

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

In the Matter of	)	
	)	
Amendment of Part 2 of the Commission's Rules to	)	ET Docket No. 00-258
Allocate Spectrum Below 3GHz for Mobile and	)	
Fixed Services to Support the Introduction of New	)	
Advanced Wireless Systems, including Third	)	
Generation Wireless Systems	)	

**REPLY COMMENTS OF QUALCOMM INCORPORATED**

QUALCOMM Incorporated hereby submits these reply comments in response to the Commission's *Notice of Proposed Rulemaking*, ET Docket No. 00-258 (released January 5, 2001) ("NPRM"). QUALCOMM's reply comments will focus on: a) the ability of operators of cellular and PCS systems to deploy advanced wireless services in their existing spectrum assignments; b) the amount of spectrum necessary for an operator to provide advanced wireless services; c) the need for additional spectrum for IMT-2000 in the longer term; and d) the ability of multi-band, multi-mode phones to accommodate regional and global roaming.

**A. There is adequate spectrum in the cellular and PCS bands to deploy advanced wireless services using IMT-2000 technologies.**

Many of the commenters in the Commission's proceeding have declared that the existing U.S. spectrum allocations are insufficient to support the deployment of advanced services using IMT-2000 technologies. QUALCOMM disagrees, noting that the world's first IMT-2000 systems are being deployed in existing cellular and PCS spectrum assignments. As QUALCOMM, the CDMA Development Group (CDG), Verizon Wireless and Sprint PCS stated in their comments, cellular and PCS operators in Korea, Japan and the United States are currently deploying IMT-2000 systems and will be offering advanced services using existing frequencies.

QUALCOMM recognizes that much of the cellular and PCS frequencies are occupied by systems using first and second-generation technologies. However, by transitioning customers using first and second-generation equipment in these bands to IMT-2000, cellular and PCS operators can more efficiently use their frequency assignments and provide those customers advanced wireless services, such as high-speed data applications. Rather than permit operators to use their existing spectrum inefficiently, the Commission should implement policies that encourage cellular and PCS operators to maximize the use of their existing frequency assignments by using the most efficient technologies available.

**B. Advanced wireless services can be deployed in frequency assignments that are smaller than 2 x 15 MHz.**

Some of the commenters indicated that a minimum of 2x15 MHz is needed per operator

“to facilitate cost-effective product implementation and allow for ubiquitous deployment of “full” 3G services.”<sup>1</sup> QUALCOMM disagrees, noting that operators are able to deploy systems that meet and/or exceed the performance capabilities of IMT-2000 in significantly smaller frequency assignments.

As QUALCOMM and the CDG stated in their comments, an operator deploying the cdma2000 1x mode can provide high quality voice and up to 307 kbps of data throughput in a mobile environment using merely 2.5 MHz (two paired 1.25 MHz bands). This data rate is twice as fast as the ITU requires for IMT-2000 technologies in a fully mobile environment. Moreover, the cdma2000 1xEV mode, which uses a separate channel specifically optimized for packet data services, provides up to 2.4 Mbps in a standard bandwidth 1.25 MHz channel in a fixed, portable or even a mobile environment. This data-only solution *far* surpasses the data service capability foreseen for 3G by the ITU.

By combining cdma2000 1x with cdma2000 1xEV, an operator can deploy both high quality voice and high-speed data services in a minimum of two 2.5 MHz paired bands. Therefore, operators deploying cdma2000 can easily provide advanced wireless services in frequency assignments, such as 2 x 5 MHz or 2 x 10 MHz, which is significantly less spectrum than other commenters have stated is necessary to provide advanced wireless services.<sup>2</sup>

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<sup>1</sup> See “Comments of Nokia, Inc.” and “Comments of Ericsson”.

<sup>2</sup> It is worth noting that certain wireless operators operating in the analog Nordic Mobile Telephone (NMT) bands around the world plan to offer cdma2000 services in allocations of 2 x 4.5 MHz.

