

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

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)	GN Docket No. 09-137
Steps to Accelerate Such Deployment Pursuant to)	
Section 706 of the Telecommunications Act of)	
1996, As Amended)	
)	
International Comparison and Survey Requirements)	GN Docket No. 09-47
In the Broadband Data Improvement Act)	

**REPLY COMMENTS OF QUALCOMM
ON SPECTRUM FOR BROADBAND
IN RESPONSE TO NBP PUBLIC NOTICE #6**

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SUMMARY

Qualcomm is pleased to provide additional input to the Commission as it prepares the National Broadband Plan. No topic will be more important in that plan than spectrum, which is the mother's milk of mobile broadband networks. In these Reply Comments, Qualcomm makes three central points concerning spectrum.

First, the record of this proceeding, similar to the record compiled in response to other FCC requests for comments, demonstrates overwhelming support for the allocation and auction of additional licensed spectrum for mobile broadband. Three trade associations, CTIA, CEA, and TIA, each took this position. Comments of CTIA at 2 Comments of CEA at 6; Comments of TIA at 9. Eight carriers took this same position. Comments of AT&T at i; Comments of Bright House networks at iii; Comments of Clearwire at 5; Comments of MetroPCS at ii; Comments of Sprint Nextel at i; Comments of T-Mobile USA at 2; Comments of US Cellular at 1-2; Comments of Verizon Wireless at 1. Qualcomm and two other vendors also took this position. Comments of Qualcomm at i; Comments of Ericsson at 1-2; Comments of Motorola at i.

No commenter actually took the contrary position—i.e., that mobile broadband demand can be met without an increase in licensed spectrum. MSTV and NAB duck the issue by asking the Commission to consider bands above 3.7 GHz, even though there is no business case for using spectrum at such a high frequency for mobile broadband because of the large number of transmitters which would be required to provide wide area coverage, and by referring to unlicensed and non-exclusive licensed spectrum, which, again, are not suitable technically or economically for wide area wireless networks. Comments of MSTV & NAB at 2, 4. Even so, MSTV and NAB never say that the current allocations are sufficient to keep up with the burgeoning demand. Such a claim would be simply unsupportable.

A few commenters ask for additional allocations of unlicensed spectrum or non-exclusively licensed spectrum. Comments of TIA at 7; Comments of CEA at 5; Comments of Wireless Internet Service Providers Association (“WISPA”) at 17-18. These commenters did not provide any technical or economic analysis as to how unlicensed spectrum or non-exclusively licensed spectrum can be used to provide wide area mobile broadband coverage. As Qualcomm showed in its Comments and in other submissions to the Commission, to cover a wide area, an unlicensed deployment would require far more transmitters than a licensed deployment; a 700 MHz licensed transmitter could cover approximately twenty times the area of an unlicensed transmitter. See Comments of Qualcomm at 32; Charles Jackson, “Unlicensed TV White Space Wireless Cannot Provide Substantial Rural Broadband Access,” (October 22, 2008), attached to Qualcomm Ex Parte Filing in Dockets 04-186 & 02-380. Moreover, mobile broadband technologies designed to cover wide areas require interference protection to ensure that the communications link across a wide area, from the base station to the phone or modem, is maintained. Comments of Qualcomm at 32. For both technical and economic reasons, spectrum licensed on an exclusive basis, not on a non-exclusive basis and not unlicensed spectrum, is required to provide ubiquitous mobile broadband service.

Second, contrary to the claims of two commenters, the Commission should not allocate dedicated spectrum for Smart Grid applications. Cf. Comments of Utilities Telecom Council at iii; Comments of Critical Infrastructure Communications Coalition at 1-2. Rather, as Qualcomm showed in its comments in response to NBP Public Notice # 2, commercial mobile broadband networks, which already cover over 95.6% of the US population, are very well suited for Smart Grid applications, and in setting spectrum policy, the FCC should not allocate additional spectrum for for construction of new dedicated single-purpose Smart Grid-only networks. See

Comments of Qualcomm in Response to NBP Public Notice #2 (filed Oct. 2, 2009). It would take many billions of dollars and a decade or more to build new, Smart Grid-only dedicated networks, and such dedicated networks will never achieve, much less exceed, the coverage, reliability, global harmonization, security, and scalability of existing mobile broadband networks. Smart Grid applications will proliferate much more rapidly and broadly if they leverage the enormous investments already made in commercial mobile broadband networks and the vast ecosystem already supporting these networks, rather than forcing American utility ratepayers to foot the bill for starting from scratch.

