Before The
Federal Communications Commission
Washington DC 20554

In the Matter Of	)	
	)	
Fostering Innovation and Investment in the Wireless Communications Market	)	GN Docket No. 09-157
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	

REPLY COMMENTS OF QUALCOMM INCORPORATED

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Dated: November 5, 2009

SUMMARY

The record of this proceeding demonstrates the remarkable extent to which the American wireless industry brings innovative mobile broadband-based technologies, devices, services, and applications to market every single day. The record further shows that these innovations touch upon virtually every aspect of modern American life—including health care, education, energy, public safety, entertainment, and the economy writ large. Mobile broadband networks and devices, using technologies that require licensed spectrum, are the key drivers for all of these innovations.

Likewise, the record reflects widespread support for the allocation and auction of additional licensed spectrum for mobile broadband to enable carriers to keep pace with the burgeoning demand. Large, medium, and small carriers, technology vendors, and public interest groups all emphasized this point in their filings, including: American Legislative Exchange Council at 4; AT&T Comments at 68-69; Cellular South Comments at 4; Clearwire Comments at 10; Comcast Comments at 4-5; CTIA Comments at 68; Ericsson at 14; Google Comments at 4; GSM Assocation at 8-10; Mercatus Center at 1; Metro PCS Comments at iii; QUALCOMM Comments at ii, 27-33; Rural Telecommunications Group Comments at 3; Sprint Nextel Comments at ii; Telecommunications Industry Association Comments at 3; T-Mobile USA Comments at 3-4, 15-17; US Cellular Comments at 27; Verizon Wireless Comments at 138; Vodafone Group Comments at 6. Indeed, no one can seriously claim to the contrary—i.e., that mobile broadband demand can be met without a substantially more licensed spectrum.

On the other hand, although some commenters call for the allocation of additional unlicensed spectrum or the full implementation of unlicensed devices operating in the TV White Space (e.g., Comments of Google at 9-10; Comments of Wireless Internet Service Providers

Association ("WISPA") at 5; Comments of Motorola at 11-12; Comments of Spectrum Bridge at 3-4), those commenters did not submit any data whatsoever to justify the need for more unlicensed spectrum. The Commission should act on the basis of facts, not speculation. The facts are that there is no business case for the use of unlicensed spectrum to cover wide areas and the existing unlicensed allocations are sufficient for local area service. See Charles L. 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. See also Comments of Verizon Wireless at 145.

In the same vein, numerous commenters stressed the technical and economic reasons why the Commission must continue to provide full interference protection for operations on licensed spectrum and not allow unlicensed overlays or underlays in licensed bands. See, e.g., Comments of Verizon Wireless at 132-138; Comments of AT&T at 75-92; Comments of Sprint Nextel at 17-22; Comments of Metro PCS at 42-45; Comments of Ericsson at 21. One commenter, however, asked the FCC to re-open its proceeding on interference temperature, but was unable to support that request with any data. Comments of Google at 22 to 24. There is no basis at all to suggest that operations on licensed spectrum—spectrum which wireless carriers paid billions of dollars at auction to acquire— can tolerate, or should be required to tolerate, interference from unlicensed users.

Furthermore, some commenters asked the Commission to apply new regulations to various aspects of the wireless industry, but they were unable to supply any valid justification for their requests. One commenter attacks the FCC's highly successful auction program and urges the FCC to use the license renewal process effectively to reallocate auctioned spectrum. Comments of Green Flag Wireless, LLC. No one is going to pay billions of dollars in an auction

to buy a spectrum license and then spend billions more to deploy and operate a network if the spectrum can be snatched away at renewal time. Green Flag Wireless makes the wildly incorrect allegation that there are incumbents who sit on spectrum for a decade without using it. Id. at 5. As the record of this proceeding and the Commission's annual reports on the state of competition in the wireless market all reflect, by and large, licensed spectrum gets used as quickly as possible, and the Commissions auction program has been a tremendous success for the American people.

Quite remarkably, another commenter asked the Commission to allow the experimental use of licensed spectrum without the consent of the licensee. Comments of Boeing at 10-13. There is no basis for the Commission to trample over licensee rights. Over the past two decades, Qualcomm has secured many experimental licenses and has always been able to obtain the consent of licensees to conduct its experiments.

In sum, the record of this proceeding shows beyond a shadow of a doubt that the US mobile broadband industry is extraordinarily innovative, and that these innovations are bringing substantial benefits to the American people. To ensure that this success continues, the Commission should focus on identifying, allocating, and auctioning more licensed spectrum for mobile broadband under the Commission's existing regulatory rubric.

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REPLY COMMENTS OF QUALCOMM INCORPORATED

QUALCOMM Incorporated ("Qualcomm"), by its attorneys, hereby replies to the comments filed in response to the Commission's Notice of Inquiry, FCC 09-66, released August 27, 2009. In the Notice of Inquiry, the Commission sought comment on the factors that encourage innovation and investment in wireless communications and to identify concrete steps the Commission can take to support and encourage further innovation and investment. Notice of Inquiry at para. 1.

