology, and more than 400 such laptop models have been brought to market. It is becoming increasingly common for Americans, in urban, suburban, or rural areas and of all age groups, including both students and teachers, to access the Internet and a plethora of mobile broadband services through these mobile broadband-embedded laptops or by using a PC card or USB device with 3G mobile broadband connectivity.

There is fierce competition in the US among the wireless carriers in the provision of mobile broadband services, which has brought substantial benefits to consumers and has spurred the rapid deployment and expansion of these mobile broadband networks across the country. Indeed, American consumers in urban, suburban, and rural areas are enjoying mobile broadband service at ever-increasing penetration rates and data speeds. Moreover, as the Commission found in its annual reports on the US wireless market, carriers have deployed competing mobile broadband technologies, which has only intensified the competition as the carriers seek to differentiate their networks by providing what each claims to be the best and most advanced high

speed mobile broadband network and by offering the most robust and compelling mobile broadband services to consumers.[3]

Accordingly, Verizon Wireless, Sprint, US Cellular, Leap Wireless, and Cellular South, among other carriers, have deployed the CDMA2000 (EV-DO) mobile broadband technology, and their deployments are expanding every day. Overall, according to the Commission's latest report, EV-DO is available in over 1.5 million square miles across the country.[4]

On the other hand, AT&T has deployed the alternative WCDMA/HSDPA technology, and it is expanding the footprint of its WCDMA/HSDPA network at a very rapid rate. AT&T provides mobile broadband across much of the United States. Initially, AT&T deployed HSDPA, and subsequently, AT&T completed deploying HSUPA, thereby supporting higher speed uploads and downloads. For its part, T-Mobile USA has also launched HSPA on its AWS-1 spectrum in major markets around the country and now provides this mobile broadband service to an ever-increasing footprint. Thus, the mobile broadband networks based on HSPA/WCDMA technology are also expanding rapidly.

Mobile broadband networks based on these technologies are also operated by many smaller carriers. For example, Stelera Wireless provides mobile broadband service via HSPA to rural areas in Texas. Prior to Stelera's launch, these areas either had no broadband service of any kind or very limited service. Earlier this year, Cellular South announced a major expansion of its mobile broadband service, provided via EV-DO, in Mississippi to cover the Mississippi Delta region and as well as counties in Southwest and Eastern Mississippi. Mobile broadband deployment is especially critical in Mississippi, which has the lowest overall broadband penetration among the 50 states.

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3 See Thirteenth Report at Pg. 66.

4 Id. at Pg. 73.

All told, as of May 2009, the Commission found that approximately 272.55 million Americans live within a census block in which one carrier provides mobile broadband service as defined by the FCC to include EV-DO or WCDMA/HSPA. These numbers are increasing every day as the carriers constantly expand and enhance their mobile broadband networks.

### C. New Categories of Wireless Broadband Devices

As noted supra, QCT is the world's largest provider of chipsets for mobile broadband devices. QCT constantly develops new chipsets incorporating more functionality and lower power to drive mobile broadband into an ever increasing variety of devices at all price points. In particular, QCT is in the midst of three important initiatives that are intended to expand the scope and use of mobile broadband devices by creating new categories of mobile broadband devices. These new new categories of devices will offer important capabilities for students and teachers and should provide the basis for tremendous improvements in education.

QCT's first mobile broadband initiative is a platform by the name of Snapdragon. Snapdragon, which consists of a single chip with integrated wireless modem, applications processor, multimedia, GPS and other features, enables a new generation of mobile computing devices with embedded support for mobile broadband. These new mobile broadband computing devices, known as smartbooks, are much smaller, thinner, and less expensive than traditional notebook and mini-notebook PCs and with longer battery life that provides day-long availability.[5] Smartbooks feature always-on mobile broadband connections similar to mobile phones with everyday computing functionality in sub-compact, ultra-thin, and highly portable devices. (For more information on smartbooks, see www.hellosmartbook.com.) Smartbooks

[5] In the territory of the Federal Republic of Germany, the use of the term "smartbook" in connection with portable computers is reserved exclusively to Smartbook AG, Germany.

will combine the simplicity and connectivity of smartphones with the power and usability of laptops.