Moreover, the construction of dedicated Smart Grid-only networks would entail significant financial and other risks, which would ultimately be passed on to ratepayers, whether or not the utilities actually use all of the capacity on the dedicated networks. In contrast, if Smart Grid applications leverage the existing commercial mobile broadband networks, utilities could purchase only the capacity that they actually need and at competitive rates. Qualcomm's Gobi embedded mobile broadband solution, described at Qualcomm's Comments at 12-13, supports EV-DO Revision A and HSPA in multiple frequency bands. Use of such a solution for Smart Grid applications will allow utilities to choose back and forth between commercial mobile broadband networks, thereby driving down costs. This solution is far more cost effective and less risky for the Smart Grid than using precious spectrum to build expensive dedicated Smart Grid networks.

Further, for Smart Grid applications to proliferate rapidly, ubiquitous and redundant coverage are required. By using a multi-mode, multi-band solution, such as Gobi, utilities would gain access to the combined coverage of today's commercial mobile broadband networks, the redundancy from being able to access multiple networks, and at competitive rates to boot. A

dedicated, Smart Grid-only network would not be able to leverage the coverage of any other network and would not have any redundancy.

Third, the Commission should reject the arguments of Shure Incorporated (“Shure”) seeking both ten years or more, that is effectively an indefinite period of time, and financial compensation before the mostly unlawful users of wireless microphones would have to vacate spectrum. See Comments of Shure at 15-16. The Commission should force wireless microphone users to vacate spectrum far more quickly than that, particularly in the case of 700 MHz spectrum, which the Commission has already allocated and auctioned. In August 2008, the Commission tentatively concluded that it would not allow wireless microphones to operate on the 700 MHz auctioned spectrum (and the spectrum licensed to public safety) after the end of the DTV transition because such operations could cause harmful interference to the operations of the new commercial wireless and public safety licensees. See Notice of Proposed Rule Making, WT Docket Nos. 08-166, 08-167, FCC 08-188, released August 21, 2008 at para. 2. The Commission should move forward as soon as possible to clear all wireless microphones off the auctioned 700 MHz spectrum, as well as the public safety 700 MHz spectrum. As Qualcomm showed in its Comments, spectrum should be auctioned free of encumbrances so that the spectrum can be put to its highest and best use as soon as the auction is over. See Comments of Qualcomm at 25-26. The Commission should not allow wireless microphones to squat on 700 MHz spectrum which was auctioned for over \$19 billion or on spectrum allocated to our nation’s first responders.

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REPLY COMMENTS OF QUALCOMM INCORPORATED

QUALCOMM Incorporated (“Qualcomm”), by its attorneys, hereby submits these Reply Comments in response to the Commission’s NBP Public Notice #6, DA 09-2100, released September 23, 2009, in which the Commission sought comment on the sufficiency of current spectrum allocations, including but not limited to prime spectrum below 3.7 GHz, for purposes of the development of the National Broadband Plan and for related purposes.

In its Opening Comments, Qualcomm provided the Commission with detailed information on some of the types of devices, applications and services which are driving the exponential growth in the demand for mobile broadband, which in turn is driving the need for additional licensed spectrum. Qualcomm then explained the myriad of reasons why additional cleared spectrum should be auctioned with flexible use rights, liberal property rights, a technology neutral regulatory regime, and full protection from interference. Finally, Qualcomm discussed why unlicensed spectrum is not suitable, technically or economically, for wide area

mobile broadband service and why the Commission should not impose overlays or underlays in licensed bands.

In these Reply Comments, Qualcomm shows the consensus among commenters favoring the allocation and auction of additional spectrum; Qualcomm rebuts the requests made by the utility interests for dedicated spectrum for Smart Grid applications; and, Qualcomm opposes wireless microphone manufacturer Shure's contentions that the relocation of wireless microphones from the 700 MHz auctioned spectrum should continue for an indefinite period of time.

