

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
International Comparison and Consumer)	
Survey Requirements in the Broadband Data)	
Improvement Act)	GN Docket No. 09-47
)	
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)	GN Docket No. 09-137
Such Deployment Pursuant to Section 706 of)	
the Telecommunications Act of 1996, as)	
Amended by the Broadband Data)	
Improvement Act)	
)	

**COMMENTS - NBP PUBLIC NOTICE # 6
OF
T-MOBILE USA, INC.**

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TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY	1
II.	BECAUSE OF THE EXTRAORDINARY GROWTH PROSPECTS FOR MOBILE BROADBAND, CURRENT SPECTRUM ALLOCATIONS ARE NOT ADEQUATE TO SUPPORT NEXT-GENERATION BUILD- OUTS	4
A.	The Commission and Mobile Providers Must Address Increasing Consumer Demand for Bandwidth.....	5
B.	Although T-Mobile Uses Several Tools to Implement Its Broadband Vision, Spectrum Remains the Fundamental Building Block That is Essential to Competition	8
C.	Substantial Additional Spectrum Is Necessary for Licensed Mobile Broadband	12
III.	FOR MOBILE WIRELESS BROADBAND, THE FCC SHOULD FOCUS ON SPECTRUM BANDS THAT ARE CONTIGUOUS AND HARMONIZED INTERNATIONALLY.	13
A.	The Commission and NTIA Should Make a Spectrum “Down Payment” by Mid-2012.....	14
B.	After the Spectrum Down Payment, Additional Spectrum Should Be Made Available Rapidly To Meet Future Demand.....	16
IV.	MARKET MECHANISMS AND IMPROVED OVERSIGHT OF WIRELESS INPUTS WILL OPTIMALLY MOVE SPECTRUM ALLOCATIONS TO THEIR HIGHEST AND BEST USE.	17
V.	CONCLUSION.....	20

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I. INTRODUCTION AND SUMMARY.

T-Mobile USA, Inc. (“T-Mobile”) submits these comments in response to the above-captioned public notice on spectrum for broadband.¹ The Commission seeks “additional comment on the fundamental question of whether current spectrum allocations, including but not limited to the prime bands below 3.7 GHz, are adequate to support near and longer-term demands of wireless broadband.”²

¹ See FCC Public Notice, *Comment Sought on Spectrum for Broadband, NBP Public Notice # 6*, GN Docket Nos. 09-47, 09-51, 09-137, DA 09-2100 (Sept. 23, 2009) (“*Public Notice # 6*”).

² *Id.* at 1.

T-Mobile's answer to this fundamental question is that current spectrum allocations are not sufficient to support the demands of mobile broadband, especially in the longer term. Chairman Genachowski highlighted this need in his recent speech to CTIA:

Counting last year's 700 MHz auction, the FCC in recent years has authorized a 3-fold increase in commercial spectrum. The problem is many anticipate a 30-fold increase in wireless traffic....I believe one of the FCC's highest priorities is to close the spectrum gap.³

The "spectrum gap" is an apt expression of the challenge facing the Commission, the mobile industry, and the public. Today's service, technology, and equipment options are dizzying—and the capabilities and applications that will be available to wireless customers in five years will be even more advanced and data-driven. Every indication is that consumer demand for mobile broadband will continue to explode as customers demand access to the Internet, video, and other data-rich applications on smartphones, laptops, and netbook devices. But, as the FCC Chairman observed, the bandwidth needs of the new devices and applications are increasing far more rapidly than the spectrum available to support them.⁴

To close the spectrum gap, the Commission should commit to allocating and auctioning an additional 800 MHz of spectrum for commercial mobile broadband use

³ Hon. Julius Genachowski, Chairman, FCC, "America's Mobile Broadband Future," prepared remarks, International CTIA Wireless I.T. & Entertainment, San Diego, CA, at 5 (Oct. 7, 2009) ("*Genachowski Remarks*").

