Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services	WT Docket No. 08-27

REPLY COMMENTS OF
3G AMERICAS

3G Americas, the leading industry association representing the GSM family of technologies (GSM, EDGE, HSPA, and LTE) in the Americas, submits these comments in response to the Bureau's request for information in its Public Notice regarding the state of competition in the wireless industry for incorporation into the *Thirteenth Annual CMRS Competition Report.*[1] 3G Americas has a broad membership of leading wireless operators and vendors promoting and facilitating the seamless deployment and widespread adoption throughout the Americas of the GSM evolution to 3G and beyond. 3G Americas' service to its members is largely in providing technical advice and support in standards-setting. As a technical trade association, it is not in a position to provide information based on provider conduct or consumer behavior from direct experience.

[1] Wireless Telecommunications Bureau Seeks Comment on Commercial Mobile Ratio Service Market Competition, Public Notice, WT Docket No. 08-27 (Feb. 25, 2008) ("*Public Notice*").

However, 3G Americas can speak to particular issues with respect to general market structure and market performance.[2]

Mobile Data and Broadband Deployment

With regard to market structure, the Bureau has asked for information on new technological developments and on mobile data and broadband deployment.[3] The Bureau specifically requested information about changes in mobile data and broadband network deployment since the *Twelfth Report* and about newer network technologies, including EDGE and HSDPA.[4]

The GSM family of technologies includes global, open standard technologies that benefit from international input. Accordingly, the evolution of GSM-based technologies benefits from economies of scale and scope, worldwide research and development and international roaming. Since the *Twelfth Report*, GSM deployment has grown approximately 19% in North America. GSM technologies offer consumers a viable, competitive alternative to CDMA: GSM customers utilize a nationwide footprint covering 273 million people in the United States, and most GSM handsets, unlike most CDMA handsets, provide U.S. customers the ability to roam globally in over 200 countries throughout the world.

There are a total of over 50 GSM operators in the United States and most have upgraded to Enhanced Data Rates for Global Evolution ("EDGE") technology. The largest national EDGE coverage footprints in the United States are offered by AT&T

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[2] Public Notice at 2.

[3] *Id.* at 2, 3.

[4] *Id.*at 3.

Mobility and T-Mobile. EDGE provides subscribers with wireless data average throughput speeds of 100-130 Kbps and with nationwide coverage in the United States. EDGE technology theoretically is capable of peak downlink speeds up to 473 Kbps.

The next step beyond EDGE for GSM operators is High Speed *Downlink* Packet Access (HSDPA). Currently, HSDPA is available in over 270 cities throughout the United States. T-Mobile has announced their deployment plans of UMTS/HSDPA equipment on their 1700/2100 Advanced Wireless Spectrum licenses with expected commercial rollout of 3G service commencing in 2008. High Speed *Uplink* Packet Access (HSUPA) is poised to follow HSDPA, with the combination of the two technologies called simply HSPA. Many operators around the world are reporting average user experience performance of HSPA of 600-1400 Kbps on the downlink and 500-800 Kbps on the uplink.

Technology Deployment and Upgrades

To leverage operator investments in HSPA, the Third Generation Partnership Project ("3GPP") has standardized a series of enhancements to create "HSPA Evolution," also referred to as "HSPA+." HSPA Evolution represents a logical development of the Wideband Code Division Multiple Access (WCDMA) approach, and it is the stepping-stone to an entirely new 3GPP radio platform called 3GPP Long Term Evolution (LTE). At CTIA's Wireless 2008 exposition, 3G Americas member Ericsson conducted the world's first end-to-end HSPA Evolution demonstration, with speeds up to 42 Mbps.[5] The demonstration was conducted on a handheld form-factor device. Improved speeds

[5] *See* www.lightreading.com/document.asp?doc_id=149396&site=ctia

up to 42 Mbps allow carriers to leverage existing network infrastructures to meet growing consumer demand for advanced multimedia services. LTE is the next evolution beyond HSPA+ for GSM operators. Most major GSM operators in the Americas are migrating to Third Generation HSPA technology and planning for the next generation of technology, LTE mobile broadband. LTE mobile broadband, which uses Orthogonal Frequency Division Multiple Access (OFDMA), will have trials in 2008.