At present, 15 major manufacturers are developing more than 30 Snapdragon-based mobile broadband devices. The first Snapdragon-based mobile broadband smartphone was introduced in February 2009 by Toshiba, and other Snapdragon-based devices for mobile broadband computing have been introduced throughout this year. The first smartbook will be manufactured by Lenovo and will run on AT&T's mobile broadband network.

A second QCT mobile broadband initiative consists of a global mobile broadband and GPS embedded solution for notebook computers and other wireless devices. This solution is called Gobi. Gobi-enabled notebooks can operate on mobile broadband networks in the United States and around the world. The original Gobi solution included a Qualcomm chipset, associated software and API, and a reference design for a data module supporting both the EV-DO Revision A and HSPA mobile broadband air interfaces as well as GPS. This solution allowed notebook manufacturers to deliver products that provide mobile broadband connectivity wherever the user may happen to be. Earlier this year, Qualcomm announced its second generation embedded Gobi module. This module, which will launch commercially this year, provides a wide range of enhancements, including support for additional frequencies, increased data speeds, enhanced GPS functionality, and additional operating systems, such as Windows 7 and Linux.

While Gobi was initially deployed in notebooks, it is now being embedded into other devices to provide worldwide mobile broadband connectivity. IREX Technologies ("IREX") announced a new Gobi-embedded touch-screen e-Reader, the IREX DR800SG. This innovative device will enable the wireless downloading of books, newspapers, and magazines around the

world via the embedded 3G multi-mode capability provided by the Gobi module. This device, and others like it, such as the new Amazon Kindle which also comes with embedded worldwide connectivity, will give our nation's students access to an almost limitless library of books, newspapers, magazines, etc., all for instant downloading and easy access before, during, and after school.

QCT's third mobile initiative is a new category of low-cost, low power devices that use mobile broadband networks for wireless internet access and support e-mail, social networking, e-commerce, and distance learning applications. Late last year, Qualcomm formally announced the introduction of a new low cost PC alternative by the name of "Kayak." See www.qualcomm.com/news/releases/2008/081112_qct_kayak.html. Kayak consists of a reference design and recommended software specifications that device manufacturers are using to bring to market a variety of innovative wireless devices.

These Kayak-based devices use mobile broadband technology to fill the niche between desktop computers, which typically require wireline or cable connections for internet access that is often unavailable in rural areas, and internet-capable mobile broadband-enabled smartphones. Kayak-based devices include embedded mobile broadband capability, a full featured Web 2.0 browser, and access via the browser to Web 2.0 productivity and other broadband applications. In addition, Kayak supports both television sets and computer monitors for displays and/or built-in displays. Kayak-based devices are compatible with a standard keyboard and a mouse for input and will include a music player and/or 3D gaming console functionality.

The Kayak reference design uses a Qualcomm Mobile Station Modem, which enables the user to access the internet by using a standardized web browser running at desktop resolutions and mobile broadband networks which employ 3G wireless broadband technology, either EV-

DO Revision A or HSPA. Thus, Kayak-based devices use built-in cellular connectivity and an inherently low-cost platform based on high-volume wireless chipsets. Kayak-based devices enable affordable wireless broadband Internet access and will be introduced commercially early next year.

## II. Considerably More Licensed Spectrum for Mobile Broadband Needs to Be Identified, Allocated, and Auctioned

As Qualcomm has urged in other filings concerning the National Broadband Plan, and as Chairman Genachowski has himself stated, our nation needs more licensed spectrum for mobile broadband to meet the burgeoning demand for mobile broadband devices and the wide variety of services and applications. See Comments of Qualcomm filed on June 8, 2009 at 15-17, Reply Comments of Qualcomm filed on July 21, 2009 at 1-2; Comments of Qualcomm filed September 30, 2009 at 27-28; Comments of Qualcomm filed on October 23, 2009 at 23-25; Reply Comments of Qualcomm filed on November 13, 2009 at 2-5; Comments of Qualcomm filed on November 20, 2009 at 23. Parties from every part of the wireless industry agree that more licensed spectrum is needed for mobile broadband, as reflected in the filings previously made by trade associations (CEA, CTIA, and TIA), carriers (including AT&T, Bright House Networks, Clearwire, MetroPCS, Sprint Nextel, T-Mobile USA, US Cellular, and Verizon Wireless), and other vendors (Ericsson and Motorola). See Reply Comments of Qualcomm filed on Nov. 13, 2009 at i (citing these filings).

