Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Vuze, Inc.	)	
	)	
Petition to Establish Rules Governing Network Management Practices by Broadband Network Operators	)	WC Docket No. 07-52
	)	
	)	
Free Press, et al., Petition for Declaratory Ruling Regarding Broadband Industry Practices	)	

COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®

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TABLE OF CONTENTS

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I. INTRODUCTION AND SUMMARY

CTIA – The Wireless Association® ("CTIA")[1] hereby submits its comments in response to Public Notices seeking comment on Petitions proposing to define what constitutes "reasonable network management" practices for broadband providers.[2] The Commission should dismiss the Vuze and Free Press Petitions, which seek

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[1] CTIA – The Wireless Association® is the international organization of the wireless communications industry for both wireless carriers and manufacturers. Membership in the organization covers Commercial Mobile Radio Service ("CMRS") providers and manufacturers, including cellular, Advanced Wireless Service, broadband PCS, and ESMR, as well as providers and manufacturers of wireless data services and products.

[2] Vuze, Inc. Petition for Rulemaking to Establish Rules Governing Network Management Practices by Broadband Network Operators, WC Docket No. 07-52 (filed Nov. 14, 2007); Free Press, Public Knowledge, Media Access Project, Consumer Federation of America, Consumers Union, Information Society Project at Yale Law School, Professor Charles Nesson, Co-Director of the Berkman Center for Internet and Society, Harvard law School, Professor Barbara van Schewick, Center for Internet & Society, Stanford Law School, Petition for Declaratory Ruling, CC Docket No. 02-33, 01-337, 95-20, 98-10, GN Docket No. 00-185, CS Docket No. 02-52, WC Docket No. 07-52 (filed Nov. 1, 2007).

one-size-fits-all regulations that would undermine the ability of broadband providers – especially spectrum-based wireless broadband providers – to uniquely manage their networks to deliver high-quality, cutting-edge data and voice services to consumers. The harm that broadband carriers seek to prevent is not harm to some inanimate network, but rather to fellow consumers. Contrary to the way this issue has been portrayed, carriers do not manage networks to the benefit of carriers, but rather to the benefit of consumers.

CTIA takes this opportunity to address the issue of network management practices – particularly with respect to wireless broadband networks. CTIA urges the Commission not to regulate network management in the yet nascent and rapidly evolving mobile wireless broadband market. All broadband providers go to great lengths to provide consumers with the speeds and service levels that facilitate American consumers' use of the Internet. The goal of consumers and providers is the same – a positive broadband experience for the consumers. Specifically, in the wireless context, carriers go to great lengths to manage their limited spectrum-based network resources to optimize all users' mobile wireless experiences – not just the small subset of users whose uses demand very high amounts of bandwidth. Absent network management measures, the cost of accommodating these bandwidth intensive applications will fall squarely on the vast majority of broadband users who do not have such high-bandwidth needs.

Wireless carriers are devoting significant resources to maintain and improve the user experience as next generation mobile voice, data, and video services are deployed. The ability to manage the scarce spectrum resource is particularly important to wireless carriers because voice and data users share the same network capacity. As a result, left unmanaged, wireless data users' bandwidth intensive applications have the potential to

impact other wireless users' voice calls, particularly as carriers move to IP-based networks. CTIA, therefore, urges the Commission to use particular caution when considering any regulation in the area of wireless network management. While CTIA does not address the specific practices of any broadband provider, the Commission should continue to allow carriers to individually manage their networks as they see fit for the continued benefit of consumers. Any attempts, no matter how well informed, by the Commission to regulate what constitutes "reasonable network management" by broadband providers, particularly wireless broadband providers, will at best be rendered obsolete by this rapidly changing environment and at worst will degrade both the basic wireless voice, as well as the broadband user, experience and stifle the innovation that has been the hallmark of this dynamic industry.

II. COMPETITION, NOT REGULATION, BEST ADDRESS CONSUMER DEMANDS IN THE BROADBAND MARKETPLACE

Regulation of the network management practices of broadband providers is unnecessary in the competitive broadband marketplace as competition for customers, not regulation, is the best driver of carrier behavior. American broadband consumers enjoy competition from multiple providers in the broadband marketplace. Both intramodal and intermodal competition, driven by consumer demand, shapes this increasingly important market. In this space, both providers and consumers share the same goal – a positive broadband experience for the consumer.