The Bureau requested information about technological deployments and upgrades,[6] and specifically about the extent to which telecommunications providers have upgraded, or plan to upgrade, their networks to more advanced technologies, including HSDPA, HSUPA, and LTE.[7] The Bureau also requested information about the relative advantages and disadvantages of particular advanced technologies and whether any such differences impacted the competitive marketplace.[8] As mentioned above, 3G Americas is a trade association and is not in a position to provide direct information from an operator's perspective; however, 3G Americas is able to provide general information about technological deployment and upgrades regarding the GSM family of technologies.

In the United States, there is significant EDGE and HSDPA coverage, providing strong competition to CDMA-based technologies such as EV-DO and EV-DO Rev A.[9] Consumers benefit from having access to competing technologies, given the incentive to innovate that such competition brings. Most of the more than 50 GSM operators in the United States have upgraded to EDGE technology. HSDPA is quickly being deployed

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[6] *Public Notice* at 6.

[7] *I*d.

[8] *Id*.

[9] As the Bureau is aware, there is significant difference between CDMA and Wideband CDMA technology (WCDMA)

and will likely cover 350 cities by the end of 2008, including the top 100 most populated cities in the United States. HSDPA, already widely available, follows the successful deployment of UMTS networks around the world and, for many of these networks, is a relatively straightforward upgrade. Any operator deploying UMTS today is doing so with HSDPA.

The GSM family of technologies provides speed and performance that give consumers a competitive alternative to CDMA-based technologies. The capabilities and performance of service improve as an operator deploys EDGE, HSDPA and someday LTE. EDGE provides 100-130 Kbps achievable speeds to customers throughout the nation. The Figures below show the peak data rates possible with advanced GSM-based technologies. Figure 1 shows the peak data rates possible with HSPA, HSPA+, and LTE using different types of Multiple Input and Multiple Output ("MIMO") antenna output and different spectrum bandwidth. Figure 2 shows peak projected HSPA+ and LTE values: peak HSPA+ values are currently projected at 28 Mbps and 42 Mbps, respectively[10] and LTE peak theoretical throughput speeds are expected to be 326 Mbps on the downlink and 86 Mbps on the uplink. As noted above, Ericsson demonstrated HSPA-Evolution up to speeds of 42 Mbps earlier this month, by combining the new higher order modulation technology with advanced antenna technology.[11] Additionally, at CTIA Wireless 2008, April 1st to 3rd in Las Vegas, Nevada, companies such as Alcatel-Lucent, Ericsson, Huawei, Motorola, Nokia-Siemens, Nortel amongst others demonstrated live LTE networks. Recently, AT&T Mobility and Verizon Wireless both

[10] These speeds assume the use of 2X2 MIMO and 16 QAM modulation,Quadrature Amplitude Modulation, which is the modulation technique used in orthogonal frequency division multiplexing.

[11] Ericsson demonstrated HSPA-Evolution with 64QAM and 2X2 MIMO.

committed to LTE technology for use in their 700 MHz licenses as their next wireless technical evolution.

