

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

In the Matter of)	
)	
Preserving the Open Internet)	GN Docket No. 09-191
)	
Broadband Industry Practices)	WC Docket No. 07-52

COMMENTS OF THE CDMA DEVELOPMENT GROUP

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The CDMA Development Group (“CDG”) respectfully submits these comments in response to the Commission’s Notice of Proposed Rulemaking (“NPRM”) regarding the development of rules to preserve an open Internet.¹

The CDG is a non-profit international consortium of over 100 companies, including the world’s leading operators and manufacturers of digital cellular and third generation (3G) systems based on Code Division Multiple Access (CDMA) technology.² The CDG’s mission is to lead the rapid evolution and deployment of 3G and fourth generation (4G) systems, based on open standards and encompassing all core architectures to meet the needs of markets around the world. The CDG advocates a

¹ Notice of Proposed Rulemaking, In the Matter of Preserving the Open Internet, GN Docket No. 09-191, and Broadband Industry Practices, WC Docket No. 07-52, adopted October 22, 2009, released October 22, 2009 (“NPRM”).

² CDMA is a digital air interface that builds on the concept of employing a unique code to distinguish each call, enabling the most efficient use of a given spectrum range, and providing greater capacity over a wireless network. CDMA is a spread spectrum technology that allows many users to occupy the same time

progressive, technology-neutral approach to regulating the wireless communications market that ensures that CDMA is allowed to co-exist and compete on an equivalent basis with other wireless standards.

I. INTRODUCTION

The CDG supports the Federal Communications Commission's (Commission) goals to preserve an open Internet and stimulate investment and innovation across industries to support the ongoing development of advanced, high-quality broadband services, including broadband services provided over wireless networks. Wireless services have been one of the great success stories of the last decade—culminating with the recent, and very rapid, emergence of a variety of wireless broadband technologies and services. In large part, this success can be attributed to the pragmatic and far-sighted policies the Commission put in place over that period; policies that resulted in large amounts of investment, innovation and a highly competitive wireless market that provides advanced broadband services to nearly all Americans. The industry is at a critical juncture phase in the evolution to more powerful systems, richer broadband applications, expanding demand and greater competition. The CDG believes that regulatory policies should continue to ensure service providers the flexibility to manage their resources in the most efficient manner and certainty to recover their substantial investments. For that reason, CDG believes that network neutrality rules are unnecessary for wireless broadband Internet access providers.

and frequency allocations in a given band. It is the basis of several International Telecommunication Union standards for third generation networks, i.e., CDMA2000, WCDMA/UMTS, and TD-SCDMA.

II. WIRELESS TECHNOLOGIES—AND THE CURRENT WIRELESS REGULATORY STRUCTURE—HAVE BEEN A GREAT SUCCESS

In the NPRM, the FCC notes the key role that mobile wireless is playing to support and enhance Internet access for many consumers.³ The wireless industry's substantial investment and innovation over the past several years has significantly contributed to the greater availability and adoption of a broad range of telecommunication services in the United States. In a little more than twenty years, since 1985, wireless service providers invested over \$264 billion in infrastructure in expanding coverage and enhancing the performance and quality of their networks.⁴ As a result, 99 percent of the U.S. population have access to mobile services today, including 90 percent who have a choice of four or more competing services.⁵ Mobile penetration has soared to reach nearly 90 percent, and slightly more than 20 percent of U.S. households use mobile as the only telephone service. A similar trend is now emerging for wireless broadband services. Since the launch of 3G technologies in 2002, mobile broadband data usage has grown exponentially. In 2008, 92 percent of the U.S. population lived in areas with mobile broadband coverage, and 84 percent of the handsets sold were web-capable.⁶ The Cellular Telecommunication Industry Association (CTIA) estimates that in the first quarter of 2008, more than 40 million, or 16 percent, of mobile subscribers regularly used broadband to access the Internet. In June 2009, revenues from wireless data reached \$39 billion, a four-fold increase in four years, comprising nearly 25 percent of operators' total revenues.

³ NPRM at ¶ 158.

⁴ See CTIA Semi-Annual Wireless Industry Survey and U.S. Census data.

⁵ See CTIA (2009), "The Wireless Quick Facts: Mid-Year Figures," <http://www.cita.org/advocacy/research/index.cfm/AID/10323>.