Most U.S. consumers have their choice of DSL, cable, wireless (fixed and mobile) and satellite broadband providers – and that competition is growing. According to the Commission's statistics on high-speed line availability, as of year-end 2006, 91.5% of all ZIP codes have three of more providers of broadband service – up from 87% just six

months earlier.[3] One in five ZIP codes has ten or more broadband providers.[4] These numbers will grow as wireless carriers across the country continue to roll out their broadband service.

Because consumers have so many choices for broadband service, providers compete through price, quality, mobility and service differentiation for consumers' broadband dollars. Broadband carrier practices are not intended to prevent consumer access to the information and applications of their choice. Rather, they are intended to ensure that with limited capacity *all* consumers enjoy high-quality service. To that end, both wireline and wireless providers continue to upgrade the speeds and capacity of their networks to bring consumers more and faster services,[5] while prices continue to drop.[6]

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[3] *High-Speed Services for Internet Access: Status as of December 31, 2006* at Table 15 *at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/ DOC-277784A1.pdf (Oct. 31, 2007).

[4] *Id.*

[5] *See e.g.*, Press Release, Sprint Nextel Corporation, Sprint Nextel Demonstrates Key Technologies for Mobility Strategy (Aug. 16, 2007) *available at* http://newsreleases.sprint.com/phoenix.zhtml?c=127149&p=irol-newsArticle_newsroom&ID=1041308&highlight=Xohm (last accessed Nov. 30, 2007); *see also* Press Release, Verizon Wireless, Verizon Selects LTE As 4G Wireless Broadband Direction (Nov. 29, 2007) *available at* http://news.vzw.com/news/2007/11/pr2007-11-29.html (last accessed Feb. 13, 2008); John Hodulik, *et al.*, UBS Investment Research, *Is the Broadband Duopoly Under Threat?* 3 (May 10, 2006) ("Wired downstream speeds of 1-3 Mbps two years ago have been upgrade to 3-6 Mbps today. . . . Meanwhile, prices have come down dramatically.").

[6] *See e.g.*, Arik Hesseldahl, *More Bandwidth Than You Can Use?*, BusinessWeek (May 29, 2007), http://www.businessweek.com/technology/content/may2007/tc20070529_569646.htm (last accessed Feb. 13, 2008); *see also* Comments of Verizon and Verizon Wireless, WC Docket No. 07-52, at 4-6 (filed June 15, 2007).

Competition within the market for wireless broadband services is no different. Multiple wireless broadband providers compete with each other to provide consumers better, faster and more ubiquitous mobile wireless broadband offerings. According to the Commission's most recent CMRS Competition Report, 234 million Americans live in census blocks where mobile wireless broadband services are available, and more than 99.5% of the population has access to "Next Gen" wireless service.[7] Subscription to wireless broadband service has seen explosive growth. The most recent FCC report on High-Speed Services for Internet Access shows that from December 2005 to December 2006, the number of wireless broadband users grew over 600%.[8] The report also shows that 62% of all new broadband users in the second half of 2006 chose wireless broadband.[9] In light of this explosive growth and vigorous intermodal and intramodal competition for broadband consumers, the Commission should use particular caution when considering regulation in the area of network management. Because of the high level of competition between broadband providers, carriers have powerful incentives to address the rapidly evolving needs of consumers.

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[7] *In re* 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, *Twelfth Report*, WT Docket No. 7-71, FCC 08-28, Table 11 (Feb. 4, 2008).

[8] *High-Speed Services for Internet Access: Status as of December 31, 2006* at Table 1 *at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/ DOC-277784A1.pdf (Oct. 31, 2007).

[9] *Id.*

III. SPECTRUM-BASED SERVICES ARE PARTICULARLY DEPENDENT ON NETWORK MANAGEMENT

The complaints that the Commission has received about network management practices center on a group of applications that demand large amounts of network resources. These bandwidth intensive applications demand increasingly more data capacity to provide video, share files, and achieve other data-focused purposes. These applications can impact any broadband network. In wireless networks, the impact may be even more acute. In shared networks, like wireless, as these bandwidth intensive applications demand more and more of limited network resources, they do so to the detriment of other network users. Consumers on the whole will be harmed by the exception if carriers are not allowed to manage their network to meet the changing broadband environment.