This exponentially growing demand for mobile broadband devices, applications, and services is apparent to anyone living in America. In the first place, Qualcomm has already shown herein, the sheer number of mobile broadband device vendors, devices themselves, and the new categories of such devices already on the market and coming to market literally as soon as possible. In terms of usage, the growth in demand is staggering, whether measured on a

worldwide, US, or carrier specific basis. ABI Research now projects that monthly worldwide mobile data traffic in 2014 will exceed the total for all of 2008. See "Report: 2014 Monthly Wireless Data Traffic to Exceed Total for 2008," Wireless Week, August 4, 2009. AT&T alone has seen its wireless data traffic grow by 4,932% over the past three years. See The United States: The Most Vibrant Wireless Market in the World, September 18, 2009 Presentation by Ralph de la Vega to CTIA Wireless IT Show available at www.att.com at Slide 12. Verizon Wireless is experiencing a doubling of its data traffic every year. See "Verizon Wireless Data Traffic Doubles Every Year," October 22, 2009, http://ipcommunications.tmcnet.com/topics/ip-communications/articles/67206-verizon-wireless-data-traffic-doubles-every-year.htm. In terms of the entire US wireless industry, text messaging traffic alone grew 1,200% from 2005 to 2008. In 2008, over one trillion text messages and 14.9 billion picture or video messages were sent and received in the US. See CTIA Ex Parte Presentation to Commissioner Clyburn, Nov., 2, 2009 at Slide 3. This growth is staggering and shows no signs of letting up.

As Qualcomm has explained in other filings and in testimony in Commission workshops, Qualcomm and its partners have developed and are developing various technologies to achieve marginal gains in the capacity of mobile broadband networks, but these technologies, as important as they are, are no substitute for additional licensed spectrum, which is absolutely essential to keep pace with demand. Thus, Qualcomm and its partners have developed uplink interference cancellation; software and hardware upgrades which comprise 1X-Advanced, DO-Advanced, and LTE-Advanced; and, new network topologies based on the widespread deployment of femtocells and picocells to achive greater frequency reuse. These technologies take time and money to deploy. They will all allow wireless carriers to increase capacity and efficiency, but not by the orders of magnitude that are necessary in light of the constant

increases in demand. There is just no way around the fact that considerably more licensed spectrum for mobile broadband must be identified, allocated, and auctioned.

## III. To the Extent That There Is TV Spectrum That Is Now Vacant, and Likely to Remain So, It Should Be Reallocated for Mobile Broadband

Qualcomm's FLO TV deployment shows beyond any doubt that broadcast spectrum can be repurposed for far more efficient uses, and that such repurposing brings substantial benefits to the American public. As Qualcomm has explained supra and in other filings, FLO TV operates a nationwide mobile TV network that currently delivers 15 channels of high quality video content to cell phones and other mobile devices on the Channel 55 spectrum which was repurposed as a result of the DTV transition. The FLO technology can support up to 20 channels of video, audio, and/or data in the same 6 MHz bandwidth formerly used by one TV station. FLO is optimized for reception on mobile devices, but it is far more spectrally efficient than analog or digital TV.

To the extent that there is broadcast spectrum which is now vacant, and likely to remain so, a plan should be put in place to reallocate such spectrum as soon as possible so that this precious spectrum can be used for wireless broadband to meet the insatiable demand for wireless broadband services and applications discussed above. The DTV transition was a resounding success. There was no disruption or adverse impact on the public. The transition proves that reallocating broadcast spectrum will not harm the public and will bring substantial benefits to the American people, both in terms of the funds raised from spectrum auctions and the plethora of new services and applications which will be launched on the reallocated spectrum. New licensed spectrum for mobile broadband, once cleared of encumbrances, will be put to use very quickly. On June 13, 2009, the day after the DTV transition ended, FLO TV turned on transmitters to launch service in 15 new markets and to expand coverage in 40 existing markets.

Spectrum in the TV band has superior propagation than higher bands and is, therefore, very valuable. Valuable spectrum which was given away for free by the US government decades ago should not remain fallow, particularly while the nation desperately needs more licensed spectrum to keep up with the demand for mobile broadband.

## IV. Conclusion

Wherefore, Qualcomm requests that the Commission act in accordance with these Comments.

Respectfully submitted,

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Dated: December 21, 2009