

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Facilitating the Provision of Spectrum-Based )  
Services to Rural Areas and Promoting )  
Opportunities for Rural Telephone Companies )  
To Provide Spectrum-Based Services )

WT Docket No. 02-381

**REPLY COMMENTS OF QUALCOMM INCORPORATED**

QUALCOMM Incorporated hereby submits these reply comments in response to the Commission's Notice of Inquiry ("NOI"), Notice of Inquiry, WT Docket No. 02-381 (rel. Dec. 20, 2002), seeking public comment on the effectiveness of current regulatory tools in facilitating the delivery of spectrum-based services to rural areas.<sup>1</sup>

QUALCOMM agrees with the Commission that it is important to review the development and deployment of terrestrial wireless services to rural areas and to explore ways in which the Commission's policies might be improved to facilitate access to spectrum-based services in rural areas of the United States. As Chairman Powell noted, rural America has greatly benefited from the competition brought about by spectrum-based services. A periodic review of the unique characteristics of rural areas, their needs, and the services being provided to them should help the Commission meet its goal of facilitating access to the use of spectrum in rural regions in an effective and efficient manner.

QUALCOMM is a leader in the development of Code Division Multiple Access ("CDMA") technology, which has been licensed to over 95 leading communications manufacturers worldwide. Due to its unsurpassed voice quality, system capacity, privacy and

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<sup>1</sup> *In the Matter of Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services, Notice of Inquiry*, WT Docket 02-381 (released December 20, 2002) ("NOI").

flexibility, CDMA has been recognized by the International Telecommunication Union (ITU) as the global standard for next-generation, digital wireless communications products and services, also known as IMT-2000 or 3G. The Commission's forward-thinking spectrum policies that provide commercial mobile radio licensees with flexible service rules and the right to choose their preferred wireless technology have paved the way for the early introduction and ongoing development of advanced wireless services throughout the United States. As will be discussed in greater detail below, today, the United States is one of the first countries in the world to benefit from the introduction of CDMA-based 3G services to both rural and more densely-populated areas.

IMT-2000 is comprised of five different radio interface technologies, the majority of which are based on CDMA technology. One of the air interface standards, CDMA2000, has already been deployed in the United States as well as in more than twenty countries around the world. CDMA2000 currently includes three modes of operation, CDMA2000 1X, 1xEV-DO and 1xEV-DV. CDMA2000 1X, which is also referred to as 1xRTT, offers efficient use of available spectrum, clear and seamless migration paths from first (1G) and second generation (2G) to 3G, and overall cost efficiencies. CDMA2000 1X doubles the voice capacity of cdmaOne<sup>TM2</sup> (also known as ANSI-95 or 2G CDMA) networks and delivers peak packet data speeds of 153 kbps in mobile environments. CDMA2000 1xEV-DO increases the data rate to a peak of 2.4 Mbps, allowing access to more bandwidth-intensive applications, such as video, video-conferencing and other multimedia services. CDMA2000 1x-EV-DV, which is not yet commercially available, will provide integrated voice and simultaneous high-speed packet data services, such as video, video-conferencing and other multimedia services at speeds of up to 3.09 Mbps. Due to its spectral efficiency, CDMA2000, which uses the same channel width (1.25 MHz) as its predecessor cdmaOne<sup>TM</sup>, can be implemented within existing radio spectrum assigned to cellular, PCS and other commercial mobile radio systems.

There is a wide range of benefits to consumers residing in rural areas from the deployment of advanced wireless technologies, such as CDMA2000. For example, in addition to high-quality voice services, CDMA2000 1X technology provides access to information at speeds comparable to or better than current dial-up Internet access. CDMA2000 1xEV-DO, which has been optimized for the delivery of high-speed packet data, delivers data services at even higher

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<sup>2</sup> cdmaOne is a trademark of the CDMA Development Group.

rates and provides cost-effective alternatives to DSL and cable systems. Furthermore, the deployment of CDMA2000 systems is spurring the development of new applications, which promise to bring substantial benefits to both rural and urban societies. Examples of these applications include telemedicine, e-commerce, e-government, position location and emergency assistance.

Additionally, the migration paths from first and second-generation to 3G with CDMA2000 offer operators a means of upgrading their networks at relatively low cost and within existing spectrum bands. For example, several CDMA carriers initially deployed cdmaOne™ networks. Today, these operators are upgrading their networks with CDMA2000 equipment, which enables them to double voice capacity of their networks using the same spectrum, while simultaneously offering high speed data services. In addition, several TDMA operators in the United States and Latin America have chosen to upgrade their systems with CDMA2000.