For example, if an FCC Bureau Chief wants to use a bandwidth intensive application, he or she doesn't simply impact his or her own network connection. Instead, the Chairman and the Commissioners, as well as Bureau and other FCC staff would have their service affected. It is not impact on an inanimate network, but rather on people. This impact on service is further complicated on wireless networks by the fact that spectrum is shared between users and between services, which means that, not only are data users sharing the same amount of network capacity,[10] data users must also share the limited capacity with voice users, particularly as carriers move to IP-based platforms. Without the ability to manage the network environment, use of data intensive

[10] CTIA notes that cable modem data users also share capacity in a similar manner. However, because cable systems have far more capacity than modern wireless systems, the trade-off between capacity and latency and competition for network resources is less acute. As discussed below, simply adding wireless network capacity would not alone obviate the need for network management.

applications will harm consumers. Wireless networks rely on careful management of scarce capacity to ensure that consumers have access to high-quality voice and data service.

First, because of the shared air interface between the consumer device and the base station, wireless broadband customers share the capacity of a cell site with wireless voice users. This is markedly different from the traditional telephone network or cable television. In wireline networks, increased data traffic doesn't have a detrimental effect on wireline voice or cable television services provided over the same physical medium. High DSL traffic doesn't degrade the voice calls on the traditional voice network. An increase in cable modem activity doesn't affect the television signal. While these network operators clearly need to have the ability to manage their networks, on wireless networks the need is even greater. On wireless networks in the absence of network management, bandwidth intensive applications and other spectrum uses would have the potential to prevent or degrade the use of the voice service that consumers rely upon – and in the case of E-911, rely upon in emergency situations.

Because voice and data services share the same connection to the wireless user, wireless carriers must carefully balance consumers' desire for higher capacity data and video service and high-quality voice calling that is free from latency (*i.e.* delays in audio). In order to minimize latency and maximize capacity available to users, the wireless network must determine which packets are less sensitive to immediate delivery. Voice data, which is highly susceptible to the latency of the connection, must be delivered with a higher priority than non-time sensitive data packets that can be better scheduled for more efficient delivery. The Commission has long recognized such "store

and forward" delivery as a key differentiator between basic and enhanced telecommunications services. In wireless networks, the longer packets can be stored for optimal delivery, the greater the overall capacity of the cell will be and the better the chances that the cell will be able to deliver a high throughput speed to the user.[11] Compared to an equal-latency system – where all packets are given equal delivery priority – networks that prioritize packets can be as much as six-times as efficient.[12]

The advanced systems that are currently deployed in wireless carriers' broadband networks – like EV-DO Rev. A or HSPDA – provide an even more illustrative example of how these trade-offs benefit wireless users. These wireless broadband systems give priority to voice traffic, which is sensitive to delay, and use any remaining capacity for data traffic. Put simply, these systems ensure that time-sensitive voice data flows freely to wireless devices while maximizing the data passed in between voice packets based upon the most efficient use of the available spectrum. As a result, a system that is fully loaded with voice traffic will still be able to carry significant data traffic. However, this can be done only if voice traffic is given priority over the data traffic. If data packets and voice packets were transmitted with equal priority, then the capacity of the system would fall to that required by the voice system alone because the system would be unable to accept packets that could not be immediately delivered.[13] A requirement that all packets

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[11] *See e.g.*, E.H. Choi, et al., "Throughput of the 1x EV-DO System with Various Scheduling Algorithms", 2004 IEEE International Symposium on Spread Spectrum Techniques and Applications, Sept. 2, 2004.

[12] *Id.*

[13] Accepting more traffic than used by the voice system alone would increase the delay seen by voice packets to unacceptable levels.

be treated equally would throw away the extra data capacity gained by more efficient wireless broadband technology platforms or sacrifice the quality of today's mobile wireless voice calling.

Second, the capacity of a cell site is shared between all users in that cell. Unlike the example where each user has a dedicated pipe to their home, the wireless user must share the available bandwidth with other users – both voice and data users – in their vicinity.[14] Because of this, a number of factors can contribute to a degraded user experience in the absence of wireless network management. Without the ability to manage network resources, a bandwidth intensive application has the ability to demand the entire capacity of the base station it is connected to. Therefore, if one user's applications are demanding capacity, the applications run by other customers nearby will be competing for the same capacity. This will, at a minimum, slow down the other users' applications, and in the extreme will prevent other users from running their applications or making voice calls.