**C. Additional spectrum to support the growth of advanced wireless services may be needed in the longer term, but is not necessary in the immediate future.**

While QUALCOMM disagrees with other commenters that currently allocated spectrum is insufficient to support the deployment of full 3G services, it is clear that demand for both wireless and Internet services is continuing to increase rapidly. If this trend continues, QUALCOMM acknowledges that additional spectrum may be needed in the long term to support demand for these services. However, in the near term, so long as efficient technologies are used, currently allocated spectrum should be sufficient to meet demand for both voice and high-speed data applications. The Commission should not rush to make additional spectrum available under the assumption that it is necessary for the deployment of IMT-2000 technologies or to meet near term demand for advanced wireless services.

**D. Domestic, regional and global roaming across new IMT-2000 systems will necessitate multi-mode, multi-band phones**

Many of the commenters have indicated that the harmonization of spectrum on a regional and/or global basis will improve economies of scale, simplify the design and development of equipment, and may facilitate regional and global roaming. QUALCOMM agrees that common frequency allocations may simplify equipment production and roaming.

However, it is important to emphasize that, due to variations in use of technologies and spectrum, regional and global roaming will only be possible through the use of multi-mode, multi-band handsets. As QUALCOMM noted in its comments, multi-band, multi-mode handsets will be

necessary to support national roaming during the deployment of 3G systems. Therefore, multi-band, multi-mode capability will be a standard feature for all initial 3G handsets. Consumers seeking to roam regionally and globally will be able to take advantage of the wide availability of multi-band, multi-mode handsets.

Historically, the development of multi-band, multi-mode equipment has been an expensive and lengthy process. However, as QUALCOMM noted in its previous comments, the new technologies are being introduced that drive down cost and reduce complexity in multi-band, multi-mode handsets. For example, the cost of providing multi-band handset technology is rapidly decreasing with the advent of ZIF (zero intermediate frequency), which simplifies signal processing and the design of multi-band receivers. Tri-mode, dual-band phones are becoming the norm - 31 such CDMA phones have been marketed around the world:

<i>Vendor Name</i>	<i>Tri-Mode, Dual-Band (Cellular/PCS) Handsets on the Market Today</i>
Audiovox	CDM-8000XL; CDM-8000; CDM-9000; CDM-9100; Micro-i
Denso	DENSO 1200
Hyundai	HCT-1000; PE2
Kyocera	Kyocera 6035; QCP 2035; QCP 2027; QCP 2035a; QCP 3035
LGIC	LG-TM210; LG-TM510
Motorola	StarTAC ST7867W; StarTAC ST7868W; StarTAC W7868; Talkabout T2267; Talkabout T8367; Timeport 270; Timeport 270c; Timeport P8367; Timeport P8767

NeoPoint	NeoPoint 2000; NeoPoint 2600
Nokia	Nokia 5170i; Nokia 5185i; Nokia 6185
Samsung	SCH-2500; SPH-T100;

It is clear that next-generation handsets will likewise need to support multiple modes and frequency bands to accommodate roaming. Indeed, most major equipment vendors have announced plans to launch handsets incorporating either GSM, TDMA or CDMA with one or more third-generation standards. Last month, QUALCOMM announced its new family of CDMA Mobile Station Modem (MSM™) integrated circuits and system software - the MSM6xxx family, which will support these multi-mode, multi-band handsets. Various members of the MSM6xxx family will support IMT-2000 standards, including cdma2000, 1xEV and WCDMA modes, as well as offering compatibility with the GSM, GPRS, IS-95 A/B (cdmaOne™) and AMPS standards.

Therefore, while a common global band may provide benefits in terms of simplified equipment production and roaming, improvements in technology as well as 2G/3G market realities are providing solutions in the interim, which may provide relief to administrations seeking to harmonize heavily encumbered frequencies.

**F. Conclusion**

QUALCOMM once again applauds the Commission for its leadership and sound spectrum management policies that permit licensees freedom in determining the services to be offered and

the technologies to be used, while also promoting the most efficient use of assigned frequencies in response to market demands. QUALCOMM encourages the Commission to continue to apply these policies as it makes decisions regarding spectrum for advanced wireless services.

Respectfully submitted,

**QUALCOMM Incorporated**

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Jennifer M. McCarthy  
Director, International Government Affairs  
QUALCOMM Inc.  
2000 K Street, N.W.  
Suite 375  
Washington, D.C. 20006

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