⁴ See, e.g., 3G Americas, *3GPP Technology Approaches for Maximizing Fragmented Spectrum Allocations* (July 2009) at 18 ("*3GPP Technology Approaches*"). See also Comments of CTIA – The Wireless Ass'n at 7, A National Broadband Plan for Our Future, GN Docket No. 09-51 (June 8, 2009) ("*CTIA Broadband Comments*").

throughout the United States, as CTIA recommends.⁵ Such an amount of spectrum may appear vast, but is clearly in line with international recommendations.⁶ T-Mobile recognizes that the identification and allocation process is complicated and time-consuming. The urgent need for additional commercial bandwidth in the United States, however, requires the Commission and the National Telecommunications and Information Administration (“NTIA”) to work together to reallocate for commercial use and auction within the next two to three years at least 25 MHz of contiguous spectrum located in the 1755-1810 MHz government band, which can be paired with the existing commercial allocation of 25 MHz at 2155-2180 MHz (the “extended” AWS-3 band). This “down payment” totaling 50 MHz of commercial spectrum by mid-2012, to be followed by a substantial additional commercial allocation by 2015, will help to ensure that the United States will have access to sufficient spectrum, an essential ingredient for our continued global leadership in innovation and technological advances. As part of this process, Congress, together with the Commission and NTIA, should enhance the procedures for federal agencies to identify spectrum appropriate for commercial use and to relocate existing federal users expeditiously.

In addition to making more spectrum available for commercial broadband use, the Commission must lead the way in ensuring that spectrum is put to its highest and best use for the American public. Most importantly, the Commission should continue to rely on

⁵ See Ex Parte Letter from Christopher Guttman-McCabe, V.P., Regulatory Affairs, CTIA – The Wireless Ass’n, to Chairman Julius Genachowski, and Commissioners Copps, McDowell, Clyburn, and Baker, FCC, GN Docket No. 09-51, at 1-3 (Sept. 29, 2009) (“CTIA September 29 Ex Parte”).

⁶ See ITU, *Estimated Bandwidth Requirements for the Future Development of IMT-2000 and IMT-Advanced*, Report ITU-R, M.2078, at 25 (2006) (“*ITU Estimated Bandwidth Requirements*”).

market-based mechanisms for assigning and transferring spectrum. These mechanisms include advanced auction methodologies, flexibility in secondary markets, and, when spectrum is not auctioned, spectrum fees or other methods of introducing market discipline.⁷ At the same time, the Commission should provide regulatory certainty for the mobile marketplace and move aggressively to prevent harmful interference among wireless services.

II. BECAUSE OF THE EXTRAORDINARY GROWTH PROSPECTS FOR MOBILE BROADBAND, CURRENT SPECTRUM ALLOCATIONS ARE NOT ADEQUATE TO SUPPORT NEXT-GENERATION BUILD-OUTS.

The Commission asks whether current spectrum allocations can support “next-generation build-outs and the anticipated surge in demand and throughput requirements.”⁸ As discussed below, the answer is “No.” Although T-Mobile is making its best efforts to meet anticipated demand and to plan for future requirements, the spectrum now available to the mobile industry is not sufficient to satisfy growing demand for data.

⁷ The Broadband Task Force’s initiative in discussing ways to “recover” broadcast spectrum is an innovative example of driving marketplace solutions worthy of serious evaluation and consideration. See Kim McAvoy, *FCC Floats Cash-For-TV-Spectrum Scheme*, TVNewsCheck (Oct. 21, 2009), available at <http://www.tvnewscheck.com/articles/2009/10/21/daily.4/> (last visited Oct. 23, 2009) (reporting that Blair Levin, Executive Director, Omnibus Broadband Initiative, met with the board of the Association for Maximum Service Television and discussed the possibility of broadcasters “returning their spectrum in exchange for a share in the billions of dollars that would come from the auction of the spectrum to the wireless industry”).

⁸ See *NBP Public Notice # 6* at 4.

A. The Commission and Mobile Providers Must Address Increasing Consumer Demand for Bandwidth.

As Chairman Genachowski and others have observed, U.S. consumers are demanding new mobile broadband applications and mobile smartphone devices that access the Internet and require substantial bandwidth.⁹ “Mobile data usage is not just growing, it’s exploding.”¹⁰ One analyst has found:

Rising from a nationwide total of just 600 gigabits per second in 2000, consumer wireless bandwidth rocketed to 325 terabits per second by the end of 2008. This was good for a per person leap to more than 1 megabit per second from just 2 kilobits in 2000, a 500-fold rise in eight years. Wireless bandwidth began the decade a paltry one-tenth that of residential [DSL and cable modem]. But wireless grew so fast in just the last few years that it was rapidly approaching residential bandwidth in 2008, when each delivered more than a megabit per capita.¹¹

Other sources confirm that mobile data usage and demand are growing dramatically.¹² This increased usage is a hallmark of a successful, dynamic mobile ecosystem for consumers and providers. Today’s mobile ecosystem provides an open platform for these new applications and devices to flourish, and demand in the future is predictably going to exceed current spectrum capacity. For example, in the last two years, some of the most advanced handsets in the world have been launched in the United

⁹ See *Genachowski Remarks* at 3, 5; see also CTIA September 29 Ex Parte at 6-7.