QUALCOMM's comments on the proposals contained in the Commission's NOI will focus on two general areas: 1) the types of wireless services that are currently provided in rural areas; and 2) steps that the Commission can take to stimulate the provision of wireless services in rural areas.

### **1) Types of Wireless Services Currently Provided in Rural Areas**

Wireless technologies provide an attractive alternative for rural areas where the installment of traditional wireline systems is less desirable due to higher deployment costs, geographical constraints, and/or infrastructure limitations. A wireless system is likely to be less expensive and faster to deploy than a wireline network, particularly in rural and/or remote areas. In addition, wireless systems can be configured to handle both fixed and mobile traffic, which provides flexibility for operators to meet the demands of both types of services. Furthermore, wireless systems can be easily configured and upgraded to meet traffic demands, which is an important consideration for operators in rural areas that face higher start-up and operating costs as compared to operators serving densely populated areas.

With these advantages, as well as recent developments in technology wireless has emerged as true competitor to wireline options in rural areas. For example, IMT-2000

technologies, including CDMA2000, are providing wireless operators with increased network capacity and high-speed data transmission, which facilitate the provision of cost effective voice and Internet connectivity for rural areas.

Today there exist several nationwide and regional carriers that provide high quality voice and data services to rural and urban areas. The deployment of CDMA2000 across the United States came primarily as a result of two major national operators, Verizon Wireless and Sprint PCS, which deployed their 3G services on a nationwide basis in both the cellular and PCS bands. As of January 2003, Verizon Wireless's 3G CDMA2000 1X (launched in January 2002) has been deployed in over 900 cities and towns in the United States.<sup>3</sup> The Sprint PCS CDMA2000 network has the most digital square mile coverage and covering a population base of more than 230 million people.<sup>4</sup>

In addition to these nationwide service providers, Monet Mobile Networks, an important regional service provider, was the first company in the United States to launch a commercial CDMA2000 1X network in 1999, which it later augmented with CDMA2000 1xEV-DO in 2002. As it noted in its comments, Monet Mobile Networks is currently offering wireless data services with CDMA2000 to underserved markets in the Dakotas, Minnesota, Wisconsin and Kansas.<sup>5</sup> Western Wireless is another regional carrier that provides services using CDMA to over 1.1 million consumers in rural areas in nineteen states across the country.<sup>6</sup> Both companies have begun initial deployment of CDMA2000 1X in a portion of their service areas and plan to expand their next generation networks over the next few years.

A number of other regional operators are currently delivering advanced wireless services to rural areas throughout the United States using CDMA. In fact, nearly all of the key regional carriers providing wireless services to rural areas listed in US Cellular's comments in this proceeding utilize CDMA technology.<sup>7</sup>

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<sup>3</sup> <http://www.verizonwireless.com>.

<sup>4</sup> [http://www1.sprintpcs.com/explore/Page.jsp?FOLDER%3C%3Efolder\\_id=1163063](http://www1.sprintpcs.com/explore/Page.jsp?FOLDER%3C%3Efolder_id=1163063).

<sup>5</sup> Comments of Monet Mobile Networks, Inc., page 2.

<sup>6</sup> Comments of Western Wireless, page 3.

<sup>7</sup> Comments of US Cellular, Attachments, Table 1.

## 2) Promoting Spectrum-Based Services to Rural Areas

QUALCOMM agrees that it is important for the Commission to review periodically the development and deployment of terrestrial wireless services to rural areas in order to explore ways in which its policies might be improved to facilitate access to spectrum in rural areas. In this section, QUALCOMM will respond to the Commission's proposals contained in its NOI, as well as to the comments of other parties participating in this proceeding.

First, QUALCOMM congratulates the Commission for its policy of "technology-neutrality", which has been a catalyst for the delivery of advanced wireless services to both rural and urban areas in the United States. As described above, the United States is one of the first countries in the world to benefit from the introduction of CDMA-based IMT-2000 services, not only in most major cities, but also across numerous smaller towns and rural areas. It is the FCC's flexible use policies that have enabled carriers to respond to market demands by selecting the appropriate technology and by upgrading their existing systems with the latest technology enhancements. Such flexible use policies encourage innovation, foster competition, and facilitate deployment of new services to consumers across the country. QUALCOMM encourages the Commission to maintain its flexible use and "technology neutral" policies, which should continue to spur additional investment in the delivery of advanced wireless services to rural areas.

