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**Before the  
Federal Communications Commission  
Washington, DC 20554**

In the Matter of )  
)  
Implementation of Section 6002(b) of the ) WT Docket No. 11-186  
Omnibus Budget Reconciliation Act of 1993 )  
)  
Annual Report and Analysis of Competitive )  
Market Conditions With Respect to Mobile )  
Wireless, including Commercial Mobile )  
Services )

To: The Commission

**COMMENTS OF VERIZON WIRELESS**

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## TABLE OF CONTENTS

SUMMARY .....	iv
I. THE MOBILE ECOSYSTEM HAS ENTERED A DYNAMIC COMPETITIVE ERA IN WHICH PARTICIPANTS MIX AND MATCH COMPONENTS TO MAXIMIZE CONSUMER VALUE .....	1
II. THE MARKET FOR MOBILE WIRELESS SERVICES IS ROBUSTLY COMPETITIVE .....	7
A. Mobile Providers Compete Fiercely on Price and Numerous Other Factors.....	8
1. Already Vigorous Price Competition Has Intensified .....	8
a. Data Consumption Continues to Surge While Tiered Pricing Options Enhance Value and Expand Consumer Choices.....	12
b. Expanding Low-Cost Prepaid Offerings Provide Consumers Increased Choices .....	17
c. Carriers Remain Highly Competitive on Postpaid Pricing, Even Though Subscriber Additions Are Slowing.....	24
d. Messaging Use Continues to Rise While Prices Plummet .....	26
e. Operators Continue to Offer Varied Service Bundles, Which Increases Competitive Pressure on Rival Providers.....	28
2. Competition on the Basis of Non-Price Factors Is Robust .....	30
a. Network Performance and Coverage Remain Central Elements of Competition, Driving Further Investment .....	30
b. Rival Providers Compete to Provide Meaningful Customer Information and Quality Customer Care.....	39
c. Wireless Advertising Also Reveals the Fierce State of Competition.....	44
B. The Structure of the Mobile Market Demonstrates its Competitiveness .....	44
1. The Wireless Industry Structure Drives This Dynamic and Highly Competitive Market .....	44
a. Diverse Providers Now in the Marketplace Include Over 175 Facilities-Based Operators and Many MVNOs .....	45
b. Ease of Entry Has Increased Competitive Pressure on All Providers .....	55
2. The U.S. Market Compares Favorably Internationally.....	62
C. The Competitive Marketplace Has Led to Rising Consumer Satisfaction .....	66
1. Surveys Consistently Report High Numbers of Satisfied Customers.....	67
2. The Level of Consumer Complaints Is Minimal .....	68

3.	Consumer Satisfaction Is Underscored by Low Churn Despite Low Barriers to Switching .....	69
III.	THE MARKET SEGMENTS FOR DEVICES, APPLICATIONS, AND CONTENT ARE DRIVING COMPETITION IN THE MOBILE ECOSYSTEM.....	73
A.	The Wireless Device Market Is an Increasingly Important Component of Consumer Choice.....	73
1.	The Manufacturer Market Is Large and Growing, with Ever-Shifting Market Shares .....	74
2.	The Operating System Segment Is Producing Immense Innovation and Choice .....	78
3.	The Device Market Is Remarkably Diverse and Expanding .....	81
B.	Applications, Content, and Mobile Commerce Spur Usage that Fuels the Competitive Mobile Marketplace .....	88
1.	Applications Are Exploding in Number and Appeal.....	89
2.	Paid and Unpaid Content Is Shuttling Across Platforms to Follow Consumer Demand.....	92
3.	Apps for Mobile Commerce Are Growing the Economy.....	94
IV.	THE INPUT MARKET SEGMENTS ILLUSTRATE A COMPETITIVE LANDSCAPE.....	97
A.	While More Spectrum Will Be Needed, Spectrum Is Not a Competitive Constraint.....	97
B.	Competition in Backhaul Provides Ample Choices for Mobile Providers to Meet Their Needs.....	99
C.	The Infrastructure Sector Is Highly Competitive and Expanding in Response to Heightened Demand .....	107
V.	THE <i>FIFTEENTH REPORT</i> SUFFERS FROM SERIOUS FLAWS .....	111
A.	The <i>Fifteenth Report</i> Again Errs in Failing to Make an Effective Competition Finding .....	112
B.	The <i>Fifteenth Report</i> 's Spectrum Analysis Is Unsubstantiated and Unsound .....	115
1.	The <i>Fifteenth Report</i> Continues to Wrongly Exclude MSS and WCS Spectrum Suitable for Mobile Services.....	116
a.	The Exclusion of Spectrum Suitable for Mobile Service Defies Precedent .....	117
b.	MSS ATC Spectrum Is Suitable to Provide, and Has the Potential to Compete with, Mobile Services.....	120
c.	WCS Spectrum Is Suitable to Provide, and Has the Potential to Compete with, Mobile Services.....	124

2.	No Basis Exists for Affording Any Competitive Significance to a 1 GHz Threshold.....	125
a.	The <i>Fifteenth Report</i> Places Insufficient Weight on the Capacity Benefits of Higher Band Spectrum.....	126
b.	The <i>Fifteenth Report</i> Over-Emphasizes the Importance of Lower Band Propagation Characteristics.....	130
c.	The <i>Fifteenth Report</i> Uses Incomplete Auction Data as a Proxy for Spectrum Value Above and Below 1 GHz.....	132
3.	The <i>Fifteenth Report</i> Does Not Consistently Attribute Clearwire Spectrum to Sprint Nextel.....	135
C.	The <i>Fifteenth Report</i> Continues to Place Undue Emphasis on Market Structure at the Expense of Market Behavior .....	136
1.	The <i>Fifteenth Report</i> Continues to Focus Too Heavily on HHI Measures to Assess Competitive Trends .....	137
2.	The Exclusion of MVNOs as Distinct Market Participants Skews the <i>Fifteenth Report's</i> Evaluation of Concentration .....	141
3.	An Evaluation of the Effects of Consolidation Reveals Significant Consumer Welfare Benefits.....	144
D.	The <i>Fifteenth Report</i> Too Often Fails to Acknowledge that Today's Market is Advancing Consumer Welfare .....	145
1.	The <i>Fifteenth Report</i> Does Not Acknowledge Consumer Satisfaction as a Basis for Low Churn.....	145
2.	The <i>Fifteenth Report</i> Avoids Discussion of Falling Postpaid Service Prices.....	147
E.	The <i>Fifteenth Report</i> Again Errs in Using Investment and Profitability as Indices of Competition.....	148
1.	The <i>Fifteenth Report</i> Overstates the Relevance of the Capex/Revenue and Investment/Subscriber Ratios, and Fails to Account for Broader Economic Conditions.....	148
2.	Accounting Profit Is Not a Reliable Indicator of Competition.....	151
VI.	CONCLUSION.....	153

## SUMMARY

The mobile wireless ecosystem is even more robust, competitive, and innovative than it was last year and the year before. For the first time ever, there are more mobile wireless connections than there are Americans. Prices continue to drop, data service usage is skyrocketing, and investment is increasing substantially. Together with the complementary market sectors for devices, operating systems, applications, and content, mobile service providers offer ever-increasing choices for consumers. Traditional market boundaries are quickly eroding, as participants from all quarters of the mobile ecosystem enter one another's lines of business, compete to provide value, and win customers. More than ever, the various sectors of the mobile ecosystem are deeply intertwined, resulting in "effective competition" that is more robust than ever before.

The market for mobile wireless service itself is highly competitive. The trend towards lower prices and greater value has intensified, with voice revenue per customer declining 30 percent between 2005 and 2010, price per message declining from 5.7 cents to 0.9 cents over that same period, and price per megabyte of data service declining from 47 cents to 5 cents between 2008 and 2010, fueling mobile broadband adoption. Prepaid providers continue to offer aggressive pricing, prompting competitive responses in the postpaid segment. Competitive rivalry is also driving billions of dollars into 3G and 4G network deployments, as carriers invested \$24.9 billion in 2010, a 22 percent increase over 2009.

The dynamic and highly competitive nature of the overall market for wireless services is supported and driven by numerous and diverse participants striving to attract and keep customers in the face of a multitude of alternative providers. This current market structure and ability of new entrants to compete further strengthen mobile services competition. The marketplace

includes more than 175 facilities-based providers – including Clearwire, a bevy of regional carriers, and numerous smaller entities that are deploying 3G and 4G services and providing additional facilities-based competition. In addition, the reseller/MVNO segment continues to exert substantial competitive pressure. The largest MVNO, TracFone, ranks fifth among all providers of mobile service. Consumers are also increasingly relying on WiFi hotspots as an alternative to licensed mobile broadband service. The U.S. wireless market compares favorably to the markets in other nations. Among OECD nations, only Canada has as many competitive providers, and the U.S. HHI score is among the very lowest. Consumer satisfaction levels, as assessed by third parties, are high, and churn levels are low as the average customer remains with his or her provider far longer than any contractual terms require.

Complementary market segments are also highly competitive. The wireless device market continues to exhibit remarkable innovation and diversity, and many customers are making wireless choices based largely on the device itself. The operating system segment is also growing, and playing a leading role in customer choice. The manufacturer segment is diverse and growing. Manufacturers typically supply multiple providers, and providers offer devices from multiple manufacturers. Companies such as Dell and Garmin have recently entered the wireless device market. More than 70 new tablets were introduced in 2011. Smartphone usage continues to explode, with more and more diverse offerings coming to market every month. New devices, such as USB modems, MiFi hotspots, e-readers, and M2M devices – offered by a growing number of vendors – compete for consumers and offer still more options.

The applications, content, and mobile commerce segments are also fueling innovation and dynamism in the mobile service market. Both the number of applications available and the demand for those applications rose dramatically during 2010, with at least 10 app stores

offering well over 1.5 million apps in total – overwhelmingly produced by third parties. Content providers have moved aggressively to bring their offerings to mobile devices, competing with carriers’ own offerings.

Input market segments are also growing even more competitive. While more spectrum is necessary to fuel the mobile market, additional spectrum resources are coming into use, and secondary markets provide additional access to spectrum resources. Carriers, moreover, have invested billions of dollars to optimize their networks for efficient spectrum use. The backhaul market has become even more competitive too. As 3G and 4G networks have proliferated, the business case for competitive backhaul has developed significantly, with new entrants providing backhaul relying on fiber, cable, powerline, and fixed wireless platforms. The infrastructure market is also expanding in response to heightened demand. Cell-site growth has led to a diversity of siting options, preventing any one company or carrier from controlling the infrastructure segment.

As the Commission incorporates these facts and trends into its development of the *Sixteenth Report*, it should correct the analytical errors in the *Fifteenth Report* that painted an incorrect portrait of the wireless marketplace. For example, the Commission must declare the mobile wireless market “effectively competitive.” Congress required it to render such a judgment, and the facts lead to no other conclusion. Moreover, the Commission must remedy errors in its prior spectrum analysis. The *Fifteenth Report* continued to exclude MSS and WCS spectrum among the bands available for mobile wireless service, even though these bands are suitable for mobile wireless use, and the Commission has taken a variety of actions to facilitate such use. Further, the *Fifteenth Report* overstated the relative advantages of lower-band spectrum. Both upper- and lower-band spectrum afford providers relative advantages, and a

departure from the Commission's prior refusal to make distinctions based on frequency bands is unwarranted. In addition, the *Fifteenth Report* does not consistently attribute Clearwire spectrum to Sprint Nextel, notwithstanding Sprint's majority stake in Clearwire.

The *Sixteenth Report* must also correct the prior *Report's* undue focus on HHI measures to gauge concentration. The *Fifteenth Report* acknowledges the limited value of such measures in markets with high fixed costs (such as the mobile wireless market), and stresses the importance of market *conduct*. It nevertheless places heavy emphasis on HHI, applying tools applicable to traditional markets to suggest undue levels of concentration. The *Fifteenth Report's* concentration analysis also wrongly excludes MVNOs as distinct market participants, attributing such providers' customers to the underlying facilities-based provider. This approach is incompatible with the Commission's treatment of resellers in other contexts, and should be modified.

Finally, the *Sixteenth Report* should do more to acknowledge the ways in which today's market is advancing consumer welfare. For example, low churn levels reflect consumer satisfaction, not high switching costs – a fact underscored by the typical subscriber lifetime with a provider, which far outstrips traditional contract lengths. The *Sixteenth Report* should also address declines in postpaid service prices, which were ignored entirely in the *Fifteenth Report*. On the other hand, the Commission should focus less on the capex-to-revenues and investment-per-subscriber ratios, which fail to recognize the nature of wireless network investment. It should likewise discontinue its reliance on measures of accounting profit, which economists do not consider relevant for competition-policy purposes.

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To: The Commission

**COMMENTS OF VERIZON WIRELESS**

Verizon Wireless submits these initial comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) *Public Notice* seeking input and data on mobile wireless competition for the Sixteenth Annual Report on the State of Competition in Mobile Wireless, including Commercial Mobile Radio Services (“*Sixteenth Report*”).<sup>1</sup>

**I. THE MOBILE ECOSYSTEM HAS ENTERED A DYNAMIC  
COMPETITIVE ERA IN WHICH PARTICIPANTS MIX AND MATCH  
COMPONENTS TO MAXIMIZE CONSUMER VALUE**

The facts here are compelling: the mobile market is effectively competitive, driven not only by vibrant rivalry among carriers, but also by the combinations (or value “stacks”) of devices, operating systems, applications, and content that comprise today’s consumer offerings. To be sure, carriers continue to compete vigorously on the basis of the services they provide – on

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<sup>1</sup> Wireless Telecommunications Bureau Seeks Comment on the State of Mobile Wireless Competition, WT Docket No. 11-186, *Public Notice*, DA 11-1856 (WTB Nov. 3, 2011) (“*Public Notice*”).

price, broadband speeds, coverage, and network quality, for example – but the mobile ecosystem also demands constant innovation in connection with each of the components or “modules” that comprise the broader consumer stacks. Today’s market fosters “mix-and-match competition” across an expanding field of innovation, as competitors offering complementary modules appeal directly to consumers. This mobile ecosystem has led to the precise outcomes that one expects from a rivalrous, competitive market: constant innovation, substantial investment, falling prices, and entry by new providers in various market sectors. All of these developments directly benefit consumers.