¹⁰ *Genachowski Remarks* at 5.

¹¹ Bret Swanson, *Bandwidth Boom: Measuring U.S. Communications Capacity from 2000 to 2008*, *Entropy Economics*, at 3 (June 24, 2009).

¹² See, e.g., Chetan Sharma, *Managing Growth and Profits in the Yottabyte Era*, Chetan Sharma Consulting, at 8-9 (2009), available at http://www.chetansharma.com/Managing_Growth_and_Profits_in_the_Yottabyte_Era.pdf (last visited Oct. 22, 2009) (noting that “[a]s the percentage of smartphone subscribers grow, so does the traffic – by leaps and bound[s]” and that dramatic growths in data traffic are also the result of increasing use of aircards and netbooks) (emphasis in original).

States, including the T-Mobile myTouch™ 3G, the T-Mobile G1™ with Google™, Apple's iPhone 3G, Samsung's Instinct, the Motorola Cliq™, four new Research In Motion Blackberry devices, and the Palm Pre.¹³ Consumers are gaining powerful mobile access to the Internet through these devices, other smartphones, aircards, and netbooks.¹⁴ Consumers are enthusiastically using the new capabilities and applications available over these devices. In the past year alone, consumers have downloaded about 2 billion wireless applications on their mobile devices.¹⁵

The success of mobile broadband comes at a price, however. As consumers use advanced mobile devices for more sophisticated purposes, their wireless bandwidth demands increase as well. At the global level, Cisco estimates that mobile data traffic will increase **66 times** between 2008 and 2013.¹⁶ This is consistent with T-Mobile's experience on a per-device basis. As the Commission has noted, since T-Mobile began offering its G1™ smartphone, customers of that device use, on average, **50 times** the data

¹³ See *CTIA Broadband Comments* at 7.

¹⁴ *Id.* at 3. Third party development of mobile applications has likewise boomed. Consumers can choose among tens of thousands of mobile applications from a range of online application stores, including the Android Market, the iTunes App Store, and the Palm Software Store. See *CTIA Broadband Comments* at 7-8.

¹⁵ See, e.g., Apple Press Release, *Apple's App Store Downloads Top Two Billion: More Than 85,000 Apps Now Available for iPhone & iPod Touch* (Sept. 28, 2009), available at <http://www.apple.com/pr/library/2009/09/28appstore.html> (last visited Sept. 30, 2009).

¹⁶ See *3GPP Technology Approaches* at 18., citing *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update* (Jan. 29, 2009), available at http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html (last visited Oct. 16, 2009) (noting that “[g]lobally, mobile data traffic will double every year through 2013, increasing 66 times between 2008 and 2013”).

of the average T-Mobile customer.¹⁷ Neville Ray, T-Mobile's Senior Vice President of Engineering Operations, analyzed data usage by the G1 from the network perspective at a Commission staff workshop:

[O]ne of the key issues that we see...specifically in the U.S., is that the ongoing deployment and success of wireless broadband deployment hinges on more spectrum being made available in a number of bands. If you look at the penetration rates of spectrum that's available for commercial services today in the U.S., it's extremely high. The demand from consumers is ever-growing and ever-burgeoning...***As an example, the G1 product that we launched last year is consuming over 300 megabits per month. It's phone-like...but driving extreme usage on the network.***¹⁸

Significantly for the future, customers of T-Mobile's webConnect™ USB Laptop Stick use, on average, **200 times** the data of the average T-Mobile voice customer. With even higher-bandwidth applications such as over-the-top Internet video (e.g., YouTube, Hulu) increasingly in demand, bandwidth demands will continue to skyrocket.¹⁹

¹⁷ See NBP Public Notice # 6 at 2; see also *T-Mobile: G1 Users Use Data in Record Numbers*, Wireless Week (Apr. 1, 2009), available at <http://www.wirelessweek.com/News-CTIA-2009-T-Mobile-G1-Users-Data-Record-040109.aspx> (last visited Sept. 30, 2009).

¹⁸ National Broadband Plan Workshop: Wireless Broadband Deployment – General, Transcript, GN Docket 09-51, at 12-13 (Aug. 12, 2009) (“Aug. 12 Wireless Tr.”) (Comments of Neville Ray, T-Mobile) (emphasis added). Transcripts of other workshops mentioned herein are available in GN Docket No. 09-51 and are short-cited by the date and topic of the workshop. See also *3GPP Technology Approaches* at 18.

