Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
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Wireless Telecommunications Bureau Seeks Comment on the State of Mobile Wireless Competition	)	WT Docket No. 11-186
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COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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TABLE OF CONTENTS

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I. INTRODUCTION AND SUMMARY

The Telecommunications Industry Association (TIA) hereby submits comments to the Federal Communications Commission (Commission) in the above-captioned proceeding.[1] TIA, on behalf of its member companies, applauds the Commission for continuing its efforts to assess and facilitate the competitive wireless service, device, and applications industry. In evaluating the competitive state of these industries, past successful pro-market policies the Commission has adopted, and the need for continued market-based, deliberative regulation, the Commission has a unique opportunity to further expand competition in the wireless industry across all demographics and regions. The Telecommunications Industry Association (TIA) represents the global information and communications technology (ICT) industry through standards development, advocacy, tradeshows, business opportunities, market intelligence and world-wide environmental regulatory analysis.

[1] *Wireless Telecommunications Bureau Seeks Comment on the State of Mobile Wireless Competition*, WT Docket No. 11-186, *Notice of Inquiry*, FCC 11-1856 (rel. November 3, 2011, 2009) ("Wireless Competition NOI").

Its 500 member companies manufacture or supply the products and services used in the provision of broadband and broadband-enabled applications. With roots dating back to 1924, TIA enhances the business environment for broadband, mobile wireless, information technology, networks, cable, satellite and unified communications. Members' products and services empower communications in every industry and market, including healthcare, education, security, public safety, transportation, government, the military, the environment and entertainment.

As detailed below, the mobile wireless marketplace is both highly competitive and a center of significant technological innovation. The Commission can continue to encourage this thriving ecosystem by adopting policies that encourage investment in intelligent network infrastructure, foster competition in the broadband industry, promote consumer access to information and connectivity of devices, and allow the market, instead of government, to choose winners and losers. TIA encourages the Commission to ensure that a well-adjusted approach to broadband policy must combine appropriate government action with the power of the free market. Market participants are reluctant to invest in new or upgraded infrastructure when their return on their investment is uncertain. In the face of such uncertainty, investors are likely to take their capital to other sectors offering better opportunities for gain. TIA thus urges the Commission to resist the impulse to impose detailed prescriptive regulation on the ways in which competing platform providers operate their next-generation networks.

TIA has detailed in various Commission dockets the ways in which the Commission could promote the mobile wireless marketplace by adopting policies that promote private investment

and make the best use of public resources. For the reasons set forth below, TIA urges the Commission to regard mobile wireless competition as robust, and to consider and endorse the pro-competitive nature of wireless handset exclusivity agreements, its existing spectrum screen policies, and policies that promote adoption of wireless broadband.

II. TIA ESTIMATES THAT DATA SERVICES ARE DRIVING SIGNIFICANT GROWTH IN THE MOBILE WIRELESS MARKETPLACE

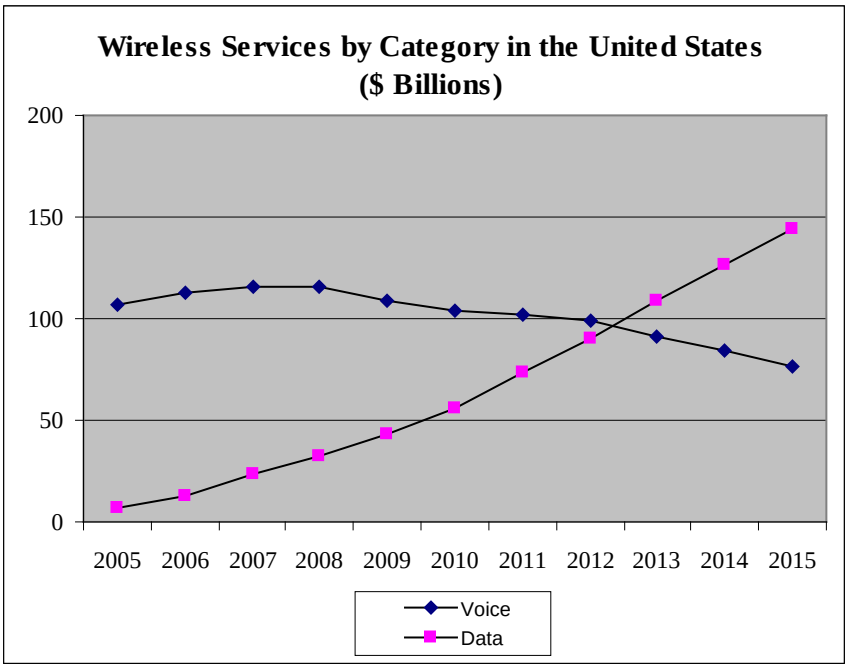
The Commission has requested information regarding the importance of the mobile data and mobile broadband services.[2] TIA estimates that U.S. wireless market spending in 2011 rose 11.8 percent, the largest increase since 2006 and the first double-digit advance since 2007. The market consists of voice and data services including CDMA2000, UMTS, and machine-to-machine services, wireless terminals and infrastructure equipment, Wi-Fi® and worldwide interoperability for microwave access (WiMAX™) equipment, long-term evolution (LTE) equipment, and professional services in support of the wireless infrastructure. The market in 2011 benefited from faster growth in wireless subscribers, a jump in spending on data services, and double-digit gains in equipment and wireless handsets. The handset market was fueled by growth in smartphones while the equipment market was buoyed by wireless network upgrades and spending on LTE equipment. Wireless equipment spending rose 23.9 percent in 2011, spending on wireless devices increased 15.4 percent while transport services grew 10.0 percent.

[2] Wireless Competition NOI at ¶ 1-2, 5-7

The pickup in 2011 reflects the transformation of the market from primarily a voice service to principally a data service. Growth in the services, handset and equipment markets is being driven by the demand for data. Smartphones are replacing feature phones and carriers are rolling out LTE networks to accommodate the surging demand for data. Smartphone users download from 10 to 50 times as much data as feature phone users, creating capacity constraints for wireless networks.[3] Although data consumption is by no means fully monetized — smartphone users spend only about five times as much for data as feature phone users — TIA expects total spending on data services to overtake the voice services market in 2013. By 2015, data services will be 89 percent larger than voice services (see Figure 1 below).