Under Chairman Genachowski’s leadership, in 2009 the Commission retooled its annual “CMRS Competition Report” in recognition of this emerging dynamic. Beginning with the *Fourteenth Report*, the Commission expanded its review “across the entire mobile wireless ecosystem,” a complex web of interrelated sectors encompassing mobile services, devices, operating systems, applications, and content.<sup>2</sup> Today, developments occurring within and among these modules are generating greater, more dynamic wireless competition than previously recognized.

The strength of this market dynamic lies in the expansion of components that affect mobile consumer choice. Some consumers may choose principally on the basis of the wireless service offering itself – *i.e.*, they will choose a preferred carrier, or select the lowest priced offering, or pick an optimal data plan. For a growing number of other consumers, however, the availability of particular devices, operating systems, applications, or content may dominate over

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<sup>2</sup> See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, *Fourteenth Report*, 25 FCC Rcd 11407, 11407 ¶ 2 (2010) (“*Fourteenth Report*”).

the choice of carrier. Some consumers, for example, have a strong preference for a specific device or a particular operating system. For those customers, the identity of the underlying service provider is secondary. Other consumers may choose a device or service that is provided, and branded, directly by a retailer (an e-reader, for example), and may not even know which wireless provider supplies the underlying connectivity. Yet other consumers will choose a broadband device (a tablet, for example) that relies exclusively on WiFi connectivity, eschewing licensed mobile wireless service altogether. Given the multitude of factors driving customer decisions, each competitor now has increasing opportunities to craft a distinct relationship with the user based on its unique offerings and business strategy – a point the Commission has come to recognize.<sup>3</sup>

***The Mobile Ecosystem Drives Constant Innovation.*** One consequence of the new competitive landscape is that *all* providers in the ecosystem are constantly challenged to offer the very best value stacks for their existing and prospective customers – and to partner with providers of complementary components to be able to do so. In order to survive, competitors must consistently innovate, rendering the market especially dynamic:

In innovation markets, firms compete not only by seeking to offer the best products at the lowest prices, but also – and primarily – by making investments intended to create entire new categories of

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<sup>3</sup> For example, the *Fifteenth Report* stated that “consumers are showing an increasing loyalty to particular operating systems or device platforms.” Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, *Fifteenth Report*, 26 FCC Rcd 9664, 9753 ¶ 143 (2011) (“*Fifteenth Report*”). The *Public Notice* opening this docket states that “control over the types of applications that customers can access on their devices [has to some extent] shifted from service providers to device makers and/or operating system developers during 2010 and 2011[.]” *Public Notice* at 7.

products, or to substantially reduce the costs of making existing ones.<sup>4</sup>

For example, in the face of the iPhone's meteoric entry into the mobile market on the AT&T network, Verizon Wireless and Google agreed to jointly develop wireless devices on the Android operating system platform, and then teamed up with Motorola to develop the Droid family of devices. Sprint Nextel, in turn, joined forces with HTC to develop EVO, another Android device and the first 3G/4G device in the U.S. For its part, Microsoft launched a new Windows Mobile operating system as a competitor to the fast-evolving iPhone and Android environments, and further bolstered its presence in the communications market by acquiring Skype. In this world of mix-and-match competition, some entities will flourish and earn a return on invested capital, while others will need to find new paths forward. As the CEO of Nokia recognized earlier this year in an internal memorandum:

The battle of devices has now become a war of ecosystems, where ecosystems include not only the hardware and software of the device, but developers, applications, ecommerce, advertising, search, social applications, location based services, unified communications and many other things.... We're going to have to decide how we either build, catalyze or join an ecosystem.<sup>5</sup>

Soon thereafter, Nokia and Microsoft announced a partnership whereby Nokia would shift from its own Symbian product to Windows Mobile as its primary operating system, collaborating closely with Microsoft on the development and growth of that system. Innovations such as these

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<sup>4</sup> JEFFREY A. EISENACH, THEORIES OF BROADBAND COMPETITION 24 (draft June 20, 2011), <http://ssrn.com/abstract=1868381> ("THEORIES OF BROADBAND COMPETITION").

<sup>5</sup> Chris Ziegler, *Nokia CEO Stephen Elop Rallies Troops in Brutally Honest 'Burning Platform' Memo?* ENGADGET, (Feb. 8, 2011), <http://www.engadget.com/2011/02/08/nokia-ceo-stephen-elop-rallies-troops-in-brutally-honest-burnin/>.

(whether pursued by partnerships of individual entities) stimulate still more innovation, bringing increasing value to consumers.

*The Mobile Ecosystem Requires Participants to Cooperate and Compete.* A second consequence of this dynamic is that mobile carriers simultaneously cooperate and compete with providers of services that both complement and substitute for their own products. In the contemporary marketplace, “[m]ultiple companies that are not normally thought of as competitors but as complements, and that do not technically operate in the same product markets, challenge one another through the creation of competing value propositions offered to the same set of consumers.”<sup>6</sup> Thus, Verizon Wireless partners with Google to develop and advance the Android operating system, while Verizon and Google compete vigorously in providing cloud computing services. Until this year, Verizon Wireless competed against the Apple iPhone offering, available only over the AT&T network, even as the two companies partnered to offer an iPad with Verizon Wireless 3G service. Today, Verizon Wireless and Apple partner to offer both the iPhone and the 3G iPad, and these devices compete against Apple’s WiFi-only iPod and iPad and other products like the Motorola Xoom tablet with Verizon Wireless 4G LTE service.

Even within the bounds of such partnerships, providers of individual complementary modules vie to maximize their own relative relationship and value to the consumer, which can

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<sup>6</sup> JONATHAN SALLET, THE CREATION OF VALUE: THE BROADBAND VALUE CIRCLE AND EVOLVING MARKET STRUCTURES 12 (Apr. 4, 2011) (“BROADBAND VALUE CIRCLE”), <http://www.annenberglab.com/viewresearch/27>. See also THEORIES OF BROADBAND COMPETITION at 4-5 (“Markets where modularity is present sometimes make mischief with traditional economic notions of ‘vertical’ and ‘horizontal’ relationships: producers may be both ‘upstream’ in the sense of providing inputs to ‘customer facing’ retailers, and ‘downstream’ in the sense of selling both their own products and the products of their ‘competitors’ directly to customers. While such firms must cooperate to make their products work together, they also compete for the economic rents generated by a successful platform.”).

improve their bargaining position within a stack and foster long-term allegiance. These shifting competitive sands force all parties to constantly reassess the consumer landscape, invest in innovation, and forge new alliances to deliver winning consumer experiences. They simultaneously force parties to adapt at all times: More capable devices beget demand for better connectivity, which in turn permits better applications and higher-quality content, generating demand for still better devices and operating systems. This virtuous cycle leads to better offerings and enhanced consumer value.

*The Mobile Ecosystem is Not Carrier Centric.* A third, related consequence of the new market dynamic is that, far from acting alone as alleged industry gatekeepers, service providers must (like all other entities providing value in the stack) continue to compete fiercely to attract and retain customers through innovative partnerships. “Walled gardens” have given way to a wide open market in which success depends on a carrier’s ability to partner with providers of complementary components and offer consumers access to the devices, content and applications of their choice. Carriers who do not do so are destined to fail. This fact deeply undercuts traditional carrier-centric views regarding analysis of the wireless marketplace in the broadband era:

Just as pre-Copernican astronomers, seeing the universe from their Earthbound perspective, mistakenly believed the Earth was the center of the universe, it is entirely natural that the modern telecommunications intelligentsia would see broadband as the center of the Internet ecosystem. But it is not. For purposes of competition analysis, at least, broadband is a complement among complements, a module among modules.<sup>7</sup>

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<sup>7</sup> THEORIES OF BROADBAND COMPETITION at 35.

Put differently, service providers compete vigorously, both among themselves *and* with producers of complements, to generate value and win the favor of consumers.

In sum, while the policy goals associated with competitive markets – falling prices, breathtaking innovation, increasing investment, and higher customer satisfaction – remain constant, the mobile wireless market itself is in constant flux. The increasing importance of devices, operating systems, applications, and content – which the Commission has noted in its last two *Reports* – is producing a highly competitive maelstrom, in which the roles played by individual firms are fluid and subject to constant challenge. Providers face intense pressure not only from their direct rivals, but also from providers of other modules, each of which can develop unique value stacks to capture consumer interest. The consequence of this pressure is just what we would expect: A market in which consumers can choose among an amazing array of new products and services, offered at lower and lower prices, and can rightly expect that tomorrow’s offerings will be even more wondrous, competitive, and innovative than today’s.

## **II. THE MARKET FOR MOBILE WIRELESS SERVICES IS ROBUSTLY COMPETITIVE**

One manifestation of dynamic competition in the mobile ecosystem is the intense level of rivalry among wireless service providers. Wireless providers compete on multiple dimensions, offering a diverse array of pricing, service, device, application, and customer care options designed to meet consumer needs. The trajectory of these trends is assured by the competitive dynamics and constantly evolving nature of the mobile services market. This race has led to rising consumer satisfaction with their wireless experience, reduced complaints, and increasing consumer loyalty. Taken together, these factors demonstrate that the U.S. wireless market is the most competitive in the world.

**A. Mobile Providers Compete Fiercely on Price and Numerous Other Factors**

Price competition is playing a significant role in this shifting market landscape. As discussed further in the subsections that follow, this competition is evident across all segments of the mobile wireless market and warrants increased attention in the Commission's *Sixteenth Report*. Notably, providers are responding to surging data consumption by increasing tiered pricing options, which in turn are enhancing value for consumers and fueling additional data services adoption. In addition, low-cost prepaid offerings are feeding the ongoing shift from postpaid subscriptions, while postpaid pricing remains highly competitive. Finally, messaging use is rising as prices plummet, and operators are continuing to compete by offering a wide variety of service bundles to consumers.

**1. Already Vigorous Price Competition Has Intensified**

Relentless competition continues to drive prices lower across all mobile service segments. For example, the average local monthly bill ("ALMB") has been declining on average 0.5 percent year over year,<sup>8</sup> and for year-end 2010 was down 1.97 percent.<sup>9</sup> This continued a recent decline in the ALMB.<sup>10</sup> Indeed, as the mobile wireless industry has evolved over the last two decades from a voice-centric model to one that includes messaging and data services,

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<sup>8</sup> CTIA, CTIA's TOP-LINE SEMI-ANNUAL WIRELESS INDUSTRY SURVEY RESULTS 8 (2011), [http://files.ctia.org/pdf/CTIA\\_Survey\\_MY\\_2011\\_Graphics.pdf](http://files.ctia.org/pdf/CTIA_Survey_MY_2011_Graphics.pdf) ("CTIA 2011 TOP-LINE SEMI-ANNUAL WIRELESS INDUSTRY SURVEY").

<sup>9</sup> ROBERT F. ROCHE & LIZ DALE, CTIA, CTIA'S WIRELESS INDUSTRY INDICES 191 (May 2011) (providing year-end 2010 results) ("CTIA 2010 WIRELESS INDUSTRY INDICES").

<sup>10</sup> *Id.* at 195.

wireless providers have “competed relentlessly against each other,” and the result has been a clear decline in prices for each of the component services.<sup>11</sup>

For voice service, the revenue per customer (a proxy for what consumers pay each month) *declined 30 percent* over the five year period between 2005 and 2010 from \$47.46 to \$33.02 per month, while at the same time monthly usage rose almost 10 percent from 902 to 990 minutes:<sup>12</sup>



Source: Recon Analytics<sup>13</sup>

In the case of messaging, the effective price per message *declined 84 percent* over the five year period between 2005 and 2010 from 5.7 cents to 0.9 cents, while the average number of messages sent or received each month increased from 25 to 728 – a 29-fold increase:<sup>14</sup>

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<sup>11</sup> Roger Entner, *What is the price of a megabyte of wireless data?*, FIERCE WIRELESS, Apr. 13, 2011, <http://www.fiercewireless.com/story/entner-what-price-megabyte-wireless-data/2011-04-13> (“Price of a Megabyte of Wireless Data”).