CDMA2000 service providers have played a leading role in the explosive growth of the wireless marketplace in the U.S.; they were first to deploy nationwide 3G and advanced mobile broadband systems and introduced a wide variety of voice and multimedia services for the consumer, enterprise markets and public sector.⁷ CDMA2000 is a leading 3G technology in the United States today. More than 40 operators offer CDMA2000 services and 19 have launched EV-DO broadband systems covering more than 1.5 million square miles across the country. As of September 2009, there were 144 million CDMA2000 subscribers, including 74 million EV-DO broadband users.⁸ Verizon Wireless, Sprint Nextel, U.S. Cellular, Leap Wireless, Cellular South, and ten other carriers, have deployed CDMA2000 EV-DO Rev. A mobile broadband technology and already cover 92 percent of the U.S. population.⁹

CDMA2000 is also one of the leading 3G technologies worldwide; it is deployed by 308 operators in 116 countries, including 120 who have launched commercial EV-DO broadband services. More than 512 million subscribers use CDMA2000 networks, nearly 30 percent of which access EV-DO services.

⁶ CTIA (2009), “The Wireless Industry Overview,” August 2009, http://files.ctia.org/pdf/Wireless_Overview.pdf

⁷ CDMA2000 is one of the International Telecommunication Union’s (ITU) IMT-2000 (or 3G) mobile standards and includes the CDMA2000 1X and CDMA2000 EV-DO family of broadband technologies. CDMA2000 systems have been commercially deployed in three modes of operation: CDMA2000 1X, EV-DO Release 0 (Rel. 0) and Revision A (Rev. A) and future enhancements will include 1X Advanced, EV-DO Revision B (Rev. B) and DO Advanced. EV-DO Rev. A, widely deployed in the U.S. and worldwide, is an IP-based low latency, packet data only solution, with downlink (DL) peak data rates of 3.1 Mbps, and average throughputs of 600-1400 kbps; and uplink (UL) peak data rates up to 1.8 Mbps, and average throughputs of 500-800 kbps, in 1.25 MHz carrier. EV-DO Rev. B allows aggregating multiple 1.25 MHz Rev. A channels and improves user data rates to up to 9.3 Mbps in downlink and 5.4 Mbps in uplink in a 5 MHz channel. The next generation EV-DO technology, DO Advanced, will deliver higher performance, data rates of 32 Mbps in downlink and over 12.4 Mbps in uplink in 4x1.25 MHz of spectrum, and will double capacity and cell-edge data rates.

⁸ CDMA Development Group, December 2009

⁹ See Comments of Alcatel-Lucent, GN Docket 09-51, June 8, 2009.

Several CDMA2000 U.S. operators are currently deploying advanced (4G) technologies, such as LTE and WiMAX, which will enable them to deliver next-generation broadband applications that require greater speeds and network performance and will potentially radically change the mobile online experience. Sprint Nextel, for example, launched WiMAX services in September 2008, currently offers the services in 27 markets nationwide and plans to add several markets in 2010. Verizon Wireless is rolling out a nationwide LTE network and will launch the service in 25-30 markets in 2010 covering over 100 million people and reaching its entire 3G footprint, or 95 percent of the population, in 2013.

The next-generation 3G and 4G systems will take the broadband Internet services to the next level with potential to revolutionize whole industries. Consumers and enterprises will benefit from more robust integrated multimedia services and there is a tremendous potential for machine-to-machine (M2M) mobile communication which will enable the introduction of a new class of specialized products for health-care monitoring, appliance and energy maintenance, and vehicle-to-vehicle communication, just to name a few applications. This means that there will be many new players in the mobile broadband marketplace providing these niche products. CDMA2000 operators already have been collaborating with many partners to offer these services. For example, Sprint Nextel supports Amazon's Kindle electronic book reader, and Verizon Wireless and Qualcomm announced a joint venture to provide M2M wireless communications and smart services offerings across a wide variety of market segments, including healthcare, manufacturing, utilities, distribution and consumer products.¹⁰ CDG members also

¹⁰ Verizon Wireless, "Verizon Wireless and Qualcomm Announce Joint Venture to Provide Advanced M2M Solutions," press release, July 28, 2009. <http://investor.verizon.com/news/view.aspx?NewsID=1001>

support “smart grid” initiatives, which apply advanced communications, information technology, distributed sensing, and comprehensive data management to the nation’s electric grid.