Figure 1: HSPA, HSPA Evolution, and LTE Possible Peak Downlink Data Rates

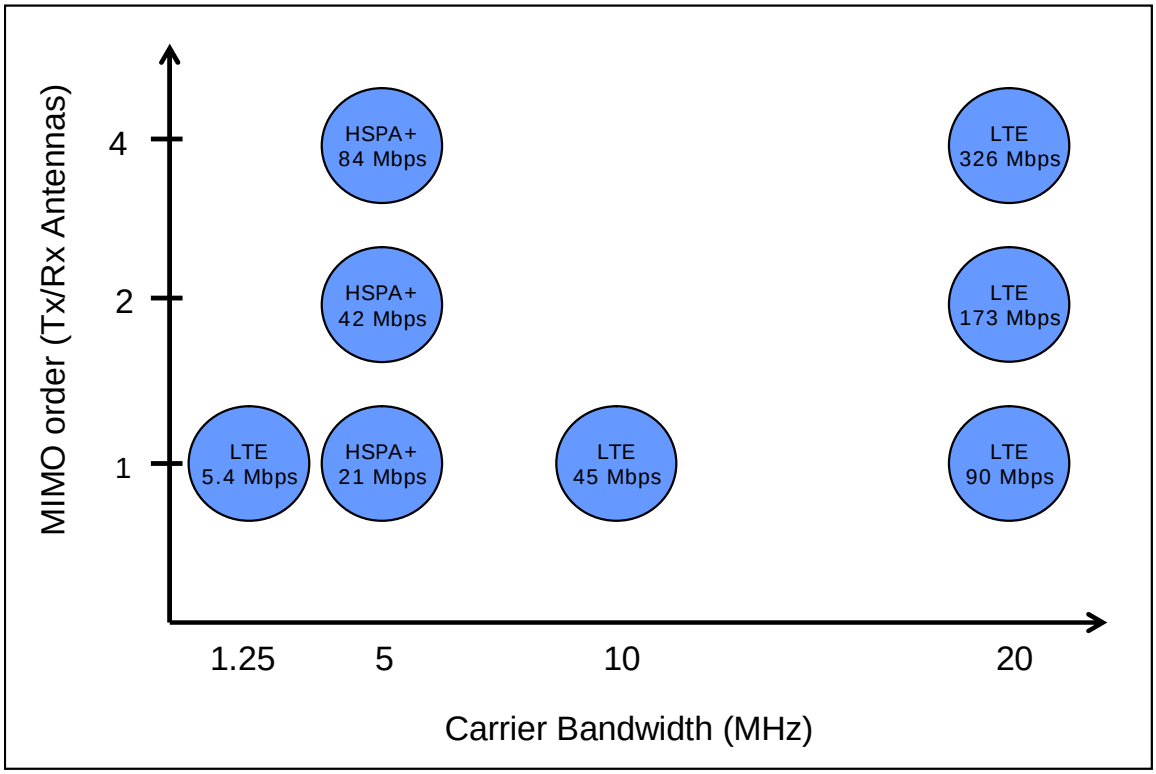

Figure 2: Throughput Performance of Difference Wireless Technologies
(Blue Indicates Theoretical Peak Rates)

	Downlink	Uplink
	Peak Network Speed	**Peak Network Speed**
HSDPA Current Devices	3.6 Mbps	384 kbps
HSDPA Emerging Devices	7.2 Mbps	384 kbps
HSDPA	14.4 Mbps	384 kbps
HSPA	14.4 Mbps	5.76 Mbps
HSPA+ (2X2 MIMO, DL 16 QAM, UL 16 QAM)	28 Mbps	11.5 Mbps
HSPA+ (2X2 MIMO, DL 64 QAM, UL 16 QAM)	42 Mbps	11.5 Mbps
LTE (2X2 MIMO)	173 Mbps	58 Mbps
LTE (4X4 MIMO)	326 Mbps	86 Mbps

Although most GSM operators in the United States are migrating to HSPA, it will still take many years for subscribers to upgrade their devices before most network usage migrates to HSPA. Similarly, even as operators start to deploy OFDM-based LTE networks at the end of this decade and the beginning of the next, it will probably be the middle of the next decade before a large percentage of subscribers are actually using LTE.

Consumers will also benefit from other developments spearheaded by 3GPP, including major core-network architecture enhancements such as the IP Multimedia Subsystem (IMS), which will provide quality of service control and multimedia support, and the Evolved Packet System as well as developments in Fixed-Mobile Convergence. These developments will facilitate new types of services, the integration of legacy and

new networks, the convergence between fixed and wireless systems, and the transition from circuit-switched approaches for voice traffic to a fully packet-switched model. Ultimately, this will provide consumers with the choice of a balanced portfolio of complementary technologies that covers both radio-access and core networks, provides operators with maximum flexibility in how they enhance their networks over time, and supports both voice and data services.