¹⁹ In addition to the massive growth of mobile data services and applications, mobile voice traffic also is growing, driven by wireline substitution, especially as mobile voice plans become effectively unlimited with more generous service plans and calling circles. Also, as noted in a recent study by the New York Law School Advanced Communications Law & Policy Institute, “[W]ireless broadband requires ample spectrum to be deployed on the scale needed to enable” services and benefits like smartphone applications for telemedicine and smart grid technologies and, as a result, “[m]any stakeholders, including the FCC, agree that additional swaths of spectrum are needed.” *Barriers to Broadband Adoption*, Report to the Federal Communications Commission, Advanced Communications Law & Policy Institute, New York Law School, at 3 (Oct. 2009), available at

B. Although T-Mobile Uses Several Tools to Implement Its Broadband Vision, Spectrum Remains the Fundamental Building Block That is Essential to Competition.

To meet consumer demand for bandwidth-rich mobile services and devices, T-Mobile is aggressively expanding the scope and robustness of its mobile broadband network, reaching “more of the consumers in the U.S., driving new competition, and...a lot of innovation.”²⁰ This network development will fuel T-Mobile’s vision of providing a wide variety of innovative products for its customers that help them stay connected through Internet applications, social networks, e-mail, and voice. Spectrum availability is the key to ensuring a competitive landscape for wireless carriers as the United States moves into a dynamic mobile broadband environment. T-Mobile’s own experience with 3G deployment demonstrates that delays in the assignment and deployment of additional spectrum by the government can put competitors behind in rolling out competitive services. T-Mobile is working furiously to catch up—and projects that by the end of 2009, its robust 3G network will cover 200 million POPs. However, the Commission and policymakers need to be mindful that as mobile providers move to 4G, lagging spectrum deployment could undermine competition. The Commission, working with the rest of the United States government, must make enough spectrum available to ensure adequate consumer choice remains in the longer term.

In the meantime, T-Mobile will continue to make investments in even more spectrally efficient enhanced 3G technologies such as HSPA+, which we intend to deploy on a broad national basis in 2010. This technology, while technically not 4G, could make

http://www.nyls.edu/user_files/1/3/4/30/83/ACLP%20Report%20to%20the%20FCC%20-%20Barriers%20to%20BB%20Adoption.pdf (last visited Oct. 22, 2009).

²⁰ See Aug. 12 Wireless Tr. at 12

T-Mobile the operator with the highest data speeds in the largest footprint in 2010.

T-Mobile's roughly \$10 billion of expenditures in 3G to date (with further significant investments in 2010 and beyond) will ensure that over 200 million Americans have access to high speed wireless broadband from T-Mobile in the very near term.²¹

T-Mobile deploys its network based on plans derived from proprietary models and forecasts. Acquisition of more spectrum is a vital part of T-Mobile's planning in the near term and to meet future demand. In particular, T-Mobile's proprietary spectrum model considers multiple inputs in order to determine how, in a given market, T-Mobile's spectrum is being utilized and how that market's future spectrum requirements are trending. The spectrum model helps determine whether deployment of more base stations ("cell splits") is necessary when available spectrum is approaching "exhaustion" or full utilization. Inputs to the spectrum model include:

- Spectrum depth;
- Current traffic patterns;
- Capital expenditures per site.
- Site lease and backhaul estimates;
- Technology related parameters related to characteristics of the air interface technology (*e.g.*, GSM, UMTS) in use or planned, such as throughput and technology migration considerations;

²¹ See Lynette Luna, *Will T-Mobile USA Become the Dark Horse Mobile Broadband Leader?*, Fierce Wireless (Sept. 20, 2009) available at <http://www.fiercewireless.com/story/Will-T-Mobile-Usa-Be-Dark-Horse-Mobile-Broadband-Leader/2009-09-21>. See also Peter Jarich, *AT&T & LTE vs. T-Mobile & HSPA+ = Fight!*, Fierce Wireless (Oct. 15, 2009), available at <http://www.fiercewireless.com/story/t-lte-vs-t-mobile-hspa-fight/2009-10-15#> (last visited Oct. 18, 2009).

When T-Mobile's network in a market approaches full utilization, T-Mobile has three basic options for continuing to provide quality service for its customers:

- Increasing available capacity per cell sector (*e.g.*, through cell splits);
- Deploying more spectrally efficient equipment; and
- Adding spectrum.