In these reply comments, Qualcomm focuses on three points. First, the record confirms that additional licensed, not unlicensed, spectrum for mobile broadband is essential to meet the exponentially growing demand for the wide variety of innovative mobile broadband-based technologies, devices, services, and applications. Second, for both technical and economic reasons, the Commission must continue to provide full interference protection for operations on licensed spectrum and not allow unlicensed overlays or underlays in licensed bands. Third, there is no valid justification for the Commission to impose any new regulations as suggested by various commenters.

I. Significantly More Licensed Spectrum Should Be Auctioned to Meet the Demand for Mobile Broadband Technologies, Devices, Applications, & Services

In its Opening Comments, Qualcomm urged the Commission to identify, allocate, and auction a considerable amount (hundreds of MHz) of licensed spectrum for mobile broadband to ensure that mobile broadband networks can keep pace with the exponential growth in demand for mobile broadband technologies, devices, applications, and services. Comments of Qualcomm at ii, 27-33. A wide variety of commenters, including carriers of all sizes, vendors, and others, made the same request for more licensed spectrum for mobile broadband. American Legislative Exchange Council at 4; AT&T Comments at 68-69; Cellular South Comments at 4; Clearwire Comments at 10; Comcast Comments at 4-5; CTIA Comments at 68; Ericsson at 14; Google Comments at 4; GSM Assocation at 8-10; Mercatus Center at 1; Metro PCS Comments at iii; Rural Telecommunications Group Comments at 3; Sprint Nextel Comments at ii; Telecommunications Industry Assocation Comments at 3; T-Mobile USA Comments at 3-4, 15-17; US Cellular Comments at 27; Verizon Wireless Comments at 138; Vodafone Group Comments at 6.

As AT&T wrote:

> The nearly 300 million mobile wireless subscribers in the US place enormous value on their wireless services and rely on them for an ever increasing array of new and innovative functions. With the flood of new mobile wireless services on the horizon and the planned upgrades to 4G, the need for more mobile spectrum has never been greater.

Comments of AT&T at 68.

Similarly, Verizon Wireless explained:

> The continued growth of innovative wireless products and services requires the identification of addditional spectrum in the future. [W]hile the AWS-1 and 700 MHz bands will play a crucial role in wireless innovation going forward, the Commission took more than a decade to allocate and auction these bands. Previous efforts to repurpose spectrum managed by the

> [NTIA] from federal to commercial use have taken several years. This lengthy process underscores the importance of identifying potential spectrum bands early so that wireless carriers will have access to sufficient spectrum resources to provide innovative services. Congress, NTIA, and the Commission must act quickly to commence this important process.

Comments of Verizon Wireless at 141.

Finally, Metro PCS wrote:

> Studies show that the demand for wireless data, and the increased bandwidth and speed requirements for some data applications, will result in an exponential growth in traffic and spectrum use. Even with improved technology that dramatically increases capacity within previously allocated bands, the demand for spectrum is projected to far outstrip technological improvements, meaning that identifying and allocating new spectrum must be the Commission's top priority.

Comments of Metro PCS at 6-7.

No one can deny the explosion in mobile broadband demand, and there is no evidence that existing allocations of licensed are sufficient to meet the demand.[1] The Commission's top priority should be identifying, allocating, and auctioning additional licensed spectrum for mobile broadband.

Qualcomm showed in its Opening Comments that the spectrum necessary for wide area wireless coverage must be licensed, not unlicensed, for both technical and economic reasons. Comments of Qualcomm at 36-39. Some commenters did advocate the allocation of additional unlicensed spectrum or the rapid implementation of the unlicensed use of the TV White Space (e.g., Comments of Google at 9-10; Comments of Wireless Internet Service Providers Association ("WISPA") at 5; Comments of Motorola at 11-12; Comments of Spectrum Bridge at 3-4). However, those commenters did not submit any data to justify the need for more

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[1] One commenter claims that the public record is not clear on this point, but cites no actual evidence to support the notion that current spectrum allocations are sufficient. See Comments of Google at 3-4

unlicensed spectrum. The Commission should act on the basis of facts, not speculation. As Qualcomm has shown in prior filings, the evidence shows that that there is no business case for the use of unlicensed spectrum to cover wide areas and that the existing unlicensed allocations are sufficient for local area service. See Charles L. 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. See also Comments of Verizon Wireless at 145.