I. There Is Overwhelming Support in the Record for the Identification, Allocation, and Auction of Additional Licensed Spectrum for Mobile Broadband

The record of this proceeding, similar to the record of the Commission's related proceeding on innovation in wireless, contains overwhelming support for the identification, allocation, and auction of a significant amount of additional licensed spectrum for mobile broadband. As noted supra, a broad array of trade associations, carriers, and wireless equipment suppliers all expressed similar views on the need for more licensed spectrum. Here is how the trade associations put it: "It is indisputable that we need more spectrum to provide robust and innovative broadband content, applicatiions, and services to all Americans." CEA Comments at 6. "[C]urrent spectrum allocations are insufficient to meet the growing demand for mobile broadband services." CTIA Comments at 2. "TIA agrees with Chairman Genachowski that, given the dramatic increase in demand for terrestrial wireless broadband and the spectrum needs of networks, America is facing a shortage of spectrum allocated to services in which these networks can operate." TIA Comments at 2.

The carriers made similar arguments: "AT&T fully agrees with Chairman Genachowski that a spectrum crisis is looming, and that a shortage of spectrum could be a threat to the future

of wireless broadband service in America.” Comments of AT&T at i. The “current spectrum inventory is insufficient. . .” Comments of Bright House Networks at iii. “Spectrum resources are critical not only for service delivery, but also in the early-development stage. Comments of Clearwire at 5. “Additional spectrum is needed in the near term to meet immediate unsatisfied demands and in the long term to enable carriers to keep pace with an ever-expanding consumer appetite for wireless services.” Comments of MetroPCS at iii. “The success of the National Broadband Plan depends on achieving Chairman Genachowski’s goal of unleashing spectrum for future mobile broadband deployment.” Comments of Sprint Nextel at i. “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.” T-Mobile USA Comments at 2. “[T]he Commission is facing a daunting challenge with relatively little spectrum in the pipeline in the near term. . .” Comments of US Cellular at 1-2. “[S]ignificant allocations of additional spectrum will be needed in the future. In fact, experts predict that demands for commercial spectrum will quadruple over the next ten years.” Comments of Verizon Wireless at 1.

Finally, the comments of equipment manufacturers are no different. “Motorola supports the proposition that significant amounts of additional spectrum are needed to accommodate broadband applications in both the near-term and long-term.” Comments of Motorola at i. “Ericsson has recommended that the Commission take immediate steps to identify new, globally harmonized licensed spectrum for mobile services.” Comments of Ericsson at 1-2.

No one can or did contest that mobile broadband use is exploding, or that the exponential growth in demand can be met without an increase in licensed spectrum. MSTV and NAB accuse the Commission of having a “bias” against the allocation of spectrum above 3.7 GHz for wireless broadband. Comments of MSTV & NAB at 2. There is no bias. Rather, spectrum at such a high frequency is not economically feasible for wireless broadband because of the large number of transmitters which would be required to cover wide areas. Similarly, MSTV and NAB refer to unlicensed allocations, which are not suitable technically or economically for wide area mobile broadband networks. See Comments of MSTV & NAB at 2, 4. Nevertheless, MSTV and NAB never even attempt to claim that the current spectrum allocations are sufficient to keep up with the burgeoning demand for mobile broadband. Such a claim would not pass a straight face test.

Some commenters favored allocation of additional unlicensed spectrum or non-exclusively licensed spectrum. Comments of TIA at 7; Comments of CEA at 5; Comments of Wireless Internet Service Providers Association (“WISPA”) at 17-18. However, as Qualcomm showed in its Opening Comments and in other filings, to cover a wide area, an unlicensed deployment would require far more transmitters than a licensed deployment; a 700 MHz licensed transmitter could cover approximately twenty times the area of an unlicensed transmitter. See Comments of Qualcomm at 32; Charles Jackson, “Unlicensed TV White Space Wireless Cannot Provide Substantial Rural Broadband Access,” (October 22, 2008), attached to Qualcomm Ex Parte Filing in Dockets 04-186 & 02-380. Moreover, mobile broadband technologies require interference protection to ensure that the communications link across a wide area, from the base station to the phone or modem, is maintained. Comments of Qualcomm at 32. For both technical and economic reasons, spectrum licensed on an exclusive basis is required to provide ubiquitous mobile broadband service.