As 3G Americas has observed, “[o]perators cannot pick and choose among these options, but must invoke all of them in the hunt for capacity.”²² However, each option has practical limitations, as discussed below.

Cell Splits: Although creating a more robust network through cell splits is perhaps the most common way of increasing mobile network capacity, cell splits require significant investments. More fundamentally, technical and operational limits restrict how many splits can take place in a given market, and such splits “reach a point of diminishing returns if the task consists solely of cell splitting an operator’s existing frequencies.”²³ To the extent that cell splits require collocating cell sites or siting base stations in new locations, they are hampered in many areas by local governments’ approval processes. This is an important reason that T-Mobile strongly supports CTIA’s pending petition for a federal “shot clock” for collocation and other tower siting requests.²⁴ It is also worth noting that one factor affecting the number of cells needed for

²² *3GPP Technology Approaches* at 19.

²³ *Id.*

²⁴ See Petition for Declaratory Ruling of CTIA, *Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt Under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance*, WT Docket No. 08-165 (July 11, 2008) (“*CTIA Shot Clock PDR*”).

coverage is the frequency of the spectrum a carrier utilizes, with higher frequency bands requiring more cell sites than lower frequency bands. T-Mobile holds all of its spectrum licenses in the broadband PCS (1850-1990 MHz) and AWS (1710-1755 MHz and 2110-2155 MHz) bands, which are upper frequencies.

Increasing Spectral Efficiency: Deploying technology that improves spectral efficiency plays an important role in helping to meet customer demand. T-Mobile has both the need and the incentive to deploy those technologies and use spectrum as efficiently as possible.²⁵ But T-Mobile agrees with Alcatel-Lucent that, even while the telecommunications industry works to improve spectral efficiency, spectrum usage is growing at such a rate that, without additional large blocks of spectrum, the industry will not be able to keep up.²⁶ At the same FCC broadband workshop at which Alcatel-Lucent's representative made this observation, a Qualcomm representative stated that a technological limit is approaching for which more spectrum is the only solution.²⁷ The limits to spectral efficiency exist regardless of mobile broadband technology. As discussed above, T-Mobile currently is deploying HSPA+, which in terms of spectral efficiency is not significantly different from the Long Term Evolution ("LTE") technology soon to be deployed by AT&T, Verizon and others, or the WiMax being deployed by Clearwire, when judged in reference to 2x5 MHz channels. Whichever

²⁵ In fact, through such technologies as Unlicensed Mobile Access ("UMA") and IP Multimedia Subsystem ("IMS"), T-Mobile seeks to increase efficiency by using unlicensed spectrum for its mobile services.

²⁶ See Aug. 13 Technology/Wireless Tr. at 26 (statement of Tom Anderson, Alcatel-Lucent).

²⁷ See *id.* at 17-18 (statement of Scott Corson, Qualcomm).

broadband path a carrier chooses, there is no roadmap to any significant advancement in spectral efficiency beyond what is available today or in the next several years.

Adding Spectrum: Like most other mobile providers, T-Mobile routinely engages in spectrum license assignments, leases, partitioning, and swaps to obtain usable spectrum, but these efforts alone cannot meet foreseeable demand. Outside of acquisitions, the only way for more spectrum to become available to commercial providers is for the Commission to allocate it for licensed commercial use and to assign it. When the Commission has made spectrum available with reasonable service rules, T-Mobile has made major expenditures to obtain it—most recently by acquiring large swathes of spectrum in the AWS auction for over \$4.18 billion.

C. Substantial Additional Spectrum Is Necessary for Licensed Mobile Broadband.

T-Mobile’s analyses indicate that the only way to close the spectrum gap between available commercial spectrum and expected consumer demand is for the Commission to license more spectrum as quickly as possible. CTIA’s proposal that an additional 800 MHz of spectrum be made available for commercial licensed mobile service is premised on the pace of technological development and consumer adoption of data services. As CTIA points out, today the United States currently has about 410 MHz assigned for commercial use and only 50 MHz of potentially usable spectrum in the U.S. “spectrum pipeline.”²⁸ This stands in stark contrast to spectrum needs projected internationally. The International Telecommunication Union (“ITU”) estimated in 2006 that commercial wireless will need a total allocation of 1300 MHz per country by 2015, to meet the

²⁸ See *NBP Public Notice # 6* at 5; CTIA September 29 Ex Parte at 16-17.

demand expected from use of mobile broadband devices.²⁹ In 2007, the NGMN Alliance considered the ITU's estimates and determined that, for ITU Region 2 (the Americas), between 550 MHz and 1000 MHz of net *additional* spectrum would be required.³⁰ Based on those estimates, T-Mobile supports CTIA's request for an additional 800 MHz of spectrum.