<sup>12</sup> *Id.*

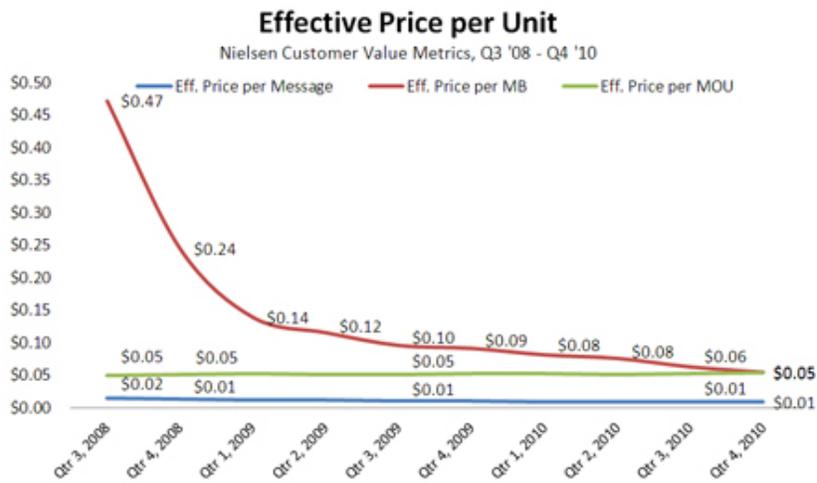
<sup>13</sup> *Id.*

<sup>14</sup> *Id.*



Source: Nielsen Customer Value Metrics<sup>15</sup>

And for data services, the effective price per megabyte has declined from 47 cents per megabyte in the third quarter of 2008 to about 5 cents per megabyte in the final quarter of 2010 – a decrease of more than 89 percent at a time when the consumption of data is exploding:<sup>16</sup>



Source: Nielsen Customer Value Metrics<sup>17</sup>

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

These price declines are forecast to continue: According to IDC, “[v]oice services pricing will continue to experience sustained erosion” and data services will see “[d]eclining prices” through 2015.<sup>18</sup>

These industry-wide price trends are playing out in Average Revenue Per User (“ARPU”) as well. Voice ARPU declined 7.5 percent in 2010 (from \$34.26 to \$31.68 per month) and is projected to decline 8.3 percent in 2011 (from \$31.68 to \$29.05 per month), which would mark the seventh straight year-over-year decline.<sup>19</sup> Data ARPU increased 16.6 percent in 2010 (from \$12.10 to \$14.12 per month) – even though data traffic more than doubled – and is only projected to increase 8.5 percent in 2011 (from \$14.12 to \$15.32 per month).<sup>20</sup> Overall, total ARPU decreased 1.2 percent in 2010 (from \$46.37 to \$45.79 per month) and is projected to decrease 3.1 percent in 2011 (from \$45.79 to \$44.36 per month).<sup>21</sup> Again, this would mark the seventh straight year-over-year decline.<sup>22</sup>

The bottom line for consumers is improved overall value. Wireless CPI, the wireless telephone service component of the Consumer Price Index, fell 3.6 percent from December 2009 to December 2010,<sup>23</sup> at the same time the CPI for all items increased by 1.5 percent.<sup>24</sup> Indeed,

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<sup>18</sup> SUZANNE HOPKINS & CARRIER MACGILLIVRAY, IDC, U.S. MOBILE CONSUMER SERVICES 2011-2015 FORECAST: CONSUMERS DRIVE SMARTPHONE PENETRATION 8-9 (Aug. 2011) (“U.S. MOBILE CONSUMER SERVICES 2011-2015 FORECAST”).

<sup>19</sup> JOHN C. HODULIK & BATYA LEVI, UBS INVESTMENT RESEARCH, US WIRELESS 411, 3 (Aug. 17, 2011) (“UBS WIRELESS 411 REPORT”).

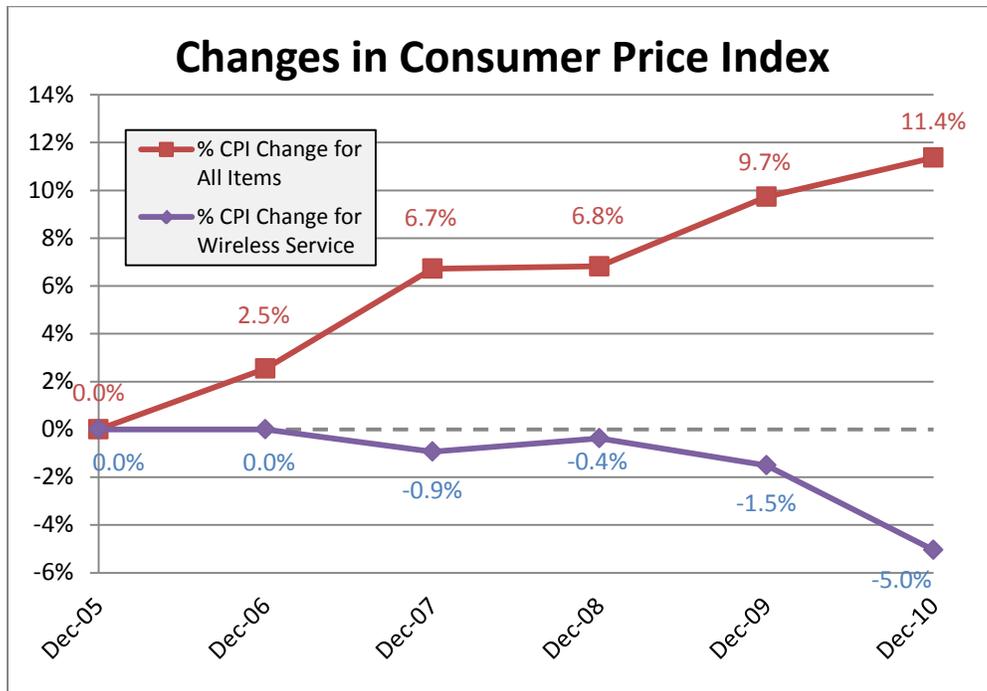
<sup>20</sup> *Id.*; CTIA 2010 WIRELESS INDUSTRY INDICES at 218; *see also* Robert Roche, *Wireless Data Traffic Grew 110% from 2009-2010*, CTIA: THE WIRELESS ASSOCIATION® BLOG, May 31, 2011, <http://blog.ctia.org/2011/05/31/wireless-data-traffic-grew-110-from-2009-2010/> (finding 110% growth rate over entirety of 2010).

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> *See* CTIA 2010 WIRELESS INDUSTRY INDICES at 270.

from December 2005 to December 2010, the wireless CPI has *fallen* 5.0 percent<sup>25</sup> while the overall CPI for all items has *increased* 11.4 percent.<sup>26</sup>



Source: CTIA 2010 Wireless Industry Indices and U.S. Dep’t of Labor<sup>27</sup>

**a. Data Consumption Continues to Surge While Tiered Pricing Options Enhance Value and Expand Consumer Choices**

Mobile data consumption continues to surge in the U.S.,<sup>28</sup> increasing two to five times on major U.S. networks in 2010.<sup>29</sup> With this “data tsunami,” the United States has become a global

<sup>24</sup> See U.S. DEP’T OF LABOR, BUREAU OF LABOR STATISTICS, CONSUMER PRICE INDEX: ALL URBAN CONSUMERS – (CPI-U), U.S. CITY AVERAGES, ALL ITEMS, <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt> (“CPI – ALL ITEMS”).

<sup>25</sup> See CTIA 2010 WIRELESS INDUSTRY INDICES at 268-70.

<sup>26</sup> See CPI – ALL ITEMS.

<sup>27</sup> CTIA 2010 WIRELESS INDUSTRY INDICES at 268-70; CPI – ALL ITEMS.

<sup>28</sup> See, e.g., CHETAN SHARMA, CHETAN SHARMA CONSULTING, US WIRELESS DATA MARKET – Q4 2010 AND 2010 UPDATE 3 (Aug. 2011),

<http://www.chetansharma.com/US%20Wireless%20Market%20Q4%202010%20and%202010%20Update%20-%20Feb%202011%20-%20Chetan%20Sharma%20Consulting.pdf> (“US WIRELESS DATA MARKET – Q4 2010 AND (continued on next page)

leader in data consumption<sup>30</sup> and will soon become the top nation in per subscriber mobile data consumption, surpassing Sweden.<sup>31</sup> In response to the data explosion and accompanying network capacity challenges, mobile providers continue to offer a variety of tiered pricing plans that make “the entry point ... more affordable than it was previously.”<sup>32</sup> In turn, “[d]eclining prices will help drive additional data services adoption, which in aggregate will outweigh data pricing erosion.... A greater variety of tiered pricing options will allow consumers to choose a package that is the right match for their lifestyle.”<sup>33</sup>

One analyst reports that in 2010, the average U.S. consumer’s data usage grew 132 percent to over 350 megabytes per month.<sup>34</sup> Cisco expects this trend to continue at a rapid pace, with aggregate data traffic in North America multiplying 20 times over through 2015:<sup>35</sup>

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2010 UPDATE”); U.S. MOBILE CONSUMER SERVICES 2011-2015 FORECAST at 4; SUZANNE HOPKINS & CARRIE MACGILLIVRAY, IDC, NEW DATA PRICING MODELS IN THE U.S.? NOT JUST YET 1 (June 29, 2011) (“NEW DATA PRICING MODELS”).

<sup>29</sup> US WIRELESS DATA MARKET – Q4 2010 AND 2010 UPDATE at 3.

<sup>30</sup> See CHETAN SHARMA, CHETAN SHARMA CONSULTING, COMPETITION AND THE EVOLUTION OF MOBILE MARKETS: A STUDY OF COMPETITION IN GLOBAL MOBILE MARKETS, WORKING PAPER 32 (Apr. 2011) (“COMPETITION AND THE EVOLUTION OF MOBILE MARKETS”).

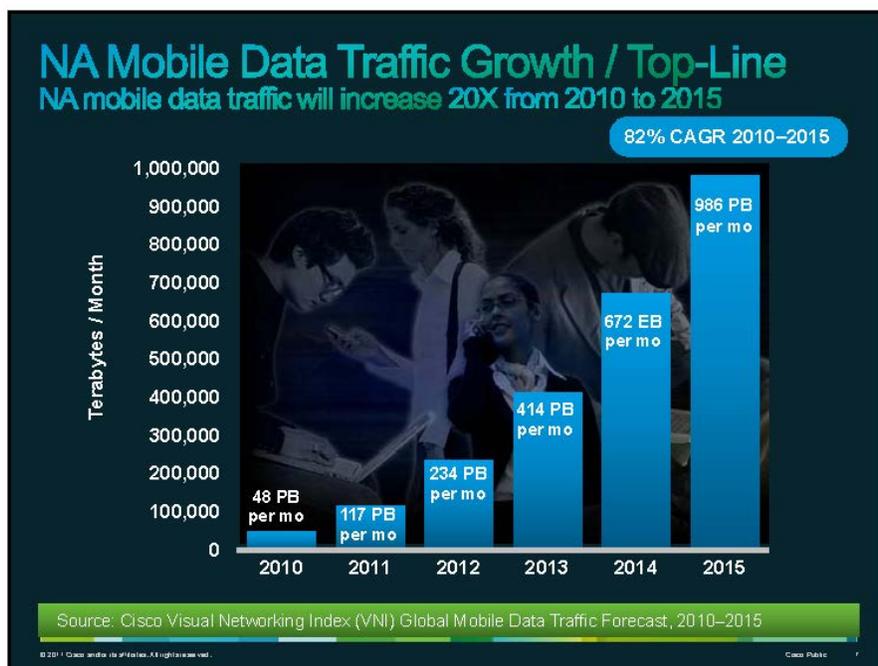
<sup>31</sup> US WIRELESS DATA MARKET – Q4 2010 AND 2010 UPDATE at 3.

<sup>32</sup> U.S. MOBILE CONSUMER SERVICES 2011-2015 FORECAST at 4, 9.

<sup>33</sup> *Id.* at 9.

<sup>34</sup> CTIA 2010 WIRELESS INDUSTRY INDICES at 218.

<sup>35</sup> See US WIRELESS DATA MARKET – Q4 2010 AND 2010 UPDATE at 3.



Source: Cisco<sup>36</sup>

Of course, developments in devices and compelling content have spurred the data surge – and mobile video and web browsing are a large part of the growth of data traffic.<sup>37</sup> One report estimates that approximately 10 percent of mobile users watch video content and consume 38 percent of the data volume on mobile networks.<sup>38</sup> By the end of 2011, it is anticipated that video will jump to 60 percent of the data volume on mobile networks.<sup>39</sup>

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<sup>36</sup> See ROBERT PEPPER, CISCO, WIRELESS ULTRA-BROADBAND IN A ZETTABYTE WORLD 4 (Oct. 2011), [https://www4.gsb.columbia.edu/null/download?&exclusive=filemgr.download&file\\_id=7219528](https://www4.gsb.columbia.edu/null/download?&exclusive=filemgr.download&file_id=7219528).

<sup>37</sup> See *id.* at 3.

<sup>38</sup> See MICHAEL KLEEMAN, GLOBAL INFORMATION INDUSTRY CENTER, UNIVERSITY OF CALIFORNIA SAN DIEGO, POINT OF VIEW: WIRELESS POINT OF DISCONNECT 4 (Oct. 2011) (“WIRELESS POINT OF DISCONNECT”). Streaming a YouTube video on a smartphone is roughly equivalent to 500,000 text messages. See PARKS ASSOCIATES, INDUSTRY REPORT: MOBILE BROADBAND & MOBILE COMPUTING DEVICES 22 (Feb. 2011) (“MOBILE BROADBAND & MOBILE COMPUTING DEVICES”).

<sup>39</sup> See WIRELESS POINT OF DISCONNECT at 4.

Vigorous competition continues to place downward pricing pressure on operators, who have responded with a wide variety of pricing plans and service options.<sup>40</sup> For example, Sprint Nextel continues to offer unlimited data plans for smartphone users and tiered plans for connected devices.<sup>41</sup> Other operators have transitioned from unlimited data plans to tiered data plans at price points that allow consumers to tailor their plans to their individual needs.<sup>42</sup> As one analyst explained, “[a]s consumption increases, U.S. wireless operators have responded by competing for customers on price, both by offering more data for the same money, or by lowering prices for fixed amounts of data.”<sup>43</sup> AT&T, Verizon Wireless and T-Mobile have various tiered data pricing structures.<sup>44</sup> MetroPCS offers unlimited web for all of its smartphones, with tiered pricing for fixed and unlimited access to full data (streaming and

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<sup>40</sup> See SAROOP PUREWAL ET AL., MORGAN STANLEY RESEARCH GLOBAL, TELECOMMUNICATIONS SERVICES, GLOBAL MOBILE: HOW DATA SHIFTS MARKET SHARES OR PROMOTES CONSOLIDATION 37 (Sep. 13, 2011) (describing various data plans offered by U.S. operators); SARA KAUFMAN, ANALYST, OVUM, GLOBAL MOBILE MARKET OUTLOOK: 2011-16, 14 (Sep. 2011) (The phasing out of unlimited plans has supported the “rapid expansion of choice in data tariffs, prepaid tariffs, and mobile Internet devices, particularly smartphones.”).

<sup>41</sup> Sprint, Plans, [http://shop.sprint.com/mysprint/shop/plan/plan\\_wall.jsp?tabId=pt\\_individual\\_tab&flow=AAL&planFamilyType=nu](http://shop.sprint.com/mysprint/shop/plan/plan_wall.jsp?tabId=pt_individual_tab&flow=AAL&planFamilyType=nu) (last visited Dec. 1, 2011).