Wireless-Wireline Broadband Competition

With regard to wireless-wireline competition in broadband services, the Bureau has requested comment about the extent to which wireless broadband technologies would be deployed in the BRS/EBS[12] spectrum and about how mobile and portable wireless broadband complement and compete with wireline technologies.[13]

The EDGE/HSPA/LTE family of technologies, and in particular UMTS/HSDPA, offers key technical and business advantages over other mobile wireless technologies. Whereas other wireless technologies show potential on paper, consumers are utilizing HSDPA mobile-broadband service today. The continued use of GSM and EDGE technologies' through ongoing enhancements allows operators to leverage existing investments. With HSDPA, the technology's advantages provide for broadband services that will deliver increased data revenue and provide a path to all-IP architectures. With LTE, the advantages offer a long-term solution that matches or exceeds the performance of competing approaches. All of these different radio-access technologies can coexist

[12] Broadband Radio Services/Educational Broadband Services.

[13] Public Notice at 9-10.

using the same core architecture. Those advantages translate into cost savings for carriers, and an ability to better compete for consumers, to the latter's benefit.

HSDPA offers consumers data rates and performance that are competitive with both broadband and alternative wireless technologies. Today, HSDPA offers the highest peak data rates of any widely available wide-area wireless technology. With continued evolution, peak data rates will continue to increase, spectral efficiency will increase, and latency will decrease. Ultimately, consumers will benefit with support for more users, at higher speeds, with more applications enabled. These greater efficiencies will translate to more competitive offers to consumers and greater network usage by consumers.

Today, HSPA is beginning to compete with wireline broadband services. With HSPA-Evolution, wireless broadband competition to wireline broadband will only increase. LTE also promises to keep wireless-wireline broadband competition vigorous for decades to come. With AT&T Mobility and Verizon Wireless announcing their commitment to LTE, and vendors such as Ericsson, Motorola, Nortel, Alcatel-Lucent, Huawei and Nokia-Siemens demonstrating LTE this month, LTE is developing as technology that will deliver robust wireless broadband on a host of consumer devices.

AWS-1 Auction and Wireless Broadband

The Bureau also requested information about the effect that the AWS-1 Auction will have on the provision of wireless broadband services and broadband competition.[14] With regard to that effect, 3G Americas notes that the AWS auction was an important step toward making more spectrum available for advanced services, including wireless

[14] *Id*. at 10.

broadband. Once carriers are deploying advanced services across the cleared 1710-1755 MHz and 2110-2155 MHz bands, consumers will realize the benefits of additional broadband competition. The auction itself was only one important step. Timely clearing of the spectrum is equally important. 3G Americas commends the Department of Homeland Security for meeting the target of clearing all its stations from the AWS-1 spectrum by March 31, 2008. 3G Americas urges other federal users of the spectrum to likewise clear the band as soon as possible, so the benefits of broadband competition may be enjoyed by consumers this year. While the clearing of the spectrum is still underway, the competitive utility of the spectrum is undermined and will continue to be undermined until the spectrum is fully free for commercial deployments.

3G Americas recognizes that the Commission is not directly engaged in band-clearing activities, but urges that to the extent the Commission engages in spectrum management discussions with the National Telecommunications and Information Administration (NTIA) under its Memorandum of Understanding on spectrum management, that it urge NTIA to encourage other federal users to clear the spectrum as soon as possible, consistent with previously agreed schedules.

Conclusion

GSM is a global, open standards technology with significant leading stakeholders from the United States. There are over 50 GSM operators in the United States that are effectively serving their existing customers and benefitting all consumers by providing robust competition with, and a viable and attractive alternative to, CDMA. Operators are currently upgrading their networks to EDGE and HSDPA technology, which will provide

consumers with even more choices and greater benefits, and will continue to stimulate competition with alternative advanced wireless services. 3G Americas hopes that the information provided in these comments may be of assistance to the Wireless Telecommunications Bureau in preparing its *Thirteenth Annual CMRS Competition Report*.

Respectfully submitted,

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