II. The Commission Should Not Allocate Dedicated Spectrum for Smart Grid Applications

Mirroring contentions made in response to NBP Public Notice #2, two commenters from the utility industry, the Utilities Telecom Council and the Critical Infrastructure Communications Coalition, asked the Commission to allocate dedicated spectrum for Smart Grid applications. Comments of Utilities Telecom Council at iii; Comments of Critical Infrastructure Communications Coalition at 1-2. As Qualcomm showed in its comments in response to NBP Public Notice # 2, these requests should be rejected because commercial mobile broadband networks, which already cover over 95.6% of the US population,¹ are very well suited for Smart Grid applications, and it is far more cost effective for Smart Grid applications to leverage the enormous investment in these existing networks than to rely on construction of new, single-purpose networks. See Comments of Qualcomm in Response to NBP Public Notice #2 (filed Oct. 2, 2009).

It would take many billions of dollars and a decade or more to build new, Smart Grid-only dedicated networks. These dedicated networks would never achieve the coverage, reliability, global harmonization, security, and scalability of existing mobile broadband networks. American ratepayers should not be required to foot the bill for the construction and operation of new networks which will be inferior to the commercial mobile broadband networks already on the air. Smart Grid applications can be delivered at far lower costs if utilities take advantage of the massive investments already made in commercial mobile broadband networks. In this regard, Qualcomm's nPhase joint venture with Verizon Wireless is one of many wireless

¹ See Bringing Broadband to Rural America, Report on a Rural Broadband Strategy, released May 22, 2009, at Pgs. 12-13.

industry players working with utilities and others on Smart Grid applications delivered over commercial mobile broadband networks.

As explained in Qualcomm's Comments, Qualcomm has developed an embedded mobile broadband and GPS solution by the name of Gobi, which operates on both EV-DO Revision A and HSPA-based mobile broadband networks. Comments of Qualcomm at 12-13. Gobi is a multi-mode, multi-band mobile broadband solution, which enables a device to work on any of the 3G mobile broadband networks in the US. By using such a solution for Smart Grid applications, utilities would be able to purchase mobile broadband capacity at competitive rates. That is far more cost effective than allocating dedicated spectrum to the utilities so they can build and operate dedicated networks at a massive cost and at the risk that some or most of the capacity on such dedicated networks may go unused. There is no reason to allocate spectrum to utilities for dedicated Smart Grid-only networks given that the utilities can buy just the capacity they need at competitive rates from existing commercial networks.

Moreover, coverage and redundancy are also critical factors weighing against the allocation of dedicated spectrum. Today's commercial mobile broadband networks cover the residences of over 95.6% of the US population, and as explained in Qualcomm's Comments, Qualcomm has developed a satellite-based mobile broadband solution to fill in the coverage gaps. As noted, Gobi supports multiple frequency bands and multiple mobile broadband technologies, thereby allowing utilities to access multiple commercial mobile broadband networks for Smart Grid applications. These solutions do not exist, and will not exist, for dedicated Smart Grid-only networks. Dedicated networks will not have any redundancy and will never attain the combined coverage of multiple commercial mobile broadband networks.

For all of these reasons, Qualcomm urges the Commission not to allocate dedicated spectrum to utilities and instead to consider the emerging demand for Smart Grid applications as yet another driver of demand for mobile broadband applications which will run on commercial mobile broadband networks.

III. The Commission Should Not Allow Wireless Microphones to Squat on the 700 MHz Spectrum

Shure, a wireless microphone manufacturer, effectively asks that wireless microphone users, most of whom are operating the equipment unlawfully, be given ten years or more, that is effectively an indefinite period of time, as well as financial compensation before they would have to move off spectrum. See Comments of Shure at 15-16. This request is totally unfounded. Particularly in the case of 700 MHz spectrum, it is crucial both to the integrity of the Commission's auction program and to the Commission's efforts to improve public safety communications that the Commission order wireless microphones to cease using the 700 MHz band immediately.

In August 2008, the Commission tentatively concluded that it would not allow wireless microphones to operate on the 700 MHz auctioned spectrum (and the spectrum licensed to public safety) after the end of the DTV transition because such operations could cause harmful interference to the operations of the new commercial wireless and public safety licensees. See Notice of Proposed Rule Making, WT Docket Nos. 08-166, 08-167, FCC 08-188, released August 21, 2008 at para. 2. The Commission has not yet issued an order in that proceeding.

The Commission should move forward as soon as possible to clear all wireless microphones off the entire 700 MHz band, both the auctioned 700 MHz spectrum and the 700 MHz public spectrum. The Commission should auction spectrum free of encumbrances so that the spectrum can be put to its highest and best use as soon as the auction is over. See Comments