In order to maximize the utility of the available spectrum to all users, wireless broadband providers utilize network management. For example, modern wireless data networks such as EV-DO and HSDPA use a technique called multi-user diversity to increase capacity of data networks beyond the capacity possible for voice-only networks. By monitoring the quality of the connection between the wireless device and the base station, multi-user diversity allows all of the users of the system to have better capacity. The wireless system monitors the quality of the connection between the base station and

[14] *See* Opposition of CTIA, RM-11361 (filed April 30, 2007), Attachment C (Jackson Paper) at 3.1.1; *see also* Marius Schwartz and Federico Mini, "Hanging up on *Carterfone*: The Economic Case Against Access Regulation in Mobile Wireless," p. 19, May 2, 2007.

the mobile handset and transmits data during intervals when the connection is performing well. If there are several users being served by the same base station, then chances are that at any particular time, one of them has a high-quality connection and transmitting to that user will exploit that high-quality connection for more efficient throughput of data. If the system carefully schedules transmissions to each user, then the system as a whole will perform better than the average connection to each user would allow without scheduling.

Finally, wireless network managers must not only continue to provide increased capacity and services to consumers, they must also contend with the uncertainty of the wireless environment. A number of factors, both natural and man-made, impact the spectral environment. Wireless carriers' ability to react to, and be proactive about mitigating, barriers to wireless service is critical to consumers' quality of service.

Radio transmissions in a shared spectrum environment are susceptible to and may create electromagnetic interference. A non-compliant or less efficient wireless device can negatively impact the user, fellow-users on the same network, and users of competing networks and services in the same or adjacent spectrum bands. Although industry standards and generally applicable regulation – such as the Commission's frequency-specific service rules and equipment certification program – help to partially address interference concerns, they are incomplete solutions in the complex wireless environment.

Carrier-specific network management practices, tailored to their individual networks and the technologies they support, are essential to interference mitigation and maximizing the user experience. The results of independent testing of PCS handsets

conducted in 2004 makes the point.[15] The handsets tested, on average, were able to pick up signals half as strong as the standards mandated. Poor handset performance, both in terms of voice and data service, can result in fewer connections per cell, or the need for increased cells to maintain capacity.[16] This particular issue will become more acute with the recent announcement by some carriers that they will begin to accept any compatible handset for attachment to its network.[17] As a result of less carrier control at the edges of the network, management of the core of the network and connections to the core become increasingly important to maintaining quality of service. Regulatory constraints on carriers' flexibility to manage network resources could undermine these existing, successful practices that ensure that American consumers derive the maximum benefits from finite spectrum resources.

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15 *See* Comments of CTIA – The Wireless Association, ET Docket No. 00-258, at Attachment (filed Dec. 8, 2004).

16 *See id*.

17 *See* Press Release, T-Mobile USA, Industry Leaders Announce Open Platform for Mobile Devices (Nov. 5, 2007) *available at* http://www.t-mobile.com/company/PressReleases_Article.aspx?assetName=Prs_Prs_20071105&title=Industry%20Leaders%20Announce%20Open%20Platform%20for%20Mobile%20Devices (last accessed Nov. 30, 2007); *see also* Press Release, Sprint Nextel Corporation, Sprint Joins Open Handset Alliance (Nov. 5, 2007) *available at* http://newsreleases.sprint.com/phoenix.zhtml?c=127149&p=irol-newsArticle_newsroom&ID=1072575&highlight=handset (last accessed Nov. 30, 2007); Press Release, Open Handset Alliance, Industry Leaders Announce Open Platform for Mobile Devices (Nov. 5, 2007) *available at* http://www.openhandsetalliance.com/press_110507.html (last accessed Nov. 30, 2007); Press Release, Verizon Wireless, Verizon Wireless To Introduce "Any Apps, Any Device" Option For Customers In 2008 (Nov. 27, 2007) *available at* http://news.vzw.com/news/2007/11/pr2007-11-27.html (last accessed Nov. 30, 2007).

IV. NETWORK MANAGEMENT PRACTICES SERVE IMPORTANT QUALITY OF SERVICE GOALS

Despite the claims in the Petitions currently before the Commission, the purpose of network management is to ensure quality of service for consumers – *all* consumers, not just the fraction of users who demand high bandwidth use. A recent Washington Post article highlighting the potential move by Time Warner Cable to a "pay by the bit" data service noted that as few as five percent of users can use more than 50% of the network capacity.[18] This is a statistic that, according to the Yankee Group, is not unique to Time Warner or to wireline services.[19] In the wireless environment, one carrier has determined that less that four-percent of their customers use more than 50% of their network capacity. Vuze and Free Press ask the Commission to regulate broadband providers to accommodate that small portion of users who demand increasingly larger amounts of bandwidth to the detriment of the other users on the network. Neither Vuze nor Free Press, however, shows how the regulation they seek will benefit all consumers.