To preserve the innovation thriving in the vibrant mobile marketplace, the Commission must license substantial amounts of new spectrum to commercial mobile providers as quickly as possible. Mobile providers cannot meet consumers' burgeoning demand for bandwidth without additional spectrum to support their wireless platforms.

III. FOR MOBILE WIRELESS BROADBAND, THE FCC SHOULD FOCUS ON SPECTRUM BANDS THAT ARE CONTIGUOUS AND HARMONIZED INTERNATIONALLY.

Providing the mobile ecosystem with additional, usable, licensed spectrum is the single most important step that the Commission can take to close the spectrum gap in light of exploding consumer demand for bandwidth.³¹

²⁹ See *ITU Estimated Bandwidth Requirements* at 25.

³⁰ See *3GPP Technology Approaches* at 20, citing NGMN Alliance, *Spectrum requirements for the Next Generation of Mobile Networks* (June 20, 2007) at 22, available at http://www.ngmn.org/uploads/media/Spectrum_Requirements_for_the_Next_Generation_of_Mobile_Networks.pdf (last visited Oct. 18, 2009). NGMN describes itself as "an alliance by a group of leading mobile operators, industrial partners, and academic advisors to provide a vision for technology evolution beyond 3G for the competitive delivery of broadband wireless services." *Id.* at 4.

³¹ See *NBP Public Notice # 6* at 5; see also, e.g., Comments of T-Mobile at 13-18, *A National Broadband Plan for Our Future*, GN Docket No. 09-51 (June 8, 2009) ("T-Mobile Broadband Comments"); Workshop Response of T-Mobile at 4-6, *A National Broadband Plan for Our Future*, GN Docket No. 09-51 (Sept. 15, 2009).

A. The Commission and NTIA Should Make a Spectrum “Down Payment” by Mid-2012.

In its comments on competition and innovation in the wireless marketplace, T-Mobile outlined a practical, multi-step process for the Commission to undertake in cooperation with NTIA to obtain more spectrum for commercial use.³² In terms of deliverables to the American public, T-Mobile urges the Commission and NTIA to make a spectrum “down payment” of 50 MHz in the next two to three years.

Specifically, T-Mobile urges the Commission and NTIA to work together to pair 25 MHz of contiguous spectrum in the 1755-1810 MHz government band³³ with the 25 MHz “extended” AWS-3 band (2155-2180 MHz), with this spectrum to be reallocated in the next year and auctioned and assigned for exclusive commercial use by mid-2012.³⁴ T-Mobile believes that this paired total of 50 MHz is the minimum required for competitive U.S. mobile networks to meet demand in the very near future.³⁵ In addition, the Commission should immediately auction the 700 MHz D Block solely for

³² See Comments of T-Mobile, *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless including Commercial Mobile Services; Fostering Innovation and Investment in the Wireless Communications Market; A National Broadband Plan For Our Future*, WT Docket No. 09-66, GN Docket Nos. 09-157, 09-51 (Sept. 30, 2009) (“*T-Mobile Competition/Innovation Comments*”) at 21-23; see also *T-Mobile Broadband Comments* at 14-18.

³³ The Commission originally considered spectrum at 1755-1850 MHz for advanced wireless services, including 3G, as recently as 2001. See *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems*, Notice of Proposed Rulemaking and Order, 16 FCC Rcd 596 (2001).

³⁴ Without an aggressively-enforced deadline, spectrum reallocation and assignment can be a long-term endeavor. For example, the reallocation and auction of AWS spectrum took more than a decade. See *T-Mobile Broadband Comments* at 17.

³⁵ Commercial 4G broadband implementations such as LTE could begin to be implemented with the 50 MHz of additional spectrum described above.

commercial uses with the auction proceeds directed to fund the buildout and maintenance of a nationwide, interoperable public safety broadband network. The 700 D Block includes paired spectrum that is ideal for 4G and other advanced wireless broadband services. Making this spectrum available for commercial purposes would help enhance the opportunities for the provision of competitive broadband services.³⁶

In addition to the spectrum down payment, the Commission should work closely with NTIA to conduct a rapid, targeted review of federal and non-federal spectrum allocations and uses from 300 MHz to 3.7 GHz.³⁷ The review process should be time-limited and practical: high-level enough to allow current users to gather and submit information in a cost-effective manner, and comprehensive enough to allow the agencies and commercial users sufficient data to identify additional bands most appropriate for reallocation.