<sup>42</sup> U.S. MOBILE CONSUMER SERVICES 2011-2015 FORECAST at 4. Almost all other nations with a recognizable smartphone penetration rate have adopted tiered pricing structure. See CHETAN SHARMA, CHETAN SHARMA CONSULTING, US MOBILE MESSAGING MARKET – GROWTH AND OPPORTUNITIES 11 (Jan. 2011) (“US MOBILE MESSAGING MARKET – GROWTH AND OPPORTUNITIES”); see also NEW DATA PRICING MODELS at 1 (noting that tiered data caps are practical as they help solve the capacity issue); MOBILE BROADBAND & MOBILE COMPUTING DEVICES at 26-27 (describing the pricing and policies of various U.S. operators).

<sup>43</sup> *Price of a Megabyte of Wireless Data.*

<sup>44</sup> See, e.g., Verizon Wireless, Nationwide Single-Line Plans, <http://www.verizonwireless.com/b2c/plans/?page=single> (last visited Dec. 1, 2011); Verizon Wireless, Mobile Broadband Plans Details, <http://www.verizonwireless.com/b2c/plans/?page=mobileBroadband> (last visited Dec. 1, 2011); AT&T, Wireless, Data & Internet, <http://www.wireless.att.com/cell-phone-service/services/services-list.jsp?catId=cat2510038&catName=Data+%26+Internet> (last visited Dec. 1, 2011); T-Mobile, Shop Plans, Individual, <http://www.t-mobile.com/shop/plans/individual-plans.aspx> (last visited Dec. 1, 2011); T-Mobile, Shop Plans, Mobile Broadband Plans, <http://www.t-mobile.com/shop/plans/mobile-broadband-plans.aspx> (last visited Dec. 1, 2011).

video).<sup>45</sup> Leap follows a tiered data pricing structure for its smartphones and connected devices.<sup>46</sup> C Spire Wireless (formerly Cellular South) offers unlimited web (with limited streaming video), email and messaging, and subscribers can purchase unlimited video streaming for an additional fee.<sup>47</sup> Typically, the more capacity a consumer purchases under these tiered plans, the greater savings the consumer receives on a per megabyte basis.<sup>48</sup>

Operators also use limited-time promotions to provide increasing savings to consumers. For example, a current Verizon Wireless nationwide offer allows consumers to double their monthly data allowance with the purchase of a new 4G LTE smartphone.<sup>49</sup> Similarly, a T-Mobile promotion includes 2 gigabytes of high-speed data for \$10 per month<sup>50</sup> and MetroPCS offers unlimited free music on Rhapsody® for 90 days.<sup>51</sup>

Consequently, even as underlying service offerings have improved, “[m]obile broadband pricing has decreased and will continue to decrease, allowing more consumers the opportunity to experiment with the service.”<sup>52</sup> In fact, the price per megabyte of service plummeted nearly 90

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<sup>45</sup> MetroPCS, MetroPCS Flat-rate Cell Phone Plans, <http://www.metropcs.com/plans/default.aspx?tab=smartphones> (last visited Dec. 1, 2011).

<sup>46</sup> Cricket, Data Plans, <http://www.mycricket.com/broadband/plans> (last visited Dec. 1, 2011).

<sup>47</sup> C Spire Wireless, Why CHOICE Plans?, [http://www.cspire.com/shop\\_and\\_learn/plans/category\\_plan\\_landing.jsp?id=cat320003](http://www.cspire.com/shop_and_learn/plans/category_plan_landing.jsp?id=cat320003) (last visited Dec. 1, 2011).

<sup>48</sup> For example, 2 gigabytes of data on a smartphone would cost a Verizon Wireless subscriber \$30 per month (*i.e.*, \$15 per gigabyte), while 12 gigabytes of data would cost \$100 (*i.e.*, a little over \$8 per gigabyte). Verizon Wireless, Nationwide Single-Line Plans, <http://www.verizonwireless.com/b2c/plans/?page=single> (last visited Dec. 1, 2011).

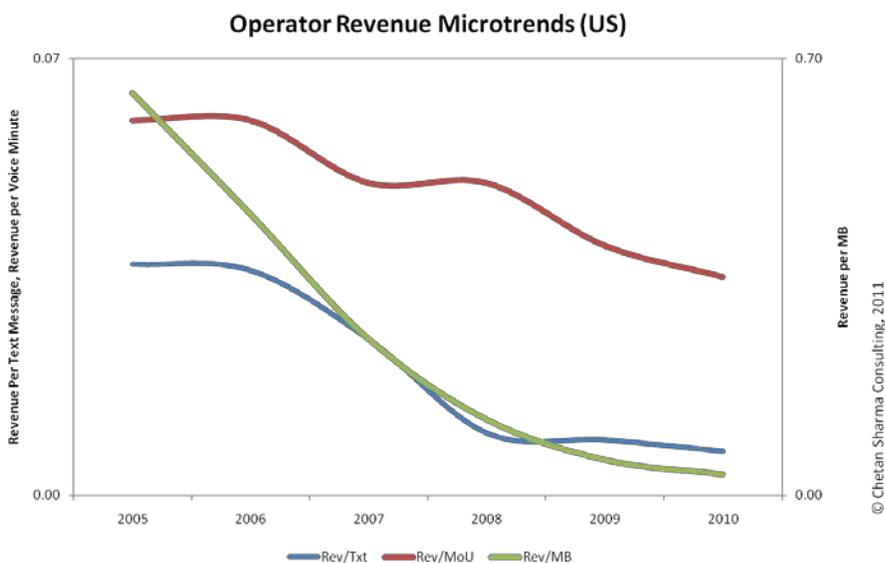
<sup>49</sup> Verizon Wireless, Twice the Data. Same Low Price., <http://shop.verizonwireless.com/?id=Double%20Data> (last visited Dec. 1, 2011).

<sup>50</sup> T-Mobile, Unlimited Data Only \$10/Month, <http://deals.t-mobile.com/unlimited-family-plans#data-plan> (last visited Dec. 1, 2011).

<sup>51</sup> MetroPCS, Rhapsody Unlimited Music Free for Up to 90 Days, <http://www.metropcs.com/rhapsody-free-trial/> (last visited Dec. 5, 2011).

<sup>52</sup> AMY LIND ET AL., IDC, U.S. CONSUMER FIXED BROADBAND DISPLACEMENT BY MOBILE BROADBAND 2011-2015 FORECAST: READY, SET... WAIT? 14 (June 2011) (“U.S. CONSUMER FIXED BROADBAND DISPLACEMENT”).

percent from 2008-2010, from 47 cents to approximately 5 cents per megabyte.<sup>53</sup> As one analyst noted, “[t]oday the effective price of a megabyte of data is the same as a voice minute, something that was unthinkable ten, or even five, years ago. With the consumption of data continuing to explode due to the tremendous offerings from smartphones, and the investments in 4G networks and backhaul, the price per megabyte of data will continue to decline.”<sup>54</sup>



Source: Chetan Sharma<sup>55</sup>

**b. Expanding Low-Cost Prepaid Offerings Provide Consumers Increased Choices**

The prepaid market continues to expand and drive prices down, as providers “aggressively battle for share.”<sup>56</sup> Prepaid services are most appealing to “price-conscious

<sup>53</sup> *Price of a Megabyte of Wireless Data.*

<sup>54</sup> *Id.*

<sup>55</sup> See COMPETITION AND THE EVOLUTION OF MOBILE MARKETS at 32.

<sup>56</sup> SIMON FLANNERY ET AL., MORGAN STANLEY RESEARCH NORTH AMERICA, TELECOM SERVICES: ALPHAWISE SURVEY POINTS TO ONGOING POSTPAID CANNIBALIZATION BY PREPAID 4 (Sep. 23, 2011) (“MORGAN STANLEY ALPHAWISE SURVEY”). The FCC defines prepaid service as “requir[ing] customers to pay for service prior to making calls.” *Fifteenth Report*, 26 FCC Rcd at 9729 ¶ 94. Postpaid service, by contrast, is where “mobile wireless subscribers pay their phone bills after they have incurred charges, which requires service providers to extend credit to their customers.” *Id.*

consumers,”<sup>57</sup> who are attracted by the “[a]ggressive pricing”<sup>58</sup> and flexibility of prepaid offerings. These features are attracting postpaid subscribers, who are shifting to prepaid plans and driving growth in this segment. Moreover, “[g]iven potential prepaid share gains going forward,” largely postpaid providers are expanding their prepaid offerings.<sup>59</sup> The result is an increasingly diverse, innovative, and intensely competitive low-cost market.

As of mid-2011, wireless prepaid subscriptions exceeded 68 million – up nearly 14 percent from June 2010.<sup>60</sup> Indeed, over the last four years, prepaid subscriptions have increased from 15.2 to 21.2 percent of all wireless subscriptions.<sup>61</sup> Much of this gain has come from postpaid subscribers switching to a prepaid offering. Indeed, 38 percent of current prepaid subscribers have switched from postpaid, and one-third of those did so in the last year.<sup>62</sup> The rise in prepaid customers is expected to steadily continue, reaching a 30 percent market share by 2018.<sup>63</sup>

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<sup>57</sup> See U.S. CONSUMER FIXED BROADBAND DISPLACEMENT at 5.

<sup>58</sup> MORGAN STANLEY ALPHAWISE SURVEY at 9.

<sup>59</sup> *Id.*

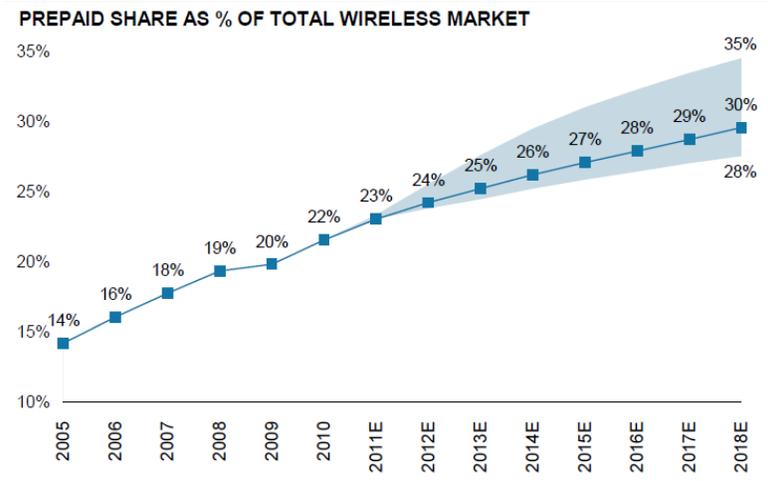
<sup>60</sup> ROBERT F. ROCHE & LIZ DALE, CTIA, PREPAID WIRELESS SERVICE IN THE UNITED STATES 3-4, tbl.1 (Nov. 2011) (providing mid-year 2011 results) (“CTIA’S PREPAID WIRELESS SERVICE REPORT”).

<sup>61</sup> *Id.* at 5-6, tbl.3.

<sup>62</sup> MORGAN STANLEY ALPHAWISE SURVEY at 7, 16.

<sup>63</sup> *Id.* at 5.

## Expect Prepaid Share to Reach 30% by 2018



Source: Company data, Morgan Stanley Research

Source: Morgan Stanley Research<sup>64</sup>

A recent Morgan Stanley AlphaWise survey identified lower monthly costs as the primary reason for switching from postpaid (57 percent of respondents), followed by better value (38 percent) and aversion to a term contract (34 percent).<sup>65</sup> Thus, “[e]conomic pressures underscore [the] majority of the postpaid switching to prepaid.”<sup>66</sup> Taking into account the economic downturn and higher unemployment, “it’s no surprise that prepaid subscribers have grown in market share (as a percentage of the U.S. overall wireless base) during each of the last two years.”<sup>67</sup>

According to the AlphaWise survey, Virgin Mobile (Sprint Nextel) has taken “the lead in taking share of these switchers” from postpaid services to prepaid.<sup>68</sup> The survey results indicate

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<sup>64</sup> *Id.* at 6.

<sup>65</sup> *Id.* at 7.

<sup>66</sup> *Id.* at 8.

<sup>67</sup> IMARI LOVE, MORNINGSTAR, PCS CONTINUES TO MAKE PROGRESS BUT NETWORK ISSUES AND COMPETITION ENSURE IT WILL BE A BUMPY ROAD 1 (Nov. 4, 2011).