What is clear is that consumers benefit from broadband providers' network management practices. The simple fact is that in broadband networks, and as all networks move to an "all IP" environment, some packets are more time-sensitive than others. Network managers use different quality of service profiles to accommodate the different characteristics of different services. This type of critical network management is already made today, to the benefit of consumers. Voice service, for example, requires a higher priority because the latency of a voice call is of critical importance. While you

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[18] Steven Levy, "Pay Per Gig", The Washington Post, D1 (Jan. 30, 2008).

[19] David Vorhaus, *Confronting the Albatross of P2P*, Yankee Group (May 31, 2007).

probably won't notice if the packet data letting you know where to find pizza in Poughkeepsie, NY is delayed a few milliseconds before delivery, any delay in a voice call is immediately noticeable. It is this type of distinction that network providers must be able to make in a rational manner to ensure the high quality of service that consumers demand from their broadband –and voice – providers.

In wireline networks, this task may be accomplished by setting aside a portion of the dedicated capacity of the physical medium for delivery of the primary service. However, because wireless users are not assigned dedicated capacity, the shared medium must be managed in such a way that data users' requests can be fulfilled while maintaining critical voice communications.

The ability to manage network resources in this way is particularly critical with respect to the peer-to-peer applications – and other bandwidth intensive applications – which the Petitioners cite. Because these applications can demand incredible amounts of data at a time, they have the potential to overwhelm broadband networks' limited capacity.

Bandwidth intensive applications that refuse to drop a connection to a cell site can be particularly problematic. For example, MAC addresses, or Media Access Control addresses, are individual radio channels assigned to each active user connected to a particular cell site. With some bandwidth intensive applications, once the application acquires a MAC from the site, it never lets go. Because wireless technologies have a limited number of addresses for each cell site, when all of the addresses are assigned, additional users may be unable to establish connections.

Network management is particularly important to wireless providers' ability to meet social obligations to serve the public interest. Wireless carriers' management of traffic, for example, ensures that there is adequate cell capacity to serve an emergency call, or to provide crucial communication to the disability community. Additionally, the ability to control the flow of traffic in wireless networks will continue to be of critical importance as the WARN Act process nears completion and carriers begin offering emergency alerting services to subscribers.[20]

Without network management, in order to accommodate these few high-capacity users and maintain quality of service, network providers would need to build networks with excess capacity across the nation, at a tremendous cost to all consumers (if it is possible at all). Streaming video, for example, consumes as much as ten times the network capacity as other type of communications.[21] But, in the wireless context, the ability to add capacity remains limited by the scarcity of available spectrum resources. Regardless of technology platform, the cost of accommodating these bandwidth intensive applications will fall squarely on the vast majority of broadband users who do not have such high-bandwidth needs.

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[20] WARN Act, Section 603. The WARN Act was enacted on Oct. 11, 2006, as part of the Security Accountability for Every Port Act, Pub. L. No. 109-347, 120 Stat. 1936-1943 (2006).

[21] Marguerite Reardon, *RIM Chief Cautions About Unlimited Wireless Data Plans*, CNET News.com, June 5, 2006 *available at* http://www.news.com/RIM-chief-cautious-about-unlimited-wireless-data-plans/2100-1039_3-6079983.html (last accessed Feb. 13, 2008) ([A]n average voice plan that includes 500 minutes of airtime uses about 45MB of capacity per user per month…. By contrast, a user with an unlimited data plan who watches 15 minutes of video per day, reads at least three articles from a mobile Web site such as CNN.com, and check e-mail using his company's [VPN] uses approximately 1.6GB worth of capacity per month. Translated into voice minutes, this amount of data usage would require roughly 20,000 minutes per month.").

CTIA is not arguing that wireless broadband providers cannot accommodate higher bandwidth applications. Carriers currently provide some of these services. Innovation and change are constant in the wireless industry and the wireless industry has a history of providing new, innovative and faster services, but only when network capacity and technology permits. Broadband Internet access is itself one of those services. As wireless network capacity and speeds have increased – as a result of increased spectrum resources, improved technology, and carrier network management practices – carriers have begun marketing mobile wireless broadband as an alternative to traditional wired Internet access. As wireless technology continues to advance to respond to applications that require more and more network resources, so too will wireless network management policies evolve to meet consumer demand.