³⁶ See Letter from Thomas J. Sugrue, Vice President, Government Affairs, T-Mobile USA, Inc. to Chairman Rick Boucher and Ranking Member Cliff Stearns, Subcommittee on Communications, Technology and the Internet, Committee on Energy and Commerce, U.S. House of Representatives, WT Docket No. 06-150, PS Docket No. 06-229, at 1-3 (Sept. 23, 2009).

T-Mobile also believes that the National Emergency Number Association (“NENA”) proposal to combine the 10 MHz allocated for public safety broadband use with the adjacent D Block 10 MHz, thus creating a 20 MHz block to be auctioned to a commercial entity, depending on how the details are worked out, is potentially a reasonable approach. *See id.* Half of the auction revenue would be placed into a public safety broadband trust as a down payment on public safety access to and use of the network, and the commercial entity would give public safety access to the full 20 MHz commercial block on a priority basis when needed. *See, e.g.*, Statement of Brian Fontes, CEO, NENA, Before the U.S. House of Representatives Subcommittee on Communications, Technology, and the Internet of the Committee on Energy and Commerce, A National Interoperable Broadband Network For Public Safety: Recent Developments, at 3 (Sept. 24, 2009).

³⁷ *See id.* T-Mobile acknowledges the efforts of Senators Kerry and Snowe to move in this direction by introducing S. 649, the Radio Spectrum Inventory Act on March 19, 2009. *See* S. 649, 111th Cong. (2009).

B. After the Spectrum Down Payment, Additional Spectrum Should Be Made Available Rapidly To Meet Future Demand.

After the 50 MHz spectrum down payment discussed above, T-Mobile urges the Commission to move quickly to allocate and auction an additional 750 MHz of spectrum for commercial mobile broadband use throughout the United States for a total of 800 MHz,³⁸ a portion coming from the current government allocations managed by NTIA and a portion from spectrum regulated by the Commission. The spectrum identified should be in blocks that are largely contiguous and globally harmonized to the extent possible, in order to permit greater efficiencies in the production of mobile devices and equipment, with corresponding savings for U.S. mobile users.³⁹ The identified spectrum also should reside below 3.7 GHz to ensure that it can be used economically to deliver mobile broadband services.

Consistent with the Commission's commitment to transparency, it should publish a schedule or roadmap of the planned auctions for licensing this additional spectrum. A roadmap of future auctions would help potential bidders make informed decisions in planning spectrum acquisitions, resulting in a more efficient licensing process. The spectrum should have a path to expeditious and efficient relocation of incumbent users. The Commission should work with NTIA and Congress to adopt enhanced administrative procedures for federal agencies to identify appropriate spectrum and relocate existing federal users expeditiously.⁴⁰

³⁸ See CTIA September 29 Ex Parte at 1-3.

³⁹ See *3GPP Technology Approaches* at 15-18.

⁴⁰ See Spectrum Relocation Improvement Act of 2009, H.R. 3019, 111th Cong. (2009), introduced by Rep. Inslee and co-sponsored by Chairman Boucher and Rep. Upton.

Congress should, if necessary, reallocate spectrum from government and other non-mobile uses to meet the need for a substantial portion of the total 800 MHz of spectrum by 2015. T-Mobile urges the Commission to seek any necessary Congressional action and establish a schedule by which this spectrum would be available for commercial use. In T-Mobile's experience, the identification, reallocation, and licensing of spectrum understandably is a lengthy and complex process. Given the pressing need for additional bandwidth to meet the escalating mobile broadband needs of U.S. consumers, however, a substantial portion of the identified spectrum should be reallocated and ready for auction no later than 2015.

The Commission recently allocated a large portion of spectrum below 698 MHz for use by unlicensed TV band devices.⁴¹ Although unlicensed services have a place in delivering mobile broadband and other wireless applications, today's urgent need is for sufficient spectrum to support current and future demand for licensed wireless services.

IV. MARKET MECHANISMS AND IMPROVED OVERSIGHT OF WIRELESS INPUTS WILL OPTIMALLY MOVE SPECTRUM ALLOCATIONS TO THEIR HIGHEST AND BEST USE.