<sup>68</sup> MORGAN STANLEY ALPHAWISE SURVEY at 5.

that “Sprint has led the Big 4 in minimizing the impact from postpaid switching.”<sup>69</sup> Verizon Wireless and AT&T have responded with several new competitive prepaid offerings. For example, AT&T announced a new \$25 per month GoPhone plan, including 250 nationwide voice minutes and unlimited, nationwide messaging every 30 days.<sup>70</sup> AT&T also offers an unlimited talk, text, and web nationwide GoPhone plan for \$50 per month.<sup>71</sup> This fall Verizon Wireless launched the “Unleashed” plan, offering unlimited talk, text and web use for \$50 per month.<sup>72</sup>

The result is a highly competitive segment of the market that features a wide variety of carriers – facilities-based and MVNO, national and regional, niche-targeted and mass market. As the following chart shows, TracFone and Sprint Nextel (including Virgin Mobile, Boost and Assurance brands) have the largest prepaid subscriber market shares, followed by MetroPCS:

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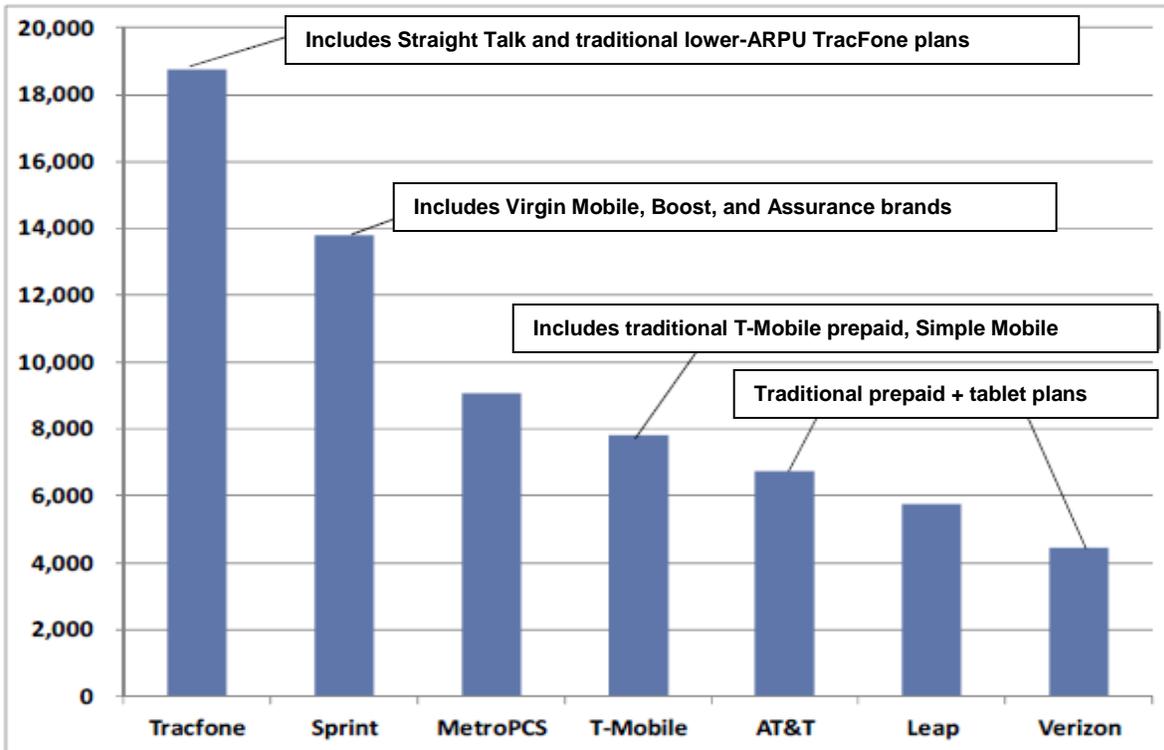
<sup>69</sup> *Id.* at 19.

<sup>70</sup> Press Release, AT&T, Prepaid Calling Never Looked So Good: New \$25 Monthly GoPhone Plan (Sep. 12, 2011), <http://www.att.com/gen/press-room?pid=20597&cdvn=news&newsarticleid=32366&mapcode=consumer%7Cmk-att-gophone>.

<sup>71</sup> Press Release, AT&T, Prepaid Calling Just Got Better: Nationwide Unlimited Talk, Text & Web Plan Now Available for \$50 (June 21, 2011), <http://www.att.com/gen/press-room?pid=20109&cdvn=news&newsarticleid=32055&mapcode=mk-att-gophone%7Cmk-att-text-messaging>.

<sup>72</sup> See Phil Goldstein, *Verizon to launch Unleashed \$50 unlimited prepaid plan nationwide Thursday*, FIERCEWIRELESS, Sep. 13, 2011, <http://www.fiercewireless.com/story/verizon-launch-unleashed-50-unlimited-prepaid-plan-nationwide-thursday/2011-09-13>.

**Exhibit 24: The US prepaid industry remains relatively fragmented, with multiple players, some of which also operate additional sub-brands**  
 Prepaid subscribers by operator, 000s



Source: Compiled by Goldman Sachs Research.

Source: Goldman Sachs Research<sup>73</sup>

Morgan Stanley forecasts that “TracFone ... and MetroPCS will remain as industry leaders within the pure-play prepaid carriers, but overall, Sprint should remain dominant within the space while AT&T and Verizon will gain traction.”<sup>74</sup>

Looking forward, a number of analysts expect continued share shifts from postpaid to prepaid and further price cuts. Morgan Stanley predicts that “[e]conomic headwinds may drive postpaid switching as consumers focus on more value oriented offerings,” and “[v]ery limited

<sup>73</sup> JASON ARMSTRONG ET AL., GOLDMAN SACHS INVESTMENT RESEARCH, COMMUNACOPIA PREVIEW FOR WIRELESS – DOJ/MACRO TAKE CENTER STAGE 19 (Sep. 8, 2011) (“COMMUNACOPIA PREVIEW FOR WIRELESS”).

<sup>74</sup> MORGAN STANLEY ALPHAWISE SURVEY at 6.

room for subscriber growth may drive prepaid carriers to price more aggressively.”<sup>75</sup> Recent prepaid offerings<sup>76</sup> are consistent with these predictions, and demonstrate that providers continue to innovate in the space and offer consumers better value:

- Republic Wireless, which relies on WiFi “whenever possible” in its “Hybrid Calling” system, launched a beta service with a \$19 a month plan for unlimited text, data, and voice.<sup>77</sup>
- Walmart and T-Mobile announced the offering of unlimited web (with the first 5 GB at up to 4G speeds), unlimited text, and 100 minutes of talk for \$30 per month, sold exclusively through Walmart stores and online via the Walmart and T-Mobile USA websites.<sup>78</sup>
- C Spire launched the following “Flex CHOICE” prepaid plans: unlimited messaging and calls for \$2 per day or \$50 per month; and unlimited data and messaging, with 500 minutes for \$50 per month, 1000 minutes for \$60 per month, or unlimited for \$70 per month.<sup>79</sup>
- Leap launched plans with unlimited text, picture, and video messaging, unlimited 3G web, and 300 and 1000 voice minutes, for \$25 and \$35 per month, respectively.<sup>80</sup> It also launched Muve Music plans with additional features such as unlimited song and ringtone downloads for \$45 per month for feature phones and \$55 per month for smartphones.<sup>81</sup>

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<sup>75</sup> *Id.* at 9, 13; *see also* COMMUNACOPIA PREVIEW FOR WIRELESS at 17.

<sup>76</sup> The prepaid examples that follow are consistent with the FCC’s definition of prepaid service, *see supra* n.56, and require payment in advance of use. Examples of recent postpaid service offerings are found in the following section.

<sup>77</sup> Press Release, republic wireless<sup>TM</sup>, republic wireless Reinvents Wireless with Hybrid Calling (Nov. 8, 2011), <http://www.fiercemobilecontent.com/press-releases/republic-wireless-reinvents-wireless-hybrid-calling>. Hybrid calling enables smartphones to use unlimited service through WiFi where available, and uses the cellular network where the customer does not have access to WiFi service. *Id.* Customers must pay \$199 for an initial start up fee for membership and are subject to “the community’s fair use policy,” *i.e.*, each member must establish at least one WiFi connection and is expected to limit his or her use on the cellular network. *Id.*

<sup>78</sup> Press Release, T-Mobile USA, Walmart and T-Mobile Introduce Exclusive No-Annual Contract 4G Offering (Oct. 3, 2011), <http://newsroom.t-mobile.com/articles/walmart-and-t-mobile-introduce-exclusive-no-annual-contract-4g-offering>.

<sup>79</sup> *See generally* C Spire Wireless, Plans, [http://www.cspire.com/shop\\_and\\_learn/plans](http://www.cspire.com/shop_and_learn/plans) (last visited Dec. 5, 2011).

<sup>80</sup> Press Release, Leap Wireless, Cricket to Introduce Unique New Nationwide Cricket Products Into Best Buy and Best Buy Mobile Locations Nationwide (Sep. 22, 2011), <http://leapwireless.mediaroom.com/index.php?s=13383&item=64897>.

<sup>81</sup> *Id.*

- T-Mobile announced unlimited no-contract Monthly4G plans, starting at \$50 per month for unlimited talk, unlimited text, and unlimited Web with the first 100 MB of data at up to 4G speeds, and \$70 per month for unlimited talk, unlimited text, and unlimited Web with the first 5 GB of data at up to 4G speeds.<sup>82</sup> T-Mobile also announced three new Pay by the Day plans: \$3 per day for unlimited talk, text and Web, with the first 200 MB of data at 4G speeds; \$2 per day for unlimited talk, text, and Web at 2G speeds; and \$1 per day for unlimited text and 10 cents per minute for voice.<sup>83</sup>
- MetroPCS announced new unlimited, talk, text, and web browsing (with unlimited YouTube access) 4G LTE plans starting at \$40.<sup>84</sup> For \$50 a month, customers can get additional features including international and premium text messaging, turn-by-turn navigation with MetroNAVIGATOR™, mobile instant messaging, corporate e-mail, and 1 GB of additional data access, and for \$60 a month, customers can get the same services available under the \$50 plan plus unlimited data access and MetroSTUDIO premium content such as video-on-demand channels and audio downloads.<sup>85</sup>
- Assurance Wireless, a Virgin Mobile service which provides a free cell phone and service to eligible low-income customers, announced two new low-cost plans: \$5 a month for 500 minutes; and \$20 a month for 1,000 minutes and 1,000 text messages.<sup>86</sup>
- In October 2010, Virgin Mobile announced a \$30 per month plan tailored to meet the needs of voice-centric customers, providing customers with 1,500 minutes, 500 messages, and 10 MB of web access.<sup>87</sup> In July 2011, Virgin Mobile increased the allotment of messages from 500 to 1,500 per month and the Web access allotment from 10 MB to 30 MB per month without increasing the cost of the plan.<sup>88</sup> Virgin

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<sup>82</sup> Press Release, T-Mobile USA, T-Mobile Offers Monthly 4G Plans Featuring Unlimited Talk, Text and Web With No Annual Contract (May 23, 2011), <http://newsroom.t-mobile.com/articles/t-mobile-offers-monthly4g-plans>.

<sup>83</sup> Press Release, T-Mobile USA, STATEMENT: T-Mobile Adds New Plans To Monthly4G Lineup (Oct. 17, 2011), <http://newsroom.t-mobile.com/articles/t-mobile-adds-new-monthly4g-plans>.

<sup>84</sup> Press Release, MetroPCS, MetroPCS' New 4G LTE Plans Offer Unprecedented Value and Choice With Prices Starting at Just \$40 (Jan. 3, 2011), <http://investor.metropcs.com/phoenix.zhtml?c=177745&p=irol-newsArticle&ID=1511941&highlight=>.

<sup>85</sup> *Id.*

<sup>86</sup> Press Release, Assurance Wireless, Assurance Wireless Introduces Two New Low-Cost Offers (Oct. 25, 2010), [http://assurancewireless.marketwire.com/easyir/prssrel.do?easyirid=B08AA687D2944E36&version=live&releasejs\\_p=release\\_169&prid=705297](http://assurancewireless.marketwire.com/easyir/prssrel.do?easyirid=B08AA687D2944E36&version=live&releasejs_p=release_169&prid=705297).

<sup>87</sup> Press Release, Virgin Mobile, payLo™ by Virgin Mobile Adds \$30 1,500-Minute Plan to Simple and Straight-Forward Pay-As-You-Go Portfolio (Oct. 21, 2010), <http://www.thestreet.com/story/10895232/1/paylo8482-by-virgin-mobile-adds-30-1500-minute-plan-to-simple-and-straight-forward-pay-as-you-go-portfolio.html>.

<sup>88</sup> Press Release, Virgin Mobile, payLo™ by Virgin Mobile Increases Value for Talk 'n' Texters by Adding More Messaging and Data to \$30 Monthly Plan (July 19, 2011), [http://newsroom.sprint.com/article\\_display.cfm?article\\_id=1979](http://newsroom.sprint.com/article_display.cfm?article_id=1979).

Mobile also lowered the monthly price of its Beyond Talk unlimited data, text, and voice plan to \$55.<sup>89</sup>

- Boost Mobile announced the introduction of “Monthly Unlimited with Shrinkage” no-contract wireless service with unlimited nationwide talk, text, web, e-mail, IM, and calls to 411 which starts at \$50 per month and “shrinks” \$5 each successive month bottoming out at \$35 per month.<sup>90</sup>

**c. Carriers Remain Highly Competitive on Postpaid Pricing, Even Though Subscriber Additions Are Slowing**

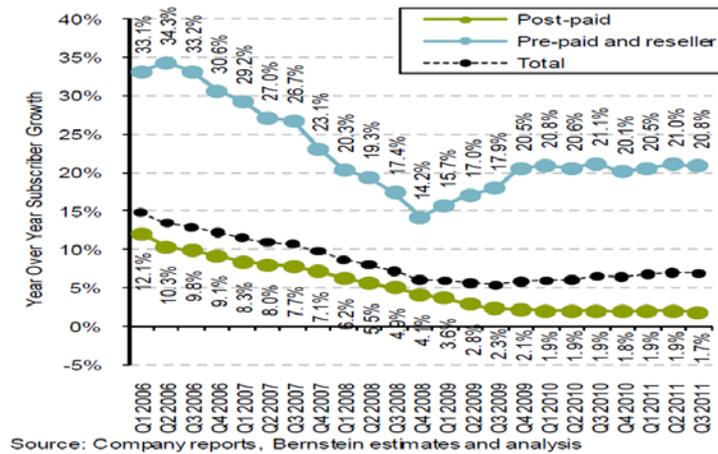
Price reductions are not limited to the prepaid sector; carriers are reducing rates for their postpaid service packages as well. Even as many customers migrate to prepaid service offerings, carriers remain highly competitive on postpaid pricing as well. The following chart depicts wireless subscriber growth over time, and shows how postpaid growth has slowed to 1.7 percent annually:

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<sup>89</sup> Press Release, Virgin Mobile, Virgin Mobile New Beyond Talk Plans Offer Unlimited Data Plan with No Contract (July 13, 2011), [http://newsroom.sprint.com/article\\_display.cfm?article\\_id=1970](http://newsroom.sprint.com/article_display.cfm?article_id=1970).

<sup>90</sup> Press Release, Boost Mobile, Boost Mobile Brings Consumers Another Wireless First with the Launch of Monthly Unlimited with Shrinkage (Oct. 14, 2010), <http://eon.businesswire.com/news/eon/20101014005251/en/Boost-Mobile/prepaid-cell-phone/Monthly-Unlimited>.