[3] According to recent data, an active smartphone user generates more than 1 MB traffic per day. Even with the increased deployment and utilization of LTE networks, global mobile network operator data delivery costs could surpass $370 billion annually by 2016, a 7 times increase on their 2010 level of $53 billion. *See* Press Release, Juniper Research, *Press Release: Mobile Network Operators Face Seven Fold Increase in Data Delivery Costs, Rising to $370bn by 2016, Juniper Research warns*, Aug. 2, 2011, *available at* http://www.juniperresearch.com/viewpressrelease.php?pr=254.

Figure 1: Wireless Service by Category[4]



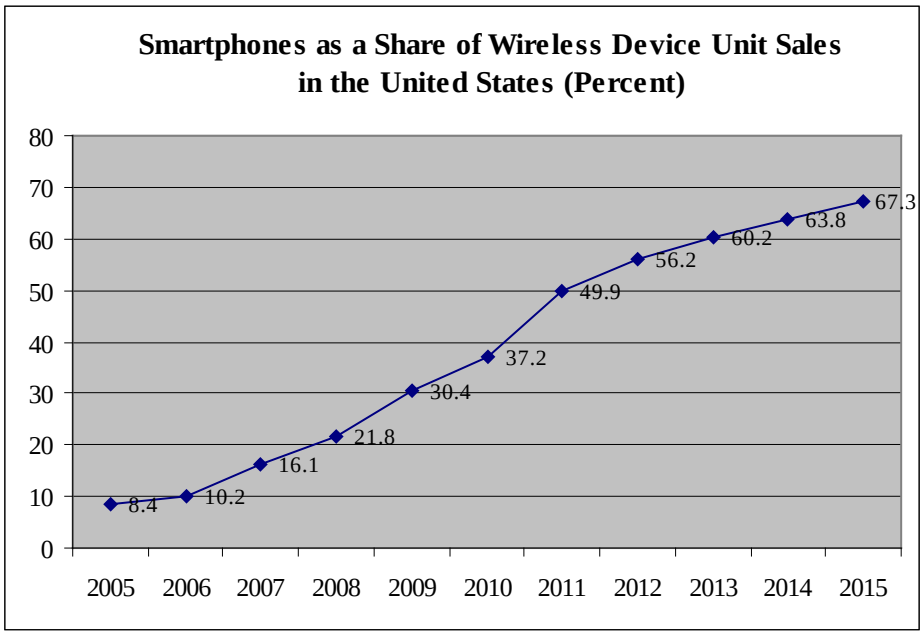
Voice services began declining in 2009 despite ongoing growth in the wireless universe as competition for basic services drove down average spending. TIA expects the voice market to decline to $76.1 billion in 2015 from $102.3 billion in 2011, a 7.1 percent compound annual decrease. The data market, by contrast, has grown at double-digit rates and will continue to do so, rising 18.3 percent compounded annually from $73.6 billion in 2011 to $144.2 billion in 2015.

Smartphone and tablet users are the principal spenders on wireless data, generating $54.3 billion in 2011, or 74 percent of total spending on data services. North American market smartphone

[4] This data, as well as all other projections and statistics provided in this document which are not cited to otherwise, are derived from the TIA *2011 ICT Market Review & Forecast*, a proprietary annual publication from TIA containing distilled data and analysis on information and communications technology industry trends and market forecasts through the end of 2014. This document is available for purchase at http://www.tiaonline.org/market_intelligence/mrf/.

penetration is the highest in the world, recently pegged at 63 percent.[5] Nearly half of all wireless phones sold in 2011 were smartphones, a share that is expected to increase to nearly two-thirds by 2015 (see Figure 2 below).

Figure 2: Smartphones as a Share of Wireless Device Sales



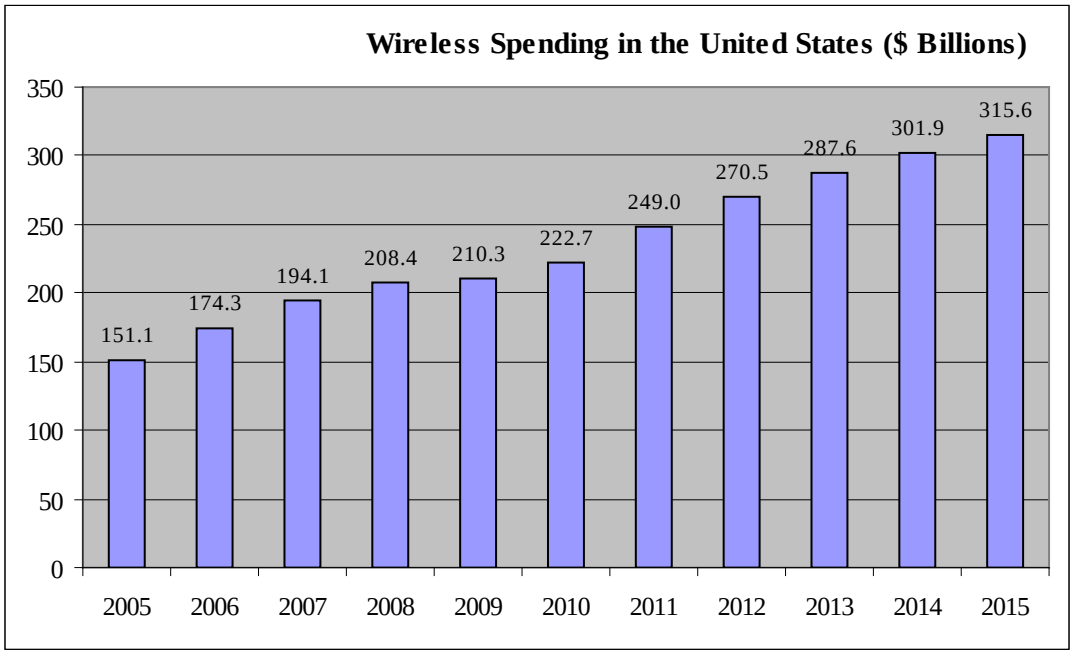
The decline in data spending by feature phone users principally reflects the decline in the feature phone installed base as wireless users transition to smartphones. TIA expects data spending by feature phone users to decline to only $5 billion in 2015 from $16.2 billion in 2011.

TIA projects the overall wireless market, including voice and data services, wireless terminal and infrastructure equipment, and services in support of the wireless infrastructure, to expand at a 6.1 percent compound annual rate, reaching an estimated $316 billion in 2015 from $249 billion in

[5] *See* VisionMobile, *Mobile Platforms: The Clash of Ecosystems* (rel. Nov. 2011) at 7, *available at* http://www.visionmobile.com/rsc/researchreports/VisionMobile-Clash-of-Ecosystems_v1.pdf.