In general, the Commission should continue to rely on market mechanisms as the best way to ensure that spectrum is put to its highest and best use.⁴² Auctions and well-defined but flexible service rules are generally the best way to ensure that spectrum is used in the most efficient and publicly beneficial manner possible. Accordingly, the Commission should adopt narrowly-tailored regulations to address identified market

⁴¹ See *Unlicensed Operation in the TV Broadcast Bands*, 2nd R&O and Mem. Op. and Order, 23 FCC Rcd 16807 (2008).

⁴² See *NBP Public Notice # 6* at 6.

failures and such regulations should attempt to provide market-based incentives for the use of this fundamental resource.

The Commission's auction mechanisms, first implemented under FCC Chairman Reed Hundt in the 1990s, have gone far to ensure that spectrum is put to its most productive use, and the Commission should explore the use of innovative forms of auctions to distribute this critical resource. For example, when incumbent users occupy spectrum bands to be auctioned, the Commission should consider advanced auction methodologies, such as "two-sided" auctions, that can facilitate band-clearing and simplify transitions to new licensees.⁴³ The Commission also should continue to permit flexible transactions in secondary markets for spectrum.

If segments of the public or discrete areas of the country do not receive adequate mobile service, the Commission should rely on an explicit support mechanism, such as a competitively-neutral, narrowly-defined universal service program, to assist in making mobile service available. Attempts to tailor general service rules to address such situations will limit auction participation, devalue the spectrum, and lead to business failures.

In the case of spectrum that is not licensed using auctions, market incentives to promote the most efficient use of spectrum do not exist. For example, currently

⁴³ See *Amendment of Parts 1, 21, 73, 74, and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Notice of Proposed Rulemaking and Mem. Op. and Order, 18 FCC Rcd 6722, 6820-6822 (2003); *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones*, Notice of Proposed Rulemaking, 4th Further Notice of Proposed Rulemaking and 2nd Further Notice of Proposed Rulemaking, 21 FCC Rcd 9345, 9372 (2006).

broadcasters have little motivation to use spectrum efficiently. In such cases, spectrum fees may be an appropriate way to introduce market discipline and ensure that valuable bandwidth is not squandered.⁴⁴

Regulatory certainty is essential for licensees to plan and optimize their spectrum use. Technical rules need to be clear but incorporate a flexible use standard to permit licensees to adjust to changing consumer demand and to use spectrum as efficiently as possible. The Commission should avoid changing service rules once they are adopted (and especially after the spectrum is auctioned) to mitigate disruption to licensees' expectations for using the spectrum.

By almost any measure, licensed commercial mobile spectrum is used efficiently today, largely because of the reasonable technical rules for mobile services and the intense competition that characterizes the mobile marketplace. By contrast, in other service bands where, because of restrictive or unrealistic service rules or the historic development of service in the band, spectrum may not be put to its best uses.⁴⁵ T-Mobile urges the Commission to look carefully at the service rules and current uses of spectrum for the Wireless Communications Service ("WCS") and the Educational Broadband Service/Broadband Radio Service ("EBS/BRS") to determine whether the associated spectrum can be made more readily usable by a variety of service providers. There also may be other examples worth examining that the Commission should explore.

⁴⁴ The Commission should also examine the TV broadcast frequencies and, where feasible, restack channels to open up more contiguous blocks of spectrum. *See also supra* note 7.

⁴⁵ *See NBP Public Notice # 6* at 6.

The Commission also should protect the highest and best use of spectrum by preventing harmful interference among wireless services, as required in Title III of the Communications Act of 1934, as amended (the “Act”).⁴⁶ By preventing such interference, especially for systems in adjacent bands, the Commission will create “the appropriate environment in which multiple technologies can vie for preeminence in the market.”⁴⁷

V. CONCLUSION.

The Commission should move as quickly as it can to close the “spectrum gap” that Chairman Genachowski so clearly identified. This is a critical moment in the history of mobile communications in the United States, particularly as consumers continue to demand faster and higher-bandwidth mobile broadband services. T-Mobile urges the Commission to move aggressively to make more spectrum available for commercial mobile broadband, and to embrace market-based measures that will ensure that spectrum is put to its highest and best use for American consumers. Mobile broadband is the wave of the future and is a good investment for our lagging economy and data-hungry consumers. To keep that growth curve and investment booming for

⁴⁶ See, e.g., Sections 301-303, 309 of the Act, 47 U.S.C. §§ 301-303, 309.

⁴⁷ See *3GPP Technology Approaches* at 28.

consumers, more spectrum is needed, and the U.S. government is uniquely situated to make that happen.

Respectfully submitted,

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