### Wireless Market Subscriber Growth



Source: Bernstein Research<sup>91</sup>

Despite maturing of postpaid subscriber growth, the market continues to diversify and carriers continue to compete on price and service offerings through the introduction of new postpaid products. For example:

- C Spire announced a number of postpaid plans: unlimited messaging, with 250 minutes for \$25 per month, 500 minutes for \$40 per month, or unlimited calls for \$50 per month; unlimited data and messaging, with 500 minutes for \$50 per month, 1000 minutes for \$60 per month, or unlimited calls for \$70 per month; and unlimited streaming, data and messaging, with 500 minutes for \$80 per month, 1000 minutes for \$90 per month, or unlimited calls for \$100 per month.<sup>92</sup> C Spire also offers family plans with unlimited messaging, with 1000 minutes for \$80 per month or 2000 minutes for \$100 per month; and unlimited data and messaging, with 1000 minutes for \$100 per month or 2000 minutes for \$120 per month.<sup>93</sup>
- In April 2011, T-Mobile announced a new unlimited data, calling, and texting plan for \$79.99 per month.<sup>94</sup> Three months later, T-Mobile unveiled new Value plans, offering single-line and multiline options with a range of price points for talk, unlimited text, and unlimited data with 2 GB, 5 GB, or 10 GB of high-speed data with

<sup>91</sup> CRAIG MOFFETT ET AL., BERNSTEIN RESEARCH, U.S. WIRELESS: BANDWIDTH ARBITRAGE – HOW BIG A RISK? 14 (Nov. 15, 2011) (“BANDWIDTH ARBITRAGE”).

<sup>92</sup> See generally C Spire Wireless, Plans, [http://www.cspire.com/shop\\_and\\_learn/plans](http://www.cspire.com/shop_and_learn/plans) (last visited Dec. 1, 2011).

<sup>93</sup> *Id.*

<sup>94</sup> Press Release, T-Mobile USA, T-Mobile Introduces New Unlimited Data, Calling and Texting Plan for Only \$79.99 Per Month (Apr. 13, 2011), <http://newsroom.t-mobile.com/articles/79-99-unlimited-plan>.

no data overage charges.<sup>95</sup> T-Mobile also offers the new Value family plan with unlimited talk, unlimited text, and unlimited data with 2 GB of high-speed data for \$49.99 per line.<sup>96</sup>

- AT&T announced unlimited calling to any mobile number available on any network, available to new and existing AT&T customers with a qualifying voice plan who subscribe to unlimited messaging plans.<sup>97</sup>
- U.S. Cellular launched The Belief Project which, among other things, provides that customers who fulfill an initial two-year commitment never have to sign a contract again but still can enjoy the same benefits, such as a new phone at promotional prices every 18 months that can be accelerated with points.<sup>98</sup> The points are rewarded based on a customer's monthly service plan, the number of lines on the account, and how long he or she has been a customer. The new Belief plans start at \$39.99 a month for 450 minutes and a la carte text messages, and go up to \$179.99 a month for a premium family plan that bundles unlimited voice, unlimited texting, and 5 GB of data per line.<sup>99</sup>
- Walmart entered the postpaid space and announced Walmart Family Mobile™ powered by T-Mobile, with service offerings starting at \$45 per month for unlimited talk and text, with each additional line \$25 per month.<sup>100</sup>

#### **d. Messaging Use Continues to Rise While Prices Plummet**

Messaging services – text messaging (“SMS”) and multimedia messaging (“MMS”) – continue to grow dramatically. In fact, the United States is the global leader in terms of total

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<sup>95</sup> Press Release, T-Mobile USA, T-Mobile Unveils Affordable And Worry-Free Unlimited Data Plans (July 20, 2011), <http://newsroom.t-mobile.com/articles/t-mobile-unveils-unlimited-data-plans>.

<sup>96</sup> *Id.*

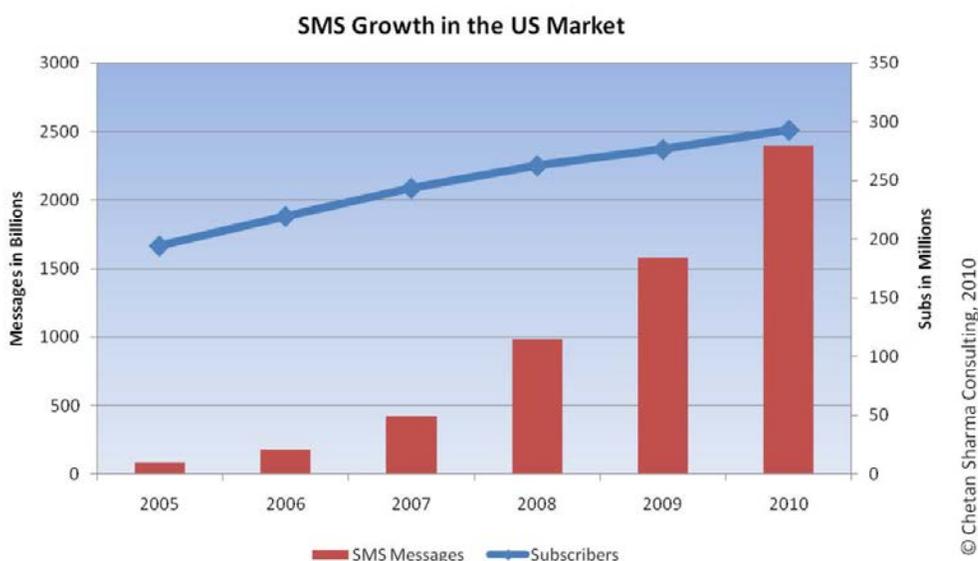
<sup>97</sup> Press Release, AT&T, AT&T Introduces Unlimited Calling to Any Mobile Number (Feb. 9, 2011), <http://www.att.com/gen/press-room?pid=19039&cdvn=news&newsarticleid=31589&mapcode=wireless-networks-generalconsumer>.

<sup>98</sup> Press Release, U.S. Cellular, U.S. Cellular Launches Industry-First Programs That Elevate the Wireless Customer Experience, Reward Loyalty (Sep. 30, 2010), <http://www.uscellular.com/about/press-room/2010/industry-first-programs.html>.

<sup>99</sup> *See generally* U.S. Cellular, Plans, <http://www.uscellular.com/plans/index.html> (last visited Dec. 1, 2011).

<sup>100</sup> Press Release, Walmart, Walmart Introduces Walmart Family Mobile Powered by T-Mobile, Featuring the Lowest Priced Unlimited Talk and Text Wireless Family Plans (Sep. 13, 2010), <http://walmartstores.com/pressroom/news/10297.aspx>.

volume of texts and per subscriber messages per day.<sup>101</sup> Messaging plays a key role not only in communications between individuals, but also in social networking such as Facebook and Twitter, and in business-to-consumer interactions.<sup>102</sup> In 2010 alone, U.S. consumers sent more than 240 trillion messages, more than doubling the volume of messages sent in 2008.<sup>103</sup>



One estimate reports that on a per subscriber basis, the average consumer is interacting with almost 650 messages per month – while younger individuals average more than 3200 messages per month.<sup>104</sup>

Pricing trends for messaging services also have evolved to better meet the needs of consumers. Operators continue to move away from a price-per-message structure in favor of fixed prices for buckets or unlimited texting, allowing consumers to send and receive hundreds

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<sup>101</sup> See US MOBILE MESSAGING MARKET – GROWTH AND OPPORTUNITIES at 3.

<sup>102</sup> *Id.* at 6.

<sup>103</sup> *Id.* at 5; see also CTIA, SEMI-ANNUAL WIRELESS INDUSTRY SURVEY RESULTS 7 (Nov. 11, 2011), <http://www.ctia.org/advocacy/research/index.cfm/AID/10316>.

<sup>104</sup> See US MOBILE MESSAGING MARKET – GROWTH AND OPPORTUNITIES at 6.

and thousands of messages each month.<sup>105</sup> Pricing varies by operator and service plan, but messaging options available in the market include, but are not limited to: pay-as-you-go (*e.g.*, \$0.20 per text message and \$0.25 per picture or video message); buckets (*e.g.*, \$5 for 300 messages or \$10 for 1000 messages); and unlimited messaging bundled with voice and/or data plans or offered for flat fees (*e.g.*, \$20 or \$30 flat fees).

As discussed above, between 2005 and 2010 the price per message declined from 5.7 cents to 0.9 cents.<sup>106</sup> Although the largest price reduction per message occurred between 2005 and 2008 (when bucket texting plans were first introduced), prices continue to drop.<sup>107</sup> From the end of 2008 to the end of 2010, the price per message plummeted about 33 percent from 1.4 cents to 0.9 cents.<sup>108</sup>

**e. Operators Continue to Offer Varied Service Bundles, Which Increases Competitive Pressure on Rival Providers**

Operators continue to explore ways to differentiate themselves by “bundling” services together. Bundled services can offer consumers several benefits, including lower prices, convenient billing, and unique products. The ability to differentiate and attract new consumers and retain existing subscribers via bundled offerings can provide operators with an advantage over competitors.<sup>109</sup>

Most wireless operators offer bundles that include mobile voice, data, and messaging services. In addition, some operators build “double” or “triple” plays comprised of fixed voice

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<sup>105</sup> *Id.* at 7.

<sup>106</sup> *Price of a Megabyte of Data.*

<sup>107</sup> *Id.*

<sup>108</sup> *Id.*

<sup>109</sup> *See U.S. CONSUMER FIXED BROADBAND DISPLACEMENT* at 9.

and broadband, mobile voice and broadband, and video services. These packages might include only the operator's services or they may involve partnerships with other companies to provide consumers with additional choices. For example, AT&T offers a variety of packages that include television and digital video recording, Internet access, and wireline or wireless voice services.<sup>110</sup> Cincinnati Bell and CenturyLink subscribers can bundle home phone, Internet, digital television, wireless, and home security services together.<sup>111</sup> In addition to these more traditional bundles, however, operators are expanding into other areas, such as applications, content, and other services.<sup>112</sup> As bundled service offerings become more diverse, consumers will continue to benefit through lower rates, a wider range of products and services, and improved service quality.

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As the foregoing discussion demonstrates, wireless pricing competition is intense and should be recognized as a key indicator of the dynamic and highly competitive state of the wireless marketplace.

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<sup>110</sup> AT&T, Bundles, [http://www.att.com/shop/bundles/index.jsp?wtSlotClick=1-0068N7-0-5#fbid=v5XU\\_WFCsve](http://www.att.com/shop/bundles/index.jsp?wtSlotClick=1-0068N7-0-5#fbid=v5XU_WFCsve) (last visited Dec. 1, 2011).

<sup>111</sup> Cincinnati Bell, Bundle & Save, <http://www.cincinnati-bell.com/bundles/> (last visited Dec. 1, 2011); CenturyLink, Bundles, <http://www.centurylink.com/home/bundles/> (last visited Dec. 1, 2011).

<sup>112</sup> For example, Verizon Wireless' VCAST Apps Store provides a wide array of applications for subscribers covering, among other things, music and entertainment, social networking, business, weather, reading, music, and games. Verizon Wireless, Apps, <http://mediastore.verizonwireless.com/onlineContentStore/index.html#displayType=0&displayDriver=522&catID=359764&catName=Apps> (last visited Dec. 1, 2011). Several operators also provide GPS and mapping services. See, e.g., AT&T, AT&T Navigator, <http://www.wireless.att.com/cell-phone-service/services/serviceDetails.jsp?LOSGId=&skuId=sku2890219&catId=cat1830038> (last visited Dec. 1, 2011). Sprint TV allows subscribers access to favored channels and shows on their phones. Sprint Nextel, Services, Sprint TV, [http://shop.sprint.com/mysprint/services\\_solutions/details.jsp?detId=tv&catId=service\\_entertainment&catName=Entertainment&detName=Sprint TV&specialCat=](http://shop.sprint.com/mysprint/services_solutions/details.jsp?detId=tv&catId=service_entertainment&catName=Entertainment&detName=Sprint TV&specialCat=) (last visited Dec. 1, 2011).

## 2. Competition on the Basis of Non-Price Factors Is Robust

While price certainly is a major factor in consumers' choice of service provider, as the *Fifteenth Report* observed, mobile wireless service providers “compete on many other dimensions.”<sup>113</sup> Mobile broadband networks and “the products, services, and applications that rely on them” play a “key role” in mobile wireless competition.<sup>114</sup> Customers select carriers based on their network performance and coverage, customer service, and even the attractiveness of their advertising – and carriers compete vigorously on these grounds. Consistent with the increasingly modular nature of wireless competition, devices, applications, and content drive consumer choice. As set out in Section III below, competition has driven substantial efforts to improve the customer experience along all of these vectors.<sup>115</sup>

### a. Network Performance and Coverage Remain Central Elements of Competition, Driving Further Investment

Customers have long judged carriers on the capabilities and reliability of their service offerings and the geographic scope of their coverage. Study after study indicates that network performance and coverage are critical factors in the consumers' choice of service providers.<sup>116</sup>

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<sup>113</sup> *Fifteenth Report*, 26 FCC Rcd at 9733 ¶ 103.