With the emergence of new technologies, mobile broadband has a tremendous potential to drive significant new growth in Internet usage and applications, but it also faces market and technical challenges that must be addressed if it is to deliver on its promise. CDG urges the Commission to maintain the regulatory flexibility that has been—and continues to be—fundamental to the ability of carriers to manage their networks, respond to market conditions and opportunities, and that is an important prerequisite for significant investment and innovation.

III. THE CHALLENGES FACING THE WIRELESS INDUSTRY REQUIRE REGULATORY FLEXIBILITY, NOT REGULATORY MANDATES

A. The Success of Wireless Broadband Is Driving a Capacity Crisis

The substantial growth of wireless data will pose significant challenges as network resources become more congested. As FCC Chairman Julius Genachowski has noted, “the demand on our commercial mobile spectrum is on a course to outstrip the supply.”¹¹

The use of mobile data enabled by broadband technologies has been growing exponentially. Strategy Analytics estimates that the number of applications downloaded to mobile phones increased nine-fold over the past two years. The Pew Research Center found that usage of mobile devices to access the Internet increased 73 percent in the sixteen months between January 2008 and April 2009, and that nearly one-fifth of

Americans use mobile devices to access the Internet.¹² Accordingly, operators have seen their data traffic grow at a staggering rate. Verizon Wireless' data traffic grew seven-fold in two years, between 2006 and 2008. Over the last three years, AT&T has seen a 5000 percent increase in the data traffic on its network, and has experienced significant network overload as a result, almost entirely due to higher broadband use.¹³ Consumers are increasingly using mobile devices to access popular Internet applications. For example, as of October 2009, Facebook had 65 million mobile users, compared to 6 million just one year earlier, and Amazon reported that during the 2009 holiday season, it sold more electronic books for the Kindle than it did hard-copy books.^{14,15} Nor does this trend show any signs of abating; over the next five years, spectrum usage is expected to see an additional 4500 percent growth.¹⁶ Verizon Wireless expects that the data traffic will increase more than 1000 times by 2014 and Cisco forecasts that mobile data will grow at 131 percent per year for the next five years, exceeding 2 Exabytes by 2013.¹⁷

Given such growth, additional spectrum – CTIA estimates up to 800 MHz for broadband wireless services – will obviously be needed in the relatively near future. This sentiment has been echoed recently by the Department of Justice, which noted that it is critical for the Commission to give priority to making spectrum available to wireless broadband providers.¹⁸

¹¹ Prepared remarks of FCC Chairman Julius Genachowski, FCC Open Agenda Meeting, December 16, 2009.

¹² Wireless Internet Use, July 202, 2009, www.pewinternet.org/Reports/2009/12-Wireless-Internet-Use.aspx

¹³ Statement of Kris Rinne at the Broadband Workshop.

¹⁴ Marketers Salivating Over Smartphone Potential,” October 21, 2009,

http://www.usatoday.com/tech/news/2009-10-20-social-network-smartphone_N.htm

¹⁵ <http://www.signonsandiego.com/news/2010/jan/10/year-tablet/staff/mike-freeman/>

¹⁶ ABI cite

¹⁷ See Cisco (2009b), “Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update,” 29 January 2009

¹⁸ Ex Part Submission of the United States Department of Justice, GN Docket 09-51, January 4, 2010.

The CDG notes that a solution to the spectrum shortage problem is not imminent. Any international or domestic reallocation of spectrum to serve wireless broadband needs is many years away at best. In the interim, it is more important than ever that operators have the flexibility to manage their networks in the most efficient way possible. Without the freedom to control the shared spectrum resource, operators will not be able to provide the quality of service that customers expect. The Commission must allow operators to manage their network and spectrum resources efficiently. Limiting carriers' ability to respond to the unique demands of the wireless environment will exacerbate the capacity shortage now facing the industry.

B. Wireless Networks Are Different From Wireline and Have Unique Network Management Issues That Must Be Considered

The CDG urges the Commission to recognize and accommodate the very different situations that face wireline and wireless companies. Operators in a wireless environment function very differently as compared to a wireline network. The CDG believes that this distinction is critical and requires the FCC to provide even more flexibility for reasonable network management to wireless carriers in order to avoid any adverse consequences on the growth and development of wireless broadband.¹⁹

As the FCC notes in the NPRM, there are technological, structural and operational distinctions that need to be considered when looking at Internet rules in a fixed versus a mobile arena.²⁰ This distinction has been noted as well during the FCC's Open Internet Workshop on Broadband Network Management.²¹ In a presentation made by Verizon, the company noted that wireless broadband is more complex than wireline in the

¹⁹ NPRM at ¶ 148.