In addition to maintaining its flexible use policies, QUALCOMM agrees with the majority of other commenters that the Commission should provide flexibility to commercial mobile radio licensees to permit them to partition and disaggregate their licenses. In particular, QUALCOMM concurs with CTIA's recommendation that the Commission pursue "policies that encourage flexibility, such as the adoption of a 'secondary markets' approach and additional opportunities for partitioning and disaggregation of service areas."<sup>8</sup> These policies should aid service providers in finding economical approaches to advanced spectrum-based services to rural areas. QUALCOMM similarly agrees with Monet Mobile Network's recommendation that the "Commission also should consider enabling market-based spectrum management approaches such as spectrum leasing and joint operating arrangements."<sup>9</sup> These mechanisms, if employed on

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<sup>8</sup> Comments of CTIA, page ii.

<sup>9</sup> Comments of Monet Mobile Networks, Inc., page 3.

a voluntary, rather than mandatory basis, should encourage licensees to make unused spectrum available to other entities that may be in better position to utilize them in an efficient manner.

QUALCOMM also agrees with proposals to simplify the process by which wireless carriers gain Eligible Telecommunications Carrier (ETC) status. Specifically, QUALCOMM supports Western Wireless, which recommends that the FCC, the Joint Board, and state commissions “streamline the ETC designation process and make it easier for wireless carriers and other competitive entrants to qualify for the support to which they are entitled.”<sup>10</sup>

QUALCOMM also joins CTIA in urging “the Commission to continue its efforts to emphasize technologically-neutral ETC designation policies for wireless carriers and to work with states that exercise jurisdiction over the ETC-designation process to shorten the length of time for approval of ETC status.”<sup>11</sup> In this context, the term “technologically-neutral” refers to policies that treat different technology platforms, such as wireless or wireline, in a similar and equitable manner. By simplifying the process by which wireless service providers gain ETC status, the Commission will take significant steps towards ensuring that rural areas will benefit from competition and access to advanced voice and data services.

In addition to streamlining the process for wireless carriers to gain ETC, the Commission can also encourage the development of other financial incentive programs to facilitate the deployment of advanced services to rural areas. Obviously, one of the greatest obstacles operators face in providing spectrum-based services to rural areas is the lack of a profitable business case in many sparsely populated areas. The Rural Utilities Services loan program through the U.S. Department of Agriculture is an important financial incentive program. However, QUALCOMM recognizes that subsidies are often more attractive to operators than low interest loans. Another suggestion that QUALCOMM supports is Monet Mobile Network’s concept for a “Rural Area Bidding Credit” that could be offered to licensees, whether large or small businesses, that have already met the construction requirements for their licensed markets.<sup>12</sup> Finally, QUALCOMM supports the development of a web site to post information helpful to entities seeking to provide wireless services to rural areas, such as key information on financial incentives available.

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<sup>10</sup> Comments of Western Wireless, page 21.

<sup>11</sup> Comments of CTIA, page ii.

<sup>12</sup> Comments of Monet Mobile Networks, Inc., page 3.

With regard to Microsoft's comments on the capabilities of unlicensed networks to provide services to rural areas, QUALCOMM would like to highlight some important distinctions between WLANs and other broadband wireless networks. First, QUALCOMM recognizes that unlicensed systems, such as WiFi, can be an effective extension of or complement to other broadband networks. However, there are significant limitations inherent to WLAN systems that are important to consider in the context of promoting access in rural areas to advanced wireless services. For example, WLAN systems are dependent upon the backhaul used to support each node or access point. With a range of only a few hundred feet, WLAN systems are an attractive option for delivering high-speed data services within an office building or home. However, WLAN access points must still be connected to the PSTN and Internet via another broadband platform, such as DSL, T1, cable, or wide-area wireless networks, including IMT-2000. Given these limitations, WLAN technology is a useful complement, but not replacement for other broadband solutions for rural areas.

In conclusion, QUALCOMM would like to congratulate the Commission for its efforts to review the availability of wireless services to rural areas and to explore innovative ways in which it can improve its policies to better serve rural areas. QUALCOMM looks forward to working together with the Commission as it seeks to find new solutions to ensure that spectrum is used as efficiently as possible and that wireless services are deployed to all geographic regions of the United States.

Respectfully submitted,

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