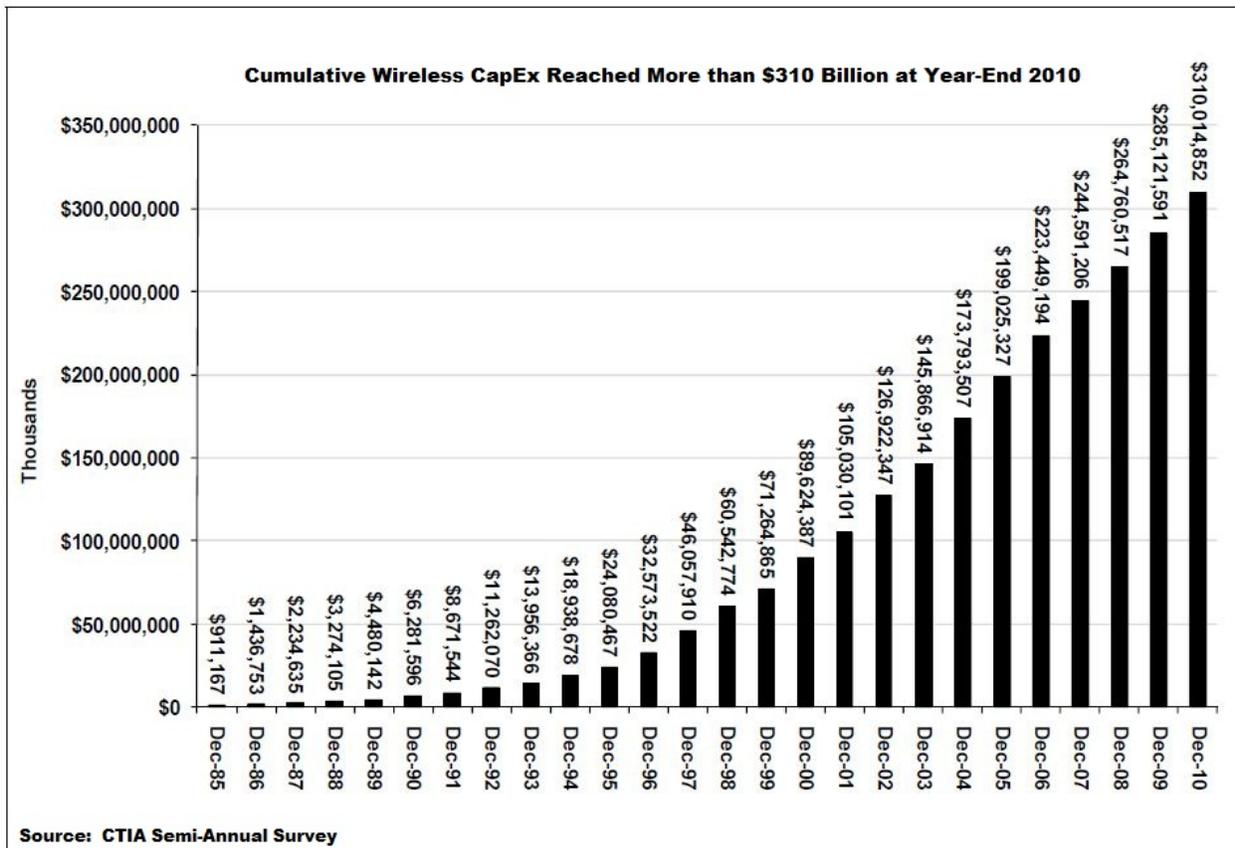
<sup>114</sup> *Id.* at 9733 ¶ 104.

<sup>115</sup> As the Commission has aptly observed, “[s]ervice providers in the mobile telecommunications market also compete on many more dimensions other than price, including non-price characteristics such as coverage, call quality, data speeds, and mobile data content.” 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*, 23 FCC Rcd 2241, 2297 ¶ 124 (2008) (“*Twelfth Report*”).

<sup>116</sup> See, e.g., Press Release, J.D. Power and Associates, J.D. Power and Associates Reports: Overall Wireless Network Problem Rates Differ Considerably Based on Type of Usage Activity (Aug. 25, 2011), <http://www.jdpower.com/news/pressrelease.aspx?ID=2011141> (“[T]here is a financial impact in providing a high-performing network, as spending increases by an average of \$10 per customer among those who have switched from a previous carrier to obtain a better network/coverage, compared with those who leave for other reasons.”); Press Release, American Customer Satisfaction Index, ACSI: Customer Satisfaction Turns Positive Despite Drop for Information Services (May 2011),  
(continued on next page)

One need only review wireless advertising campaigns for confirmation that speed, coverage, and reliability are fertile ground for rivalry. Competition on this vector incents carriers to make enormous investments in the networks that will attract and retain customers.

As the following chart highlights, mobile wireless providers – small, regional, and national – have spent hundreds of billions of dollars in the aggregate to improve and expand their networks to better compete – a total of more than \$310 billion in cumulative capital investment since 1985.<sup>117</sup>



[http://www.theacsi.org/index.php?option=com\\_content&view=article&id=246&Itemid=291](http://www.theacsi.org/index.php?option=com_content&view=article&id=246&Itemid=291) (discussing customer satisfaction with wireless telephone service).

<sup>117</sup> CTIA 2010 WIRELESS INDUSTRY INDICES at 145.

Importantly, despite adverse national economic conditions, competition continues to drive additional incremental investment as mobile wireless providers invested almost \$25 billion in 2010, *increasing* the incremental capital investment by carriers for 2010 *by* 22 percent over 2009.<sup>118</sup> Since 2001, America’s wireless carriers have made an average combined investment of more than \$22.7 billion *per year*.<sup>119</sup> And according to CTIA’s 2011 mid-year survey, mobile wireless providers continue to upgrade their networks with \$12.7 billion invested during the first half of 2011 alone.<sup>120</sup> For example:

**Verizon Wireless.** Verizon Wireless invested more than \$8.4 billion in capital expenditures in 2010 – an 18 percent increase in spending from 2009.<sup>121</sup> As of the third quarter of 2011, Verizon Wireless’s capital expenditures were approximately \$7.2 billion – a 15.8 percent increase from the similar period in 2010.<sup>122</sup> In December 2010, Verizon Wireless launched LTE service in 38 cities and 60 commercial airports, covering more than 110 million people.<sup>123</sup> Verizon Wireless has since expanded LTE coverage to 179 markets covering more

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<sup>118</sup> *Id.* at 137, 139. Capital investment does not take into consideration the expense of acquiring spectrum. *See id.* at 137-38.

<sup>119</sup> *See id.* at 143.

<sup>120</sup> *See* ROBERT F. ROCHE & LIZ DALE, CTIA, CTIA’S WIRELESS INDUSTRY INDICES: MID-YEAR 2011 RESULTS 144 (Nov. 2011) (providing mid-year 2011 results).

<sup>121</sup> *See* Verizon Communications Inc., Annual Report (Form 10-K), Exh. 13 (Feb. 28, 2011) (noting capital expenditures of \$8.438 billion for Verizon Wireless’ domestic wireless operations in 2010); Verizon Wireless, Best Network: Your Signal Is Strong, <http://aboutus.vzw.com/bestnetwork/overview.html> (last visited Dec. 1, 2011) (“Verizon Wireless has invested more than \$65 billion since it was formed – \$6 billion on average every year ....”).

<sup>122</sup> *See* Verizon Communications Inc., Quarterly Report (Form 10-Q), at 37 (Oct. 25, 2011).

<sup>123</sup> *See* Press Release, Verizon Wireless, Verizon Wireless Launches the World’s Largest 4G LTE Wireless Network on Dec. 5 (Dec. 1, 2010), <http://news.vzw.com/news/2010/12/pr2010-11-30a.html>; Press Release, Verizon Wireless, Verizon Wireless Launches 4G LTE in 38 Major Metropolitan Areas by the End of the Year (Oct. 6, 2010), <http://news.verizonwireless.com/news/2010/10/pr2010-10-01c.html>.

than 186 million people as of November 17, 2011.<sup>124</sup> Verizon Wireless plans to cover its entire existing nationwide 3G footprint with 4G LTE by the end of 2013.<sup>125</sup> The network is capable of peak download speeds of 40-50 Mbps and peak upload speeds of 20-25 Mbps with typical data rates of 5-12 Mbps on the downlink and 2-5 Mbps on the uplink.<sup>126</sup>

To help expand LTE coverage in rural areas, Verizon Wireless has initiated the Rural LTE Program, whereby it leases parts of its 700 MHz spectrum to rural carriers who then build out the network and share LTE services in those regions.<sup>127</sup> Verizon Wireless has announced 12 rural carrier partners that are leasing spectrum covering parts of Idaho, Illinois, Indiana, Kentucky, Oklahoma, Michigan, Missouri, North Carolina, West Virginia, Wisconsin, and Utah.<sup>128</sup>

Verizon Wireless also continues to enhance its 3G wireless EV-DO networks (EV-DO Rev. A). For example, in 2010, Verizon Wireless invested more than \$291 million on its network in Ohio, \$221.3 million in Michigan, \$96 million in Kansas, and \$90 million in

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<sup>124</sup> See Press Release, Verizon Wireless, The Nation's Largest 4G LTE Network Comes to 14 New Markets and Expands in Four Markets on Nov. 17 (Nov. 16, 2011), <http://news.verizonwireless.com/news/2011/11/pr2011-11-15f.html>.

<sup>125</sup> See Verizon Wireless, News Center: LTE Information Center, <http://news.verizonwireless.com/LTE/Overview.html> (last visited Dec. 1, 2011).

<sup>126</sup> See Press Release, Verizon Wireless, Verizon Wireless' 4G LTE Network Testing Promises Significantly Faster Speeds Than Current 3G Networks (Mar. 8, 2010), <http://news.verizonwireless.com/news/2010/03/pr2010-03-02b.html>.

<sup>127</sup> See *Pioneer Cellular Joins Verizon's Rural LTE Program*, WORLDTECH24, Dec. 17, 2010, <http://www.worldtech24.com/phones/pioneer-cellular-joins-verizons-rural-lte-program>; Verizon Wireless, LTE in Rural America, <http://aboutus.vzw.com/rural/Overview.html> (last visited Dec. 1, 2011).

<sup>128</sup> See Joan Engbretson, *Verizon Now Has 12 Rural 4G LTE Partners, Appalachian Wireless Latest to Join*, TELECOMPETITOR, Oct. 6, 2011, <http://www.telecompetitor.com/verizon-now-has-12-rural-4g-lte-partners-appalachian-wireless-latest-to-join/>; Bernie Arnason, *Verizon Adds Chariton Valley to Verizon 4G Program*, TELECOMPETITOR, Sep. 9, 2011, <http://www.telecompetitor.com/verizon-adds-chariton-valley-to-verizon-rural-4g-program/>; Bernie Arnason, *Verizon Adds Another Partner to Rural 4G LTE Program*, TELECOMPETITOR, Apr. 20, 2011, <http://www.telecompetitor.com/verizon-adds-another-partner-to-rural-4g-lte-program/>; Lynette Luna, *Verizon Wireless makes rural LTE deal with Carolina West*, FIERCE BROADBAND WIRELESS, Apr. 17, 2011, <http://www.fiercebroadbandwireless.com/story/verizon-wireless-makes-rural-lte-deal-carolina-west/2011-04-17>.

Missouri – to add 129 new cell sites and upgrade equipment on more than 2,100 existing sites.<sup>129</sup> These improvements helped to increase the coverage and capacity of the 3G network. Millions more were spent on similar network upgrades throughout the nation.<sup>130</sup> Verizon Wireless' 3G network now covers about 290 million people.<sup>131</sup>

**AT&T.** AT&T offers 3G services utilizing a different technology – High Speed Packet Access (“HSPA”). AT&T completed the upgrade of nearly all its network to HSPA+ in 2010 covering approximately 300 million people as of December 2010 with network speeds up to 6 Mbps.<sup>132</sup> In early 2011, AT&T announced plans to use the 700 MHz band and AWS-1 spectrum as the foundation for its 4G LTE deployment.<sup>133</sup> AT&T subsequently launched LTE service in September 2011 and now offers service in 15 cities with plans to reach 70 million Americans by

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<sup>129</sup> Press Release, Verizon Wireless, Verizon Wireless Invests \$291 million in Ohio (Feb. 7, 2011), <http://news.verizonwireless.com/news/2011/02/pr2011-02-07d.html>; Press Release, Verizon Wireless, Verizon Wireless Invests \$221.3 Million in 2010 to Enhance Michigan Network (Jan. 24, 2011), <http://news.verizonwireless.com/news/2011/01/pr2011-01-27c.html>; Press Release, Verizon Wireless, Verizon Wireless Invests \$96 Million in Kansas (Feb. 9, 2011), <http://news.verizonwireless.com/news/2011/02/pr2011-02-09d.html>; Press Release, Verizon Wireless, Verizon Wireless Invests \$90 Million in Missouri (Feb. 9, 2011), <http://news.verizonwireless.com/news/2011/02/pr2011-02-09e.html>.

<sup>130</sup> See, e.g., Press Release, Verizon Wireless, Verizon Wireless Invests \$100 Million in Western Pennsylvania (Feb. 7, 2011), <http://news.verizonwireless.com/news/2011/02/pr2011-02-07b.html>; Press Release, Verizon Wireless, Washington Customers Benefit from \$114 Million Verizon Wireless Network Investment in 2010 (Feb. 4, 2011), <http://news.verizonwireless.com/news/2011/02/pr2011-02-04f.html>; Press Release, Verizon Wireless, Arizona Customers Benefit from \$138 Million Verizon Wireless Network Investment in 2010 (Feb. 1, 2011), <http://news.verizonwireless.com/news/2011/02/pr2011-02-01c.html>.

<sup>131</sup> See Verizon Wireless, Best Network, Network Facts, [http://aboutus.vzw.com/bestnetwork/network\\_facts.html](http://aboutus.vzw.com/bestnetwork/network_facts.html) (last visited Dec. 1, 2011).

<sup>132</sup> See Edward Baig, *CES 2011: AT&T Outlines Plans for 4G Network*, USA TODAY, Jan. 5, 2011, <http://content.usatoday.com/communities/technologylive/post/2011/01/ces-2011-at38t-outlines-plans-for-4g-network/1>; James Losey and Chieh-yu Li, *Call it “3G” or “4G,” America’s Wireless Networks Are Still Slow*, ARS TECHNICA, Feb. 14, 2011, <http://arstechnica.com/tech-policy/news/2011/02/the-wireless-generation-gap-america-in-the-slow-lane.ars>.