II. Both for Technical and Economic Reasons, the Commission Should Provide Full Interference Protection for Operations on Licensed Spectrum and Not Allow Unlicensed Overlays or Underlays in Licensed Bands

In its Opening Comments, Qualcomm contended that for mobile broadband to thrive, the Commission should provide full interference protection for operations on licensed spectrum and should not allow unlicensed overlays or underlays in licensed bands. Comments of Qualcomm at 33-36, 39-42. As Sprint Nextel explained:

> Authorizing underlays or overlays in CMRS bands would discourage innovation by operators, raise the costs for the expansion of wireless broadband coverage, and deprive consumers of the higher-speed broadband services that they desire. . . .
>
> Far from encouraging innovation, authorizing underlays or overlays in the CMRS spectrum would create new impediments to achieiving more reliable, higher throughput services because new interference sources would make deployment more technically challenging and more costly. Today's 3G and 4G networks, which are designed to take advantage of low noise floors to provide higher data rates, would automatically respond to higher noise floors by slowing the maximum data rate to consumers. . . .
>
> [E]ven a small increase in noise of 1-2 dB would trigger a 33% reduction in data rates for some users and the areas where the highest data rates could be provided would be substantially reduced in size. Simply put, there is no empirical basis for the proposition that adding overlays or underlays in today's commercial mobile spectrum bands would result in a net gain of competitive services and more intensive use of limited spectrum resources. On the contrary, empirical evidence indicates that exclusive commercial

> spectrum assignments are integral to achieving the high speed, ubiquitous, highly robust wireless broadband services that the Commission is charged with facilitating in its national broadband plan initiative.

Comments of Sprint Nextel at 19-20.

Similarly, as Verizon Wireless explained:

> Any addition of overlays and/or underlays would serve only to decrease spectral efficiency. Indeed, where spectrum rights are non exclusive, "licensees cannot capture the benefits from deploying spectrum-conserving technology," nor will they have the incentive to invest in it, and operators will be forced to respond with costly measures to regain the lost capacity.
>
> Allowing outside users access to exclusively licensed spectrum would expose the licensee to increasingly harmful interference, interference that could cause numerous harms to the licensee's networks. As an initial matter, incumbents would suffer capacity losses in their licensed spectrum.

Comments of Verizon Wireless at 134-135.

Nothing in the record rebuts or even contradicts these fundamental points. One commenter did argue that the Commission should re-open its proceeding on interference temperature, without dealing with the overwhelming evidence in the record of that proceeding which showed that allowing unlicensed overlays or underlays through adoption of an interference temperature metric would impose capacity losses and materially diminish quality of service on the over 270 million Americans who use licensed mobile networks every single day. See Comments of Google at 22 to 24. In truth, there is no basis to suggest that operations on licensed spectrum—which wireless carriers paid billions of dollars at auction to acquire—will continue unaffected if the licensees are forced to tolerate interference from unlicensed devices given access to the very same spectrum for free by regulatory fiat. The Commission should not waste its time resurrecting the overlay/underlay concept that has been thoroughly discredited on both technical and economic grounds.

III. The Commission Should Not Use the License Renewal Process to Reallocate Spectrum, and the Commission Should Not Trample Licensee Rights By Allowing the Uncoordinated Use of Licensed Spectrum for Experimentation

The wireless industry is a critical growth engine for the American economy, and mobile broadband devices, applications, and services are the core drivers of that growth. The Commission should not adopt new regulations or policies which are likely to deter investment or undermine the quality of service that wireless operators provide. Yet, that is exactly what some commenters are urging the Commission to do.

One commenter attacked the highly successful auction program and urged the FCC to use the license renewal process to reallocate auctioned spectrum to new entrants. See Comments of Green Flag Wireless, LLC. There could not be a stronger disincentive to investment than such a policy. Carriers are not going to pay billions of dollars to acquire spectrum at auction and then billions more to deploy and operate networks if the spectrum can be snatched away at renewal time because the Commission wants to favor new entrants. Green Flag Wireless makes the wildly incorrect allegation that there are incumbents who sit on spectrum for a decade without using it. Id. at 5. The truth is, as both the record of this proceeding and the Commission's annual reports on the state of competition in the wireless market show, licensed spectrum is used as quickly as possible, and the Commissions auction program has been a tremendously successful in ensuring that spectrum is awarded to the parties who have the strongest incentive to put the spectrum to its highest and best use as quickly as possible.

Another commenter asked the Commission to allow the experimental use of licensed spectrum without coordination with the affected licensee. See Comments of Boeing at 10-13. This request effectively asks the Commission to trample over the rights of the licensees. The

Commission should not give the holder of an experimental license access to spectrum already licensed to someone else. Over the past two decades, Qualcomm has secured numerous experimental licenses and was required to, and has always been able to, obtain the consent of the affected licensee or licensees prior to conducting its experiments. There is no sound reason for the Commission to change its regulations requiring the holder of an experimental license to coordinate with all affected licensees.

IV. Conclusion

Wherefore, Qualcomm requests that the Commission take actions in accordance with these Reply Comments.

Respectfully submitted,

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