2011 (see Figure 3 below). Wireless equipment will be the fastest growing category at 11.5 percent compounded annually. Transport services will each grow at projected 5.8 percent rate compounded annually, support services will increase 6.8 percent on a compound annual basis, while the wireless device market will be the slowest-growing category at 2.4 percent compounded annually.

Figure 3: Wireless Spending in the United States



III. WIRELESS INVESTMENT, ESPECIALLY FOR DATA, DRIVES TELECOMMUNICATION INVESTMENT

The Commission has also requested detail about industry investment in the mobile wireless industry, including infrastructure.[6] Wireless data is driving telecommunications investment. Wireless carriers are upgrading their infrastructures to increase capacity and to launch LTE services to take advantage of the more lucrative data market. Spending rose 24.8 percent in 2011 and TIA looks for continued double-digit increases during the next two years. Thus, despite the fact that the basic voice wireless infrastructure is already built out, there continues to be significant equipment and infrastructure spending. Upgrades to 3G led to an increase in the number of cell sites during the middle of the previous decade. During the past three years, cell site growth slowed, but TIA expects a pickup in new cell sites beginning in 2012 as LTE rollouts gain momentum and as integrated terrestrial/satellite wholesale LTE services are introduced. TIA projects the overall number of cell sites to grow 31.5 percent during the next four years to 340,000 in 2015 from 258,500 in 2011, a 7.1 percent increase on a compound annual basis.

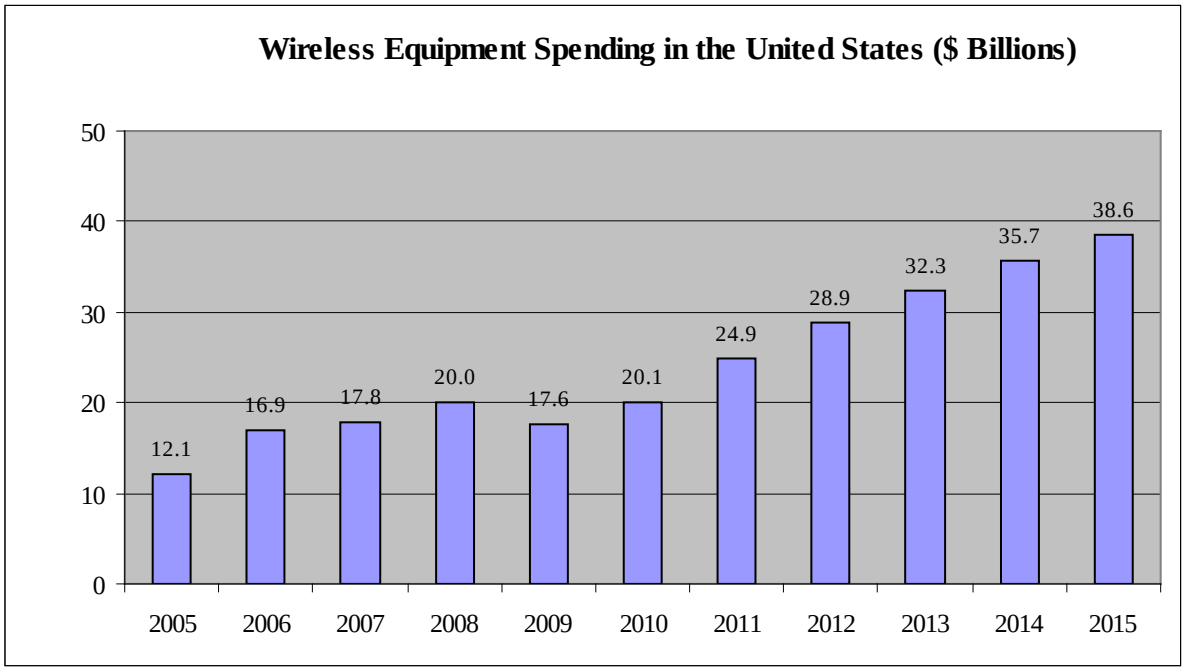
New cell sites and upgrades in network capacity will boost spending on basic wireless infrastructure equipment by a projected 12.1 percent compounded annually to $27 billion in 2015 from $17.1 billion in 2011. Cumulative spending on wireless infrastructure will total $95.5 billion over that period.

[6] Wireless Competition NOI at ¶ 11, 14

Ratification of the 802.11n standard[7] in 2009 and improvements in wireless LAN security, have spurred growth of WLANs in the enterprise market. Spending on Wi-Fi equipment associated with WLANs rose 5.9 percent in 2011, but we expect a faster 8.3 percent increase in 2012 as cable companies enter the market with new rollouts. We then look for somewhat slower growth as the WLAN equipment infrastructure is largely in place. TIA projects Wi-Fi equipment spending to grow 5.7 percent compounded annually to $2.3 billion in 2015 from $1.8 billion in 2011.

Overall wireless equipment and infrastructure spending will total $38.6 billion in 2015 from $24.9 billion in 2011, increasing at an 11.5 percent compound annual rate (See Figure 4 below).

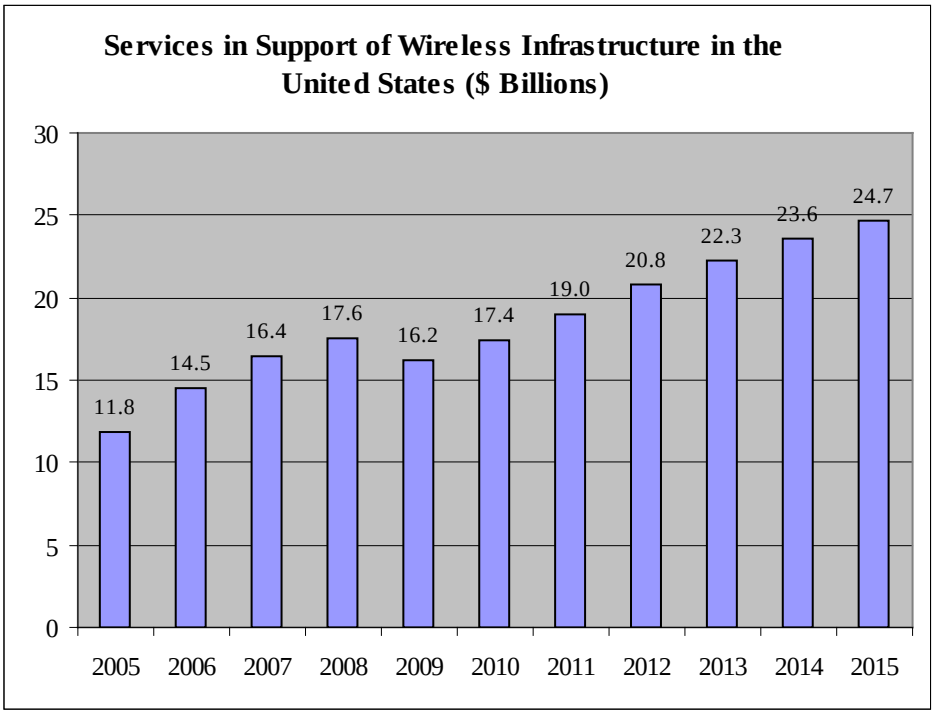
Figure 4: Wireless Equipment Spending in the United States ($ Billions)



[7] *See* http://standards.ieee.org/getieee802/download/802.11n-2009.pdf.

Spending on services in support of the wireless infrastructure (including Global System for Mobile Communications [GSM], code division multiple access [CDMA], HSPA+, the newest UMTS release, Wi-Fi, and WiMAX infrastructures), rose 9.2 percent in 2011, reflecting faster growth in equipment spending. Support services include basic services and support (e.g., field maintenance and repair), professional services, and depot repair and logistics. TIA expects a larger 9.5 percent rise in 2012 followed by more moderate gains in subsequent years as growth in the overall equipment market moderates. Spending will increase to a projected $24.7 billion by 2015, up 6.8 percent on a compound annual basis from the $19 billion total of 2011 (see Figure 5 below).

Figure 5: Services in Support of Wireless Infrastructure in the United States ($ Billions)



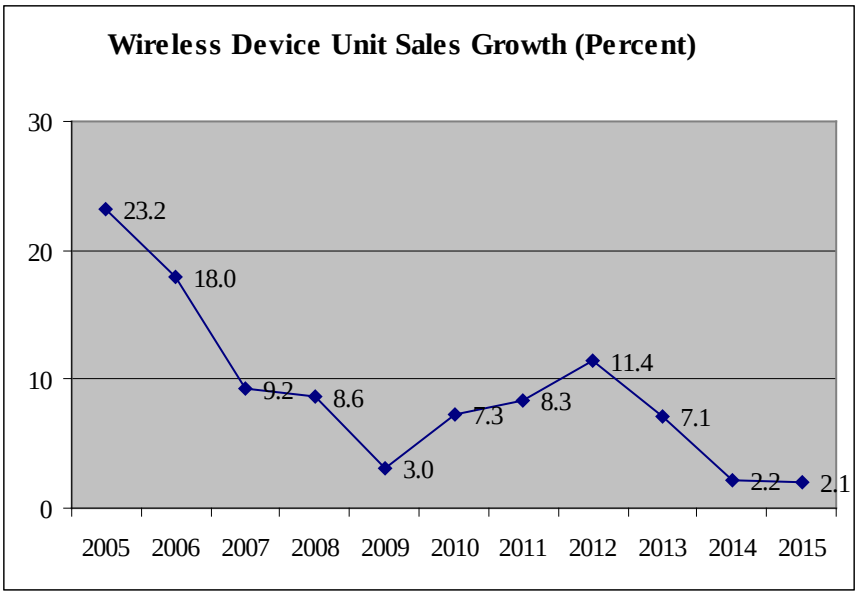
IV. THE WIRELESS DEVICE MARKET IS HIGHLY COMPETITIVE

The Commission has requested information on mobile wireless devices.[8] The growing demand to replace feature phones with smartphones is fueling wireless device sales and offsetting the adverse impact of slower growth in wireless subscribers. We project wireless device unit sales to increase a cumulative 19.3 percent during the next two years. Then, as the market becomes dominated by smartphones, further upgrades will play less of a role and we look for unit sales growth to drop to an average of 2.2 percent in 2014–15.[9] For the forecast period as a whole, we expect handset unit sales to increase at a 5.6 percent compound annual rate, outpacing the projected 2.4 percent compound annual increase in subscribers (see Figure 6 below).

[8] Wireless Competition NOI at ¶ 14-15

[9] As noted above, North American market smartphone penetration is the highest in the world, recently determined to be 63 percent. *Infra. at* 6.

Figure 6: Wireless Device Unit Sales Growth

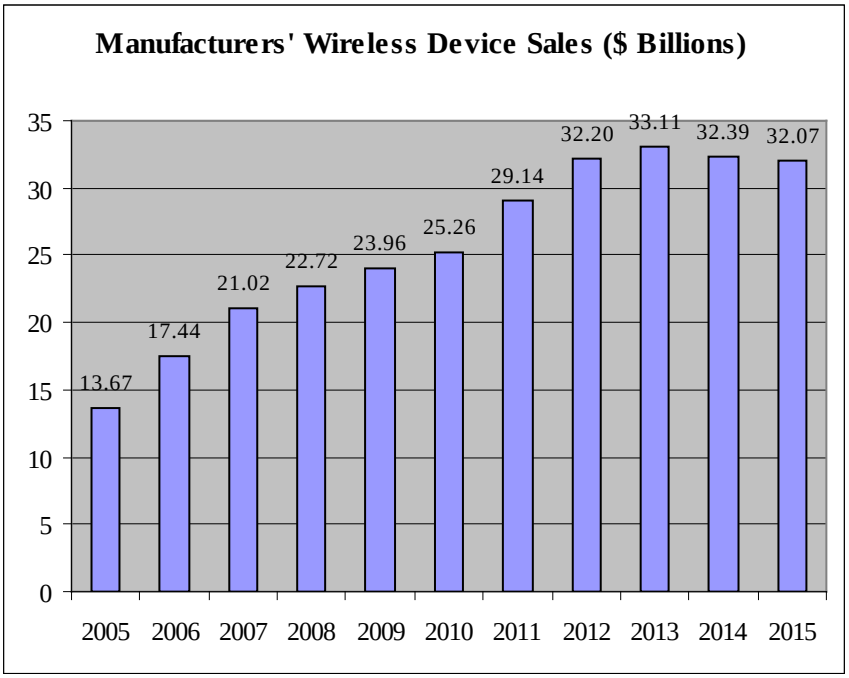


Average prices of both smartphones and feature phones are coming down but the growing share of the more expensive smartphones in overall unit sales in 2011 led to a 6.3 percent increase in average spending per device. We expect the overall average price to resume its downward trend in 2012 as price cuts offset the impact of growing smartphone penetration. By 2013, as smartphones comprise well more than 60 percent of handset sales, the incremental shift from feature phones to smartphones will play less of a role, and smartphone price declines will become a more prominent driver. Consequently, we look for steeper declines in the average handset prices during 2013–15. According to estimates, the average selling prices for smartphones have declined for four consecutive quarters, reaching $135 in Q3 of 2011.[10]

[10] *See* NPD Group, NPD Mobile Phone Track Service (Nov. 14, 2011), *available at* https://www.npd.com/wps/portal/npd/us/news/pressreleases/pr_111114a.