In the absence of surplus capacity or new technology, however, U.S. wireless carriers' aggressive management of the available spectrum allows them to do more, with less capacity than U.S. wireline broadband carriers. As a result of the freedom to manage the network for maximum consumer benefit, U.S. wireless carriers are the most efficient users of spectrum around the world. U.S wireless carriers provide service to more than 800,000 subscribers per MHz of spectrum allocated for commercial services – nearly every other country in the world serves fewer than 300,000 subscribers per MHz.[22]

Bandwidth intensive applications distribute content at the expense of not only spectrum efficiency, but system efficiency – and in the extreme, at the expense of voice

[22] *See* CTIA Written Ex Parte Communication, WT Docket Nos. 07-71 and 05-194 (dated Jan. 8, 2008), *available at* http://files.ctia.org/pdf/filings/080108_US-OECD_10_Comparison_Ex_Parte.pdf.

capacity.[23] In order to compete in the broadband marketplace, wireless carriers must ensure that quality service and capacity is provided to *all* of its customers, not the few who wish to utilize an entire cell site's bandwidth to run their chosen application. Dynamic network resource management ensures this goal and the continued growth and availability of wireless broadband.

V. BECAUSE BROADBAND NETWORKS ARE NOT UNIFORM, MANAGEMENT OF THEM SHOULD NOT BE EITHER

One-size-fits-all solutions to network management are problematic in broadband networks because of the technological, capacity and business differences between carriers and markets that permeate the industry. The technologically diverse broadband marketplace necessitates differing approaches to network management. While CTIA does not address the specific practices of any broadband provider, the Commission should continue to allow carriers to individually manage their networks as they see fit for the continued benefit of consumers.

What may be a good guideline for network management on one technological platform may be completely inappropriate for another competing technology. Within the mobile wireless broadband marketplace alone, there are at least three different technologies at work, with many more in the process of being implemented. As a result of this technological evolution and diversity, carriers employing differing technologies face different challenges and employ different methods to meet consumers' demands. Within one wireless carrier, for example, the spectrum available to provide services

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[23] "A few Slingboxes, used to tab into one's home television programming over the Internet when away from home, could 'take down' local service if connected to a wireless network." Telecommunications Reports, *Telcos Target TV Options Amid Rapidly Evolving Video Delivery Landscape*, Jan. 15, 2007.

varies from market to market based on the carrier's licenses. For example, a wireless carrier with 40 MHz of spectrum in one market may have considerably less spectrum available to it in other markets. Additionally, some spectrum bands and blocks are better suited to certain uses. Because the network configuration and RF challenges are unique to each carrier, the Commission should continue to allow each carrier to uniquely manage their scarce network resources to best serve consumers.

The Commission's well-reasoned decision to allow wireless licensees to deploy the technological solutions of their choice has resulted in the vibrant and dynamic marketplace that consumers enjoy today. As described above, consumers benefit from the competition between and among broadband platforms. The Commission should avoid blanket statements as to what is and what is not reasonable network management and continue permitting broadband providers to tailor their networks and network management practices to meet technological innovation and consumer demands.

VI. CONCLUSION

Broadband providers face unique challenges in continuing to bring consumers the high quality, high-speed, innovative services they demand. The goal of all broadband providers is to give the consumer a positive broadband experience. Network management efforts are pursued not to benefit an inanimate network, but rather to benefit broadband consumers. In this competitive market, consumer demand drives the incredible rate of innovation and change that typifies the industry.

Wireless providers face particularly high hurdles to providing broadband service because of the shared and scarce nature of spectrum and the challenge of providing time-sensitive voice communications over the same interface as high-speed data. Absent

network management measures, the cost of accommodating bandwidth intensive applications will fall squarely on the vast majority of broadband users who do not have such high-bandwidth needs. In this industry, carriers need to retain the ability to manage their networks to provide consumers not only with a positive broadband experience, but also with the security of an "always with you" mobile voice network.

Any regulation of this dynamic industry will quickly be surpassed by the technological and service innovations that continue to shape the industry. The Commission should dismiss the pending Petitions and continue to allow broadband carriers to manage their unique networks for the benefit of their customers.

Respectfully submitted,

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