²⁰ NPRM at ¶ 158.

engineering and management of the network.²² That presentation set out several notable characteristics that warrant attention to be paid to the unique network operation issues to be considered when looking at mobile broadband. There are substantial issues with regards to radio signals fading, interference, mobility management and traffic patterns.²³

The presentation noted further the challenges that arise given that air interface bandwidth is constrained due to the fact that spectrum is a limited resource and there is only a fraction of bandwidth available as compared with a wireline environment.²⁴ This is complicated by the fact that radio spectrum is a shared resource of finite capacity at any given moment in time; there is thus a trade off in that the bandwidth/capacity one customer uses takes away from the bandwidth/capacity available to another user.²⁵

In particular, management of RF fading is one of the biggest challenges facing wireless broadband providers, and arises out of the constant rise and fall of transmission rates in a wireless network.²⁶ According to Verizon's presentation, the best time to transmit is when there is a high modulation index while the worst time is during a low modulation index.²⁷ This results in the scheduler automatically delaying a packet to wait for higher modulation.

CDMA broadband technologies are very efficient in the recovery of information from the signals transmitted by applying a combination of modulation and demodulation circuits, forward error correction coding, transmitter power control and handoff techniques that ensure that the handset is always using the best available base station.

²¹ Technical Advisory Process Workshop on Broadband Network Management, held December 8, 2009.

²² See presentation made by Tom Sawanobori, Verizon, FCC December 8, 2009 workshop.

²³ Id.

²⁴ Id.

²⁵ Id.

²⁶ Id.

²⁷ Id.

Effective management of power levels, therefore, is critical for CDMA systems to achieve the maximum utilization of spectrum and capacity.²⁸

To ensure high-quality network performance, wireless providers employ a range of measures to track the constantly changing and complex traffic and power management issues. These measures seek to deal with the distinct nature of a wireless network, which must function in a dynamic manner to address unique spectrum-based bandwidth constraints with the additional challenge of serving a diverse range of devices that support a range of functions.²⁹ This is more challenging in a wireless environment given that voice and data services must share the same bandwidth and wireless networks respond to the shifting usage patterns of a mobile customer base.³⁰

C. The FCC Must Avoid Requirements That Could Adversely Affect the Growth and Development of Wireless Broadband

In the NPRM, the FCC seeks comment as to the application of a nondiscrimination principle to wireless services and the extent to which a prohibition on discrimination, subject to reasonable network management, should be implemented for wireless carriers.³¹ The CDG believes that the imposition of network neutrality or nondiscrimination provisions will have a negative effect on network operation, management, reliability, and security, and thus would undermine innovation as well as investment.

²⁸ See Comments of Qualcomm Incorporated, *In the Matter of Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile, and Satellite Frequency Bands*, ET Docket No. 03-237, April 5, 2004.

²⁹ See Comments of AT&T, *In the Matter of a National Broadband Plan for Our Future*, GN Docket No. 09-51, page 120. .

³⁰ *Id.*

³¹ NPRM ¶ 172

The CDG believes that carriers should be able to employ network management techniques in order to maintain appropriate quality of service, as noted above. Managed networks increase consumer choice, and also protect subscribers and ensure that they have access to desired services during periods of congestion. Non-discrimination requirements or strict network neutrality provisions would lead to inefficiencies in network design and operation and could adversely impact network security functions. It could also reduce or distort further investment in broadband systems, as network operators may have less incentives for investments if they will not be able to deploy networks that meet their customers' high standards, including standards for reliability and quality of service. The CDG believes that network neutrality provisions in a wireless environment are unnecessary, because market forces will correct for carriers that block users or applications, or which do not allow users the degree of freedom that they desire.

V. CONCLUSION

While the CDG supports the FCC goals to promote the use of the Internet and development of advanced, high-quality broadband services, we believe that rules that limit wireless operators' flexibility to manage their networks would stifle the growth witnessed in the industry and significantly limit the benefits that the services bring to the citizens and businesses in the United States. Further, it will be essential for the FCC to address the issue of spectrum scarcity and the looming spectrum capacity crisis. To that end, the CDG looks forward to working with the FCC to address further any examination of how to identify and maximize spectrum resources to sustain broadband growth in the United States.

Respectfully submitted

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A handwritten signature in black ink, appearing to read 'Perry LaForge', with a long horizontal stroke extending to the right.

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