Spending on wireless handsets rose 15.4 percent in 2011, the result of an 8.3 percent increase in unit sales and a 6.3 percent increase in the average price. TIA projects another double-digit gain in 2012 followed by a modest 2.9 percent increase in 2013. We then expect declining prices to offset growth in unit sales and project spending on handsets to fall in 2014–15. For the forecast period as a whole, manufacturer handset sales will grow by 2.4 percent on a compound annual basis to $32.1 billion in 2015 from $29.1 billion in 2011.

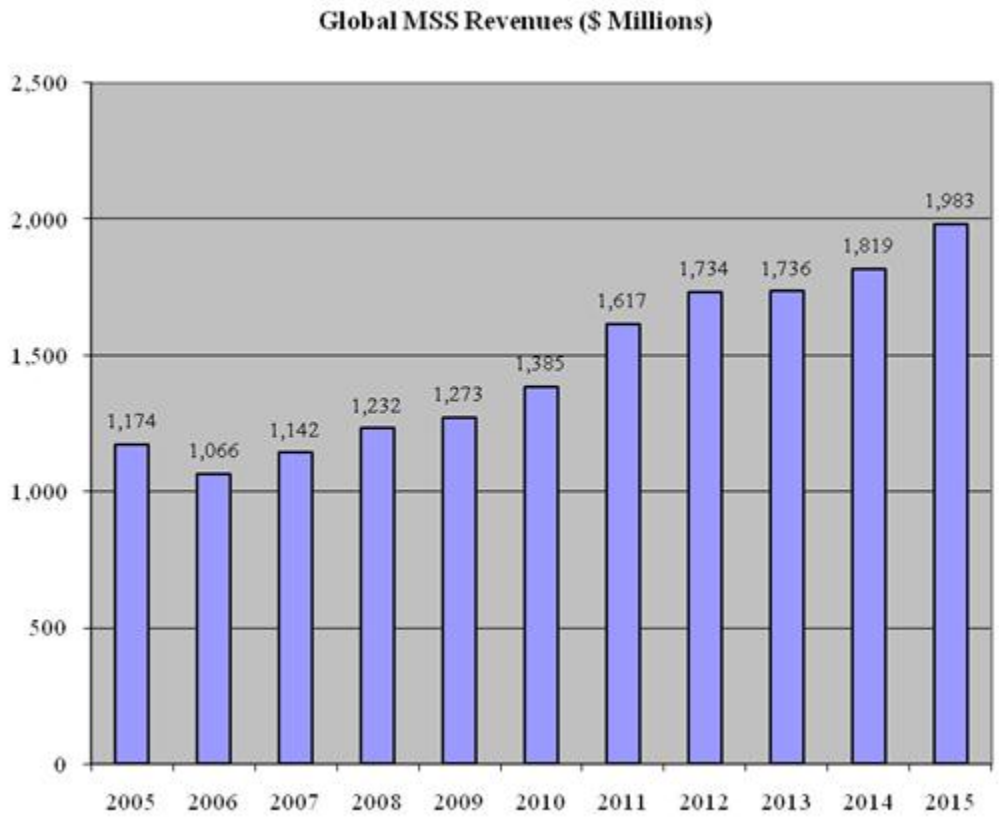
Figure 7: Manufacturers Wireless Device Sales ($ Billions)



In the Mobile Satellite Spectrum (MSS) market, spending grew 16.8 percent in 2011 to $1.6 billion as new services came online. As the price of satellite services continues to decline, TIA expects the increases to be more moderate in future years growing by 5.2 percent on a compound annual rate through 2015 reaching $2.0 billion. The number of terminals is expected to grow

17.2 percent compounded annually to 5.1 million terminals in 2015 as the number of terminals used to monitor remote asserts continues to climb (see below).

Figure 8: Global MSS Revenues



V. WIRELESS LANS ARE AN IMPORTANT ENABLER OF MOBILE COMMUNICATIONS

The Commission has additionally sought information about intermodal services, including Wireless Local Area Networks (WLANs).[11] WLANs enable users to transmit data over short distances without a cable connection. Since wireless connections, by nature, do not require costly wiring, they are much easier and cheaper to implement. A wireless network can be used to supplement a wired network when additions or changes need to be made. The publication of the first Institute of Electrical and Electronics Engineers (IEEE) 802.11 standard in 1997 spurred the growth of WLANs by allowing economies of scale and lower equipment costs. Although WLAN technology had been in place for a number of years, its deployment was stymied by a lack of an accepted standard. More advanced standards, lower prices, and improved security have all been factors contributing to the growth of the WLAN market. The inclusion of Wi-Fi technology in most new laptops and many new phones is helping to drive the industry.

Wi-Fi technology has three distinct market segments: home, business and public. The home segment enables an Internet connection to be shared among computers in different rooms without the need for complicated wiring and allows multimedia files to be transferred effortlessly between computers. The home market represents the bulk of the WLAN industry. The business segment allows communications where wired communications are not practical and provides greater efficiency through mobility of employees. The public segment allows users to access the Internet at broadband speeds at public hot spots.

[11] Wireless Competition NOI at ¶ 15,16

A. HOME WLAN MARKET

The number of Wi-Fi enabled phones has been growing dramatically as the carriers have become more comfortable with Wi-Fi and its ability to offload network capacity and to improve the consumer experience. Consumers are beginning to expect the service because of its higher data rate and better indoor reception. There are hundreds of phones that have been certified by the Wi-Fi Alliance giving consumers many choices. Originally, the Wi-Fi feature was found predominantly in smartphones to access the Internet. However, more recently a growing number of feature phones are featuring Wi-Fi and are being used to stream photos, music, and video from phones to PCs. Many carriers require that all of its smartphones contain Wi-Fi capabilities. However, until 2010, all of the phones used earlier Wi-Fi standards. As of March 2010, there were only ten 802.11n certified phones, including six from Samsung and four from LG. By the end of the year, the picture changed with many phones supporting the new standard. By the end of 2012, TIA expects the majority of Wi-Fi enabled phones will conform to the 802.11n standard. At the same time, a new feature called Wi-Fi Direct, also known as ad-hoc networking, is being introduced that allows phones to transmit files and stream media directly to printers and other devices without a router. The major drivers of the 802.11n standard are the bandwidth intensive applications like streaming videos and playing games with a lot of graphics. The advantages of 802.11n include a download speed five times faster than 802.11g and a doubling of the hot spot range. Additionally, due to the higher efficiency, battery time is extended.

The number of Wi-Fi enabled devices in the home is expected to increase dramatically over the next few years as demand for devices like digital frames, e-readers, game devices, and digital televisions continues to expand. The number of home WLANs has increased significantly with the increased penetration of broadband connections using DSL and cable modems. WLANs are being used by consumers to share a broadband connection among multiple devices. Only one modem is required, and computers can be added to the network simply by plugging in a wireless card. Files and printers can thus be accessed from anywhere in the home, and the transferring of files between computers no longer requires burning a CD and walking it over to the other computer. Wireless networks are designed to eliminate the obstacles and the costs created by having to run cables between the various devices, making them easier and less expensive to establish than wired home networks.

Traditionally, home networks included a gateway or modem that connected many devices to a central point and then managed the connection to the Internet. There was very little in the way of peer-to-peer connections. That is changing with standards such as Wi-Fi Direct that was launched in October 2010 allowing devices to interact with each other directly without having to go through an Internet connection.

The introduction of cloud services has expanded the amount of content available to home networks. In the past, a home network had the content reside in one device and then transferred among devices through the WLAN. With the advent of cloud services, the content no longer needs to be in the home but could be in the cloud with devices in the home accessing the content and then sharing them with other devices in the home. According to estimates, global cloud

computing traffic will grow 12-fold from 130 exabytes to reach a total of 1.6 zettabytes annually (one zettabyte is equal to a trillion gigabytes) by 2015, a 66 percent compound annual growth rate.[12]

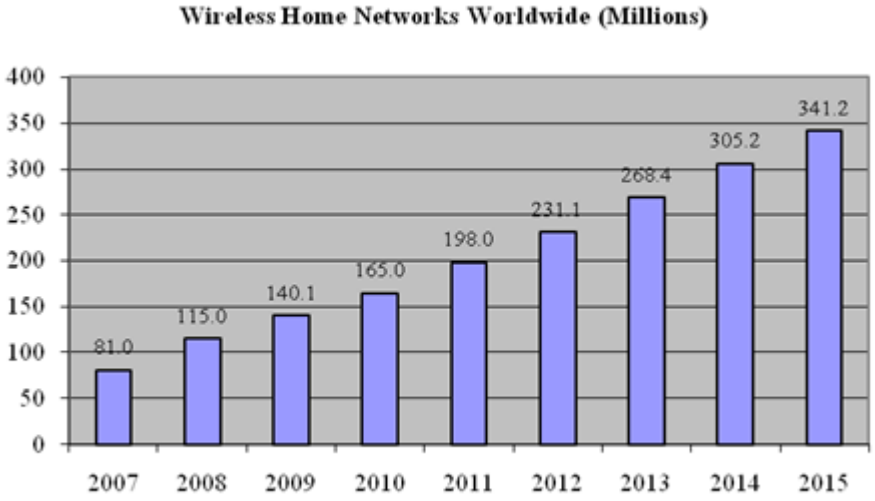
WLANs may soon be extending beyond the home to America's cars. In October, BMW announced the development of a technology called Car-to-x communication that enables cars to communicate with each other and their environment.[13] The system will let drivers know what lies ahead of them and lets them know when lights will change. The communication system relies on WLANs to alert drivers of potential dangers ahead or of traffic congestion. A car that passes a dangerous situation will automatically alert other cars in the area.

In 2011, there were 198 million wireless home networks worldwide, 20 percent more than the 165 million of 2010. Most laptop computers now include the newest 802.11n equipment. Additionally, many service providers are offering free wireless routers with new broadband subscriptions, which will help spur the growth of WLANs in the home. Lastly, the migration to energy efficient smart homes is driving the growth of WLANs. As a result, the number of wireless home networks is expected to increase 14.6 percent on a compound annual basis through 2015, reaching 341.2 million (see Figure 8 below).

[12] *See* Cisco, *Cisco Global Cloud Index: Forecast and Methodology, 2010–2015* (rel. Nov. 29, 2011) at 4, *available at* http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns1175/Cloud_Index_White_Paper.pdf.

[13] *See, e.g.*, Press Release, *BMW: When cars talk to each other*, *available at* https://www.press.bmwgroup.com/pressclub/p/pcgl/pressDetail.html?outputChannelId=6&id=T0122846EN&left_menu_item=node__2374

Figure 9: Wireless Home Networks Worldwide



B. BUSINESS WLAN MARKET

WLANs reduce the amount of cable needed for communications and they provide network communications where cabling is not practical, such as in certain warehouse situations. Security issues represent the greatest factor inhibiting the widespread use of WLANs in the enterprise. With improved encryption techniques, such as virtual private networks (VPNs) and IP Security Protocol (IPSec) reducing the risk of security problems, more enterprises are installing WLANs.

Enterprises initially used WLANs to provide Internet access for visitors and often located access points in reception areas and conference rooms. The companies then realized the efficiencies of WLANs, such as the ability to move people easily around corporate environments without

having to rewire with every move. Additionally, employees can stay connected as they move from meeting to meeting.

WLANs have grown relatively more slowly in the enterprise than in households because they are very expensive compared to household WLANs, although they do provide more functionality. Since relatively few have been deployed, the prices for enterprise-quality WLANs have not dropped as quickly as for equipment used at home.

Security continues to be a major concern for the enterprise market. Security in a wireless network depends on encrypting traffic across the network and controlling the wireless access points (WAPs). With the explosive growth of smartphones, most employees are bringing their own devices to work and expect access to corporate WLANs. Companies must develop methods to identify users who attempt to access the network and provide access that is appropriate based on the user's status.

WLANs are less secure than wired networks because they are easier to access and have weaker security configurations. The National Institute of Standards and Technology (NIST) recommended that all government agencies and private enterprises should establish security measures across all components of the WLAN including client devices and access points and that the security should be verified automatically on a continuing basis, and has released draft recommendations for WLAN security.[14] Organizations should limit access to their networks and provide different levels of security for guests and employees.

[14] *See* NIST, *Guidelines for Securing Wireless Local Area Networks (WLANs) (Draft) Special Publication 800-153* (rel. Oct. 25, 2011), *available at* http://csrc.nist.gov/publications/drafts/800-153/Draft-SP800-153.pdf.

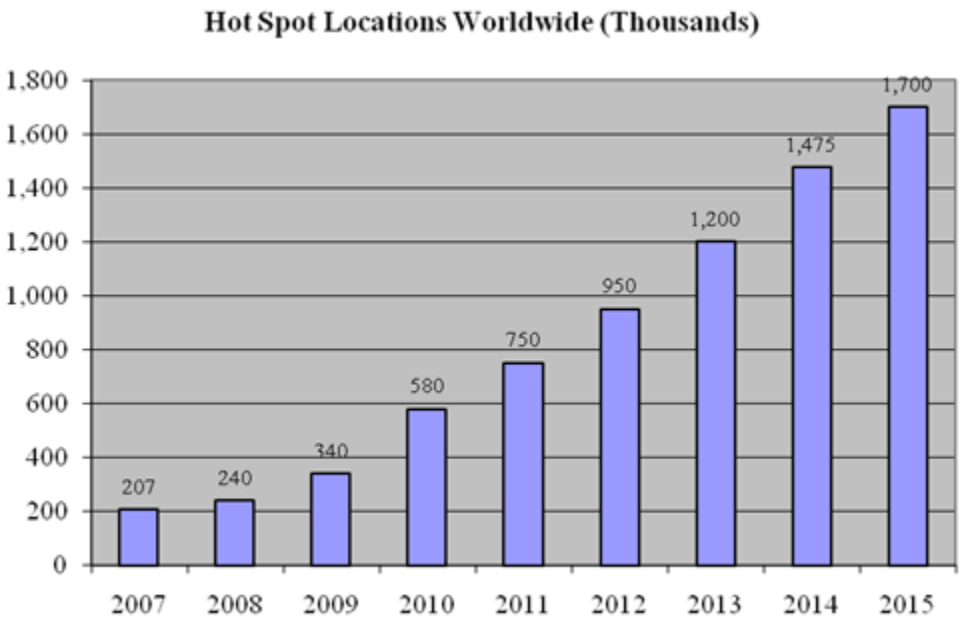
The healthcare industry is finding numerous applications for high-speed wireless networks. Hospitals with mobile staffs are ideal locations for WLANs enabling constant communication. Practitioners can access patient information at their bedsides enabling faster responses to emergency situations. Doctors can consult with specialists across the world at a moment's notice. Additionally, through telemedicine, patients in remote areas now can have access to doctors and testing facilities previously available only at the largest medical centers.

In order for WLANs to be fully accepted in the enterprise environment, they will have to work as well as wired alternatives with respect to reliability, consistency, and security. The entire industry is working very hard to assure that WLANs will meet those goals.

C. PUBLIC MARKET

The public market for Wi-Fi has grown significantly during the last few years. Worldwide, the number of hot spots passed 200,000 in 2007 and almost tripled by 2010 to reach 580,000. The number of hot spots worldwide grew an additional 29.3 percent in 2011 to reach 750.000. The number of hot spots worldwide is expected to grow at a compound annual rate of 22.7 percent through 2015 reaching 1.7 million. The number of hot spots will continue to grow because of the ease of establishing a hot spot combined with the growing demand for public Wi-Fi access fueled by the deployment of smartphones with their insatiable appetite for data.

Figure 10: Hot Spot Locations Worldwide



The United States has the largest number of Wi-Fi hotspots of any country in the world. Other countries with a large number of hot spots include China, France, the United Kingdom, and Germany.

There has been a shift in the business model with more hot spots converting to a free service. In 2010, both McDonalds and Starbucks converted from fee-based to free services. As a result, 2010 represented the first year when free hot spots outnumbered fee- based locations in the U.S. A driving force behind the growth of hot spots is the increase in the number of smart phones that can connect to the Internet either through 3G/4G or Wi-Fi connections. Wireless carriers have found data usage by smartphone owners staggering and often congesting their networks. As a result, they have looked for means to reduce some of the data traffic.

All the major mobile carriers, other than Sprint Nextel, have eliminated their unlimited data plans and have either instituted tiered pricing plans based on the amount of data used and charging an additional amount when that limit is reached or throttling the speeds back to 2G speeds for the reminder of the month[15]. As a result, smartphone users are seeking out free hot spots to download their information. Wi-Fi hot spots can download data much faster than 3G networks as they are backed by wired Internet connections.

VI. INNOVATIVE, NEXT-GENERATION WIRELESS DEVICES, APPLICATIONS, AND SERVICES REQUIRES SPECTRUM AVAILABILITY FOR FIXED AND MOBILE BROADBAND USE

The Commission has also requested information regarding the availability of the spectrum to enable mobile wireless services and on policy initiatives that might further promote mobile wireless competition.[16] The demand for mobile connectivity in the U.S. is growing exponentially. The increased demand for capacity-intensive access to the Internet can be seen in the rapid growth of smartphone devices, which essentially are handheld computers integrated with a mobile telephone.

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[15] *See, e.g.*, "As Networks Speed Up, Data Hits a Wall" New York Times, August 14, 2011, *available at* http://www.nytimes.com/2011/08/15/technology/as-mobile-networks-speed-up-data-gets-capped.html?_r=1&pagewanted=all.

[16] Wireless Competition NOI at ¶ 12-14.

As the Commission has previously recognized, without the quick reallocation of spectrum for wireless broadband, consumers could begin to experience wireless data gridlock.[17] Moreover, to ensure that wireless networks are robust to meet the ever-increasing consumer demand for broadband services, broadband providers must have the ability, through marketplace transactions, to freely access the spectrum they need across all bands. The demands for access to the information superhighway will exceed the capacity of the wireless "access road," which will result in the inability of consumers to send and receive information in the manner in which they are accustomed.[18] In addition, a recent FCC staff technical paper on mobile broadband analyzed three separate studies and noted that the average projection for wireless data growth by 2014 was 3,506%.[19]

This growth, fueled by consumer demand, cannot be sustained without adequate spectrum below 3 GHz. As Chairman Genachowski has stated: "Spectrum is the oxygen of our mobile networks…In fact, I believe that the biggest threat to the future of mobile in America is the looming spectrum crisis."[20] Moreover, spectrum both below and above 1 GHz is valuable to broadband providers depending on their particular needs. It is important that the Commission

[17] *Mobile Broadband: The Benefits of Additional Spectrum*, OBI Technical Paper Series, Federal Communications Commission (Oct. 2010) at 18, *available at* http://download.broadband.gov/plan/fcc-staff-technical-paper-mobile-broadband-benefits-of-additional-spectrum.pdf.; Julius Genachowski, Chairman, Federal Communications Commission, Remarks at CTIA Wireless IT & Entertainment: America's Mobile Broadband Future, 1-2 (Oct. 7, 2009) (Chairman Genachowski CTIA Remarks). *See also*, TIA, BROADBAND SPECTRUM: THE ENGINE FOR INNOVATION, JOB GROWTH, AND ADVANCEMENT OF SOCIAL PRIORITIES, March 2011, at 1-3 ("TIA Spectrum Whitepaper"), available at http://www.tiaonline.org/gov_affairs/issues/spectrum/documents/TIASpectrumWhitePaperFINAL.pdf.

[18] TIA Spectrum Whitepaper at 1-3.

[19] *Mobile Broadband: The Benefits of Additional Spectrum*, OBI Technical Paper Series, Federal Communications Commission (Oct. 2010) at 18, available at http://download.broadband.gov/plan/fcc-staff-technical-paper-mobilebroadband-benefits-of-additional-spectrum.pdf.

[20] Julius Genachowski, Chairman, Federal Communications Commission, Remarks at CTIA Wireless IT & Entertainment: America's Mobile Broadband Future, 1-2 (Oct. 7, 2009) (Chairman Genachowski CTIA Remarks).

not constrain providers' ability to acquire spectrum, and thus meet this consumer demand, by placing an artificial restriction on which frequencies providers can buy. The trade-offs providers make when purchasing spectrum are complex. While low-band spectrum may, in some circumstances, possess superior propagation characteristics, high- band spectrum, may be well suited for adding capacity, particularly in urban areas. Both low-band and high-band spectrum can provide significant benefits and should be made available to providers, without restriction, as they build out their 4G wireless networks.

Repurposing spectrum for wireless broadband use will bring economic benefits such as increased jobs and gross domestic product, productivity gains relating to an accelerated deployment of wireless broadband technologies and applications,[21] and societal benefits in areas such as public safety and personal security, healthcare, and education.[22] Therefore, it is critical that the government move promptly to free 300 MHz by 2015 and 500 MHz by 2020 for additional wireless broadband deployment. Accordingly, TIA supports the creation of mechanisms such as incentive auctions and flexible use licensing that will facilitate the fast, flexible repurposing of spectrum available for wireless broadband use and the ability of broadband providers to acquire different bands of spectrum without regulatory restrictions.[23]

[21] TIA Spectrum Whitepaper at ii, 3-7 (noting that a 1% increase in broadband deployment could generate as many as 300,000 new jobs; $17.4 billion in wireless broadband investment would increase GDP by $126 billion or more and create 4.5 to 6.3 million new jobs; and accelerated deployment of wireless broadband technologies and applications would generate productivity gains of almost $860 billion by 2016).

[22] *Id.* at 4-7. For example, increased access to spectrum for wireless broadband would enable the expansion of medical technology into remote areas, enable individuals to monitor and report on their own health, and make it possible to disseminate critical epidemic information and monitor for chemical or biological agents.

[23] *Id.* at 7-8.

The increasing demand for mobile broadband access has created a spectrum crisis [24] that jeopardizes economic productivity, job growth, innovation, and societal gains. Without the reallocation of spectrum for wireless broadband quickly, U.S. consumers could begin to experience wireless data gridlock. The demands for wireless access to the information superhighway will exceed the capacity of the wireless "access road," which will result in the inability of consumers to send and receive information in the manner in which they are accustomed. As venture capitalist and former Wall Street technology and internet analyst Mary Meeker points out, as a corporation, the U.S. has underinvested in technology, a tool essential for competing in the global marketplace.[25]

Policymakers can change that by investing in the future of mobile broadband, driving innovation and prosperity. Accordingly, TIA supports granting the Commission the authority to conduct voluntary incentive auctions and encourage policymakers to utilize other mechanisms that will rapidly and dramatically increase the amount of spectrum for wireless broadband.

Additionally, wireless machine-to-machine (M2M) connections continue to show steady growth. M2M services improve safety and efficiency in areas including manufacturing, energy conservation, consumer alerts on products needing service or recall, or updating digital billboards to inform drivers of road conditions or nearby services. Wireless M2M connections

[24] Julius Genachowski, Chairman, Federal Communications Commission, Remarks at CTIA Wireless IT & Entertainment: America's Mobile Broadband Future, 1-2 (Oct. 7, 2009) (Chairman Genachowski CTIA Remarks).

[25] *See* Mary Meeker, USA Inc.: Red, White, and Very Blue, Bloomberg Businessweek (Fe. 24, 2011 available at http://www.businessweek.com/magazine/content/11_10/b4218000828880.htm.

are expected to exceed 232.5 million in 2014 and 297 million in 2015.[26] Thus, capacity-intensive uses such as video, which are now available to mobile users, will rapidly be sharing bandwidth with innovative M2M services - further straining wireless networks that are already near capacity.

[26] *See, e.g.*, Cellular M2M Connections Will Show Steady Growth to Top 297 Million in 2015, ABI Research (Oct. 10, 2010) available at http://www.abiresearch.com/press/3528-.

VII. CONCLUSION

As noted above, the mobile wireless marketplace is both highly competitive and a center of significant technological innovation. The Commission should continue to foster competition and technological advancement by adopting policies that encourage investment in intelligent network infrastructure, make spectrum available for 4G wireless broadband services , promote consumer access to information and connectivity of devices, and allow the market, instead of government, to choose winners and losers. As a general matter, TIA encourages the Commission to ensure that a balanced and thoughtful approach to broadband policy must combine appropriate government action with the power of the free market. Notably, market participants are reluctant to invest in new or upgraded infrastructure when their return on their investment is uncertain. In the face of such uncertainty, investors are likely to take their capital to other sectors offering better opportunities for gain. TIA thus urges the Commission to resist the impulse to impose detailed prescriptive regulations with respect to the ways in which competing platform providers operate their next-generation networks and acquire the spectrum necessary to build those vital networks. [27]

TIA has detailed in various Commission dockets the ways in which the Commission could promote the mobile wireless marketplace by adopting policies that promote private investment and make the best use of public resources. For the reasons set forth above, TIA urges the Commission to consider and endorse the pro-competitive nature of wireless handset exclusivity

[27] *See, e.g.*, Comments of TIA, GN Docket No. 09-51, at 6 (filed Jun. 5, 2009).

agreements, its existing spectrum screen policies, and policies that promote adoption of wireless broadband.

Respectfully submitted,

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