<sup>133</sup> Joan Marsh, *Getting Real About Spectrum*, AT&T PUBLIC POLICY BLOG, Feb. 1, 2011, <http://attpublicpolicy.com/government-policy/getting-real-about-spectrum/>.

year-end 2011.<sup>134</sup> AT&T plans to largely complete its LTE network build by the end of 2013.<sup>135</sup>

AT&T has also announced plans to launch LTE-Advanced technology with theoretical peak download mobile speeds of at least 100 Mbps by 2013.<sup>136</sup>

*Sprint Nextel.* Sprint Nextel offers 4G WiMAX service under its own brand through its relationship with Clearwire. Sprint Nextel's WiMAX service covered 71 markets by year-end 2010 and now covers 77 markets and 133 million people.<sup>137</sup> Sprint Nextel's 3G EV-DO Rev. A network currently covers more than 274 million people.<sup>138</sup>

In December 2010, Sprint Nextel announced a plan, called Network Vision, to deploy multi-mode technology that will allow consolidation of multiple frequency bands and network technologies into a "seamless network."<sup>139</sup> According to Sprint Nextel, "[t]he multi-mode

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<sup>134</sup> See, e.g., Press Release, AT&T, 4G LTE from AT&T Now Available in Atlanta (Sep. 19, 2011), <http://www.att.com/gen/press-room?pid=21166&cdvn=news&newsarticleid=32814&mapcode=wireless-networks-general/consumer>; Matt Hamblen, *AT&T to Add Six More LTE Cities on Sunday*, COMPUTERWORLD, Nov. 14, 2011, [http://www.computerworld.com/s/article/9221812/AT\\_T\\_to\\_add\\_six\\_more\\_LTE\\_cities\\_on\\_Sunday](http://www.computerworld.com/s/article/9221812/AT_T_to_add_six_more_LTE_cities_on_Sunday); Press Release, AT&T, 4G LTE from AT&T Available in Charlotte on November 20 (Nov. 14, 2011), <http://www.att.com/gen/press-room?pid=22036&cdvn=news&newsarticleid=33269&mapcode=wireless-networks-general/broadband>.

<sup>135</sup> See Phil Goldstein, *AT&T Names First Five LTE Markets for Summer Launch*, FIERCEWIRELESS, May 25, 2011, <http://www.fiercewireless.com/story/att-names-first-five-lte-markets-summer-launch/2011-05-25>.

<sup>136</sup> See Michelle Maisto, *AT&T Joins Sprint, Clearwire, Ericsson in Scheduling LTE-Advanced for 2013*, CONNECTED PLANET, Nov. 9, 2011, <http://connectedplanetonline.com/mobile-apps/news/AT-T-joins-Sprint-Clearwire-Ericsson-in-scheduling-LTE-Advanced-for-2013-1109/>.

<sup>137</sup> See Sprint Nextel, Annual Report (Form 10-K), at F-41 (Feb. 24, 2011); Clearwire, Coverage Map, <http://www.clear.com/coverage> (last visited Dec. 1, 2011).

<sup>138</sup> See Sprint Nextel, October 2011 Sprint Connection, [http://sprint.m.delivery.net/w/webView?cid=14270332956&mid=1778037043&pid=1063216&vid=1053&ee=bWlrZUB0ZWNoc2VydmljZXM0YWxsLmNvbQ\\_&si=&mv=T&bv=H&oc=N&sc=&k=1f\\_h4p](http://sprint.m.delivery.net/w/webView?cid=14270332956&mid=1778037043&pid=1063216&vid=1053&ee=bWlrZUB0ZWNoc2VydmljZXM0YWxsLmNvbQ_&si=&mv=T&bv=H&oc=N&sc=&k=1f_h4p) (last visited Dec. 1, 2011). The Sprint Nextel 3G network reached over 271 million at the end of 2010. See Rich Pesce, *HTC EVO Shift 4G Is HTC EVO 4G's Little Sibling*, SPRINT NEWS BLOG, Jan. 5, 2011, <http://community.sprint.com/baw/community/sprintblogs/announcements/blog/2011/01/05/htc-evo-shift-4g-is-htc-evo-4g-s-little-sibling>.

<sup>139</sup> Press Release, Sprint Nextel, Sprint Announces Network Vision – A Cutting Edge Network Evolution Plan With Partners Alcatel-Lucent, Ericsson and Samsung (Dec. 6, 2010), [http://newsroom.sprint.com/article\\_display.cfm?article\\_id=1732](http://newsroom.sprint.com/article_display.cfm?article_id=1732).

technology ... utilizes software-based solutions with interchangeable hardware to provide greater network flexibility, which allows for the deployment of 4G long term evolution (4G LTE).”<sup>140</sup>

As of the third quarter of 2011, Sprint Nextel deployed the Network Vision technology to about 22,000 cell sites with expectations for a commercial launch in select markets by mid-year 2012.<sup>141</sup> In October 2011, Sprint Nextel announced plans to launch 4G LTE on its PCS spectrum by mid-2012.<sup>142</sup> Sprint Nextel expects to complete a nationwide rollout of 4G LTE by 2013, covering more than 250 million people.<sup>143</sup>

***T-Mobile.*** In early 2011, T-Mobile announced that it upgraded its 3G HSPA network during 2010 to HSPA+ 21 – with theoretical download speeds of up to 21 Mbps – in 100 major metropolitan areas.<sup>144</sup> T-Mobile has since expanded the reach of HSPA+ 21 to 208 markets, covering more than 200 million people.<sup>145</sup> T-Mobile also unveiled plans to double the speed of its network to HSPA+ 42, capable of delivering peak download speeds of up to 42 Mbps.<sup>146</sup> As of November 2011, T-Mobile had enhanced its network to HSPA+ 42 in 163 markets, covering 180 million people.<sup>147</sup> The upgraded network reportedly has “average download speeds ...

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<sup>140</sup> Sprint Nextel, Quarterly Report (Form 10-Q), at 25 (Nov. 3, 2011).

<sup>141</sup> *Id.*

<sup>142</sup> See Press Release, Sprint Nextel, Sprint Accelerates Deployment of Network Vision and Announces National Rollout of 4G LTE (Oct. 7, 2011), [http://newsroom.sprint.com/article\\_display.cfm?article\\_id=2064](http://newsroom.sprint.com/article_display.cfm?article_id=2064).

<sup>143</sup> *Id.*

<sup>144</sup> See Press Release, T-Mobile, T-Mobile USA CEO and President Philipp Humm Highlights the Company’s Network Leadership and Focus on Fueling Data Adoption (Jan. 6, 2011), <http://newsroom.t-mobile.com/articles/T-Mobile-Humm-Highlights-Network-Leadership-CES>.

<sup>145</sup> See Dan Seifert, *T-Mobile Expands HSPA+ 42 Mbps Coverage to 11 More Markets*, MOBILEBURN, Nov. 16, 2011, <http://www.mobileburn.com/17567/news/t-mobile-expands-hspa-42mbps-coverage-to-11-more-markets>.

<sup>146</sup> See Press Release, T-Mobile, T-Mobile USA CEO and President Philipp Humm Highlights the Company’s Network Leadership and Focus on Fueling Data Adoption (Jan. 6, 2011), <http://newsroom.t-mobile.com/articles/T-Mobile-Humm-Highlights-Network-Leadership-CES>.

<sup>147</sup> See Dan Seifert, *T-Mobile Expands HSPA+ 42 Mbps Coverage to 11 More Markets*, MOBILEBURN, Nov. 16, 2011, <http://www.mobileburn.com/17567/news/t-mobile-expands-hspa-42mbps-coverage-to-11-more-markets>.

approaching 10 Mbps with peak speeds of 27 Mbps, and download speeds approaching 8 Mbps with peak speeds of 20 Mbps on [T-Mobile's] most advanced HSPA+ 42 Mbps-capable smartphones."<sup>148</sup>

**Clearwire.** Clearwire increased the number of people covered by its networks by more than 72.4 million in 2010.<sup>149</sup> As of December 31, 2010, Clearwire offered services in 88 markets, covering approximately 114.2 million people, including 112.0 million people through its 4G WiMax mobile broadband network in 71 markets.<sup>150</sup> By the end of the third quarter 2011, Clearwire's networks covered about 135 million people, including 133 million people with its 4G network.<sup>151</sup> Clearwire announced plans in August 2011 to add "LTE Advanced-ready," a time division duplex service technology, to its 4G network.<sup>152</sup>

**Regional Carriers.** Regional carriers remain significant players as they continue to deploy 3G technologies and migrate to 4G technology to improve coverage and compete. MetroPCS became the first carrier to launch LTE service in the U.S. in September 2010 and now offers LTE service in 14 market areas.<sup>153</sup> U.S. Cellular added 366 cell sites in 2010 and 183 sites as of the third quarter of 2011, expanding its 3G network coverage to 98 percent of its

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<sup>148</sup> T-Mobile, 4G Wireless Network Speed and Great Cell Phone Coverage, <http://t-mobile-coverage.t-mobile.com/> (last visited Dec. 1, 2011).

<sup>149</sup> See Sprint Nextel, Annual Report (Form 10-K), at F-41 (Feb. 24, 2011).

<sup>150</sup> *Id.* In 17 markets, Clearwire operates using a pre-4G legacy network technology developed by Motorola. See *id.*; Clearwire Corp., Annual Report (Form 10-K), at 2 (Feb. 22, 2011).

<sup>151</sup> See Press Release, Clearwire, Clearwire Reports Third Quarter 2011 Results (Nov. 2, 2011), <http://corporate.clearwire.com/releasedetail.cfm?ReleaseID=620322>.

<sup>152</sup> See Press Release, Clearwire, Clearwire Announces Intent to Add LTE to Its Network to Accelerate Wholesale Business (Aug. 3, 2011), <http://corporate.clearwire.com/releasedetail.cfm?ReleaseID=596508>.

<sup>153</sup> See Sam Churchill, *MetroPCS: First with LTE in US*, DAILYWIRELESS.ORG, Sep. 21, 2010, <http://www.dailywireless.org/2010/09/21/metropcs-first-with-lte-in-us/>; MetroPCS, 4G Coverage Map, <http://www.metropcs.com/coverage/> (last visited Dec. 1, 2011).

customers.<sup>154</sup> In 2011, U.S. Cellular announced plans to rollout 4G LTE service “to more than 25 percent of its customers across two dozen markets” by year-end and to start offering LTE devices to customers in the first quarter of 2012.<sup>155</sup> Leap Wireless has expanded its 3G EV-DO Rev. A network coverage to nearly 95million people in 2011 and has announced plans to cover 25 million people with LTE by the end of 2012.<sup>156</sup>

***Smaller Companies.*** In addition, smaller companies have rolled out high-speed wireless broadband networks in their various markets around the country and continue to upgrade their networks in 2011. For example, C Spire increased its EV-DO data coverage in 2011 by about 38 percent, or 1.3 million people, giving it a total coverage footprint of 4.7 million POPs.<sup>157</sup> It has also made significant investments to prepare for deploying a 4G LTE network using its 700 MHz spectrum.<sup>158</sup>

Alaska Communications Systems (“ACS”) also has announced plans to deploy the first 4G LTE network in the State of Alaska.<sup>159</sup> ACS will invest \$32 million in the project and will

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<sup>154</sup> See United States Cellular Corp., Annual Report (Form 10-K), at 6, Exh. 13 at 4 (Feb. 25, 2011).

<sup>155</sup> See Press Release, U.S. Cellular, U.S. Cellular to Launch 4G LTE Service and Devices in Time for the Holidays (May 6, 2011), <http://www.uscellular.com/about/press-room/2011/USCELLULAR-TO-LAUNCH-4G-LTE-SERVICE-AND-DEVICES-IN-TIME-FOR-THE-HOLIDAYS.html>; Press Release, U.S. Cellular, U.S. Cellular Announces Readiness of 4G LTE Network (Nov. 4, 2011), <http://www.uscellular.com/about/press-room/2011/USCELLULAR-ANNOUNCES-READINESS-OF-4G-LTE-NETWORK.html>.

<sup>156</sup> See Leap, Coverage, <http://www.leapwireless.com/brands/nationwide-wireless> (last visited Dec. 1, 2011); Leap Wireless International, Inc., Quarterly Report (Form 10-Q), at 37 (Nov. 3, 2011).

<sup>157</sup> See Phil Goldstein, *C Spire Boosts EV-DO Network Coverage by 1.3M POPs*, FIERCEWIRELESS, Oct. 24, 2011, <http://www.fiercewireless.com/story/c-spire-boosts-ev-do-network-coverage-13m-pops/2011-10-24>.

<sup>158</sup> See Press Release, C Spire Wireless, *Cellular South Changes Name to C Spire Wireless* (Sep. 26, 2011), [http://www.cspire.com/company\\_info/news/news\\_detail.jsp?entryId=9400004](http://www.cspire.com/company_info/news/news_detail.jsp?entryId=9400004); Maisie Ramsay, *C Spire Ramps Expansion for LTE Prep*, CED MAGAZINE, Oct. 24, 2011, <http://www.cedmagazine.com/news/2011/10/c-spire-ramps-expansion-for-lte-prep>.

<sup>159</sup> Press Release, Alaska Communications Systems, Alaska Communications Announces Alaska's First 4G LTE Wireless Network (June 22, 2011), <http://www.alaskacommunications.com/About-ACS/News.aspx>.

rollout 4G LTE in a phased manner throughout its coverage footprint.<sup>160</sup> ACS also continues to expand its 3G EV-DO network in the state, which now covers more than 75 percent of Alaska’s population.<sup>161</sup>

**b. Rival Providers Compete to Provide Meaningful Customer Information and Quality Customer Care**

Customer information and customer care are additional, differentiating elements of carrier competition. Carriers have every incentive to inform and serve their customers – and are in fact doing so – in order to compete and win in the marketplace. The plethora of information from carriers as well as third parties reinforces competition.

*Customer Information.* Mobile wireless carriers offer customers extensive plan-related information in their stores and on their websites, ranging from pricing and usage figures to detailed coverage maps. As CTIA has explained, wireless carriers covering almost 97 percent of consumers in the U.S. have voluntarily adopted CTIA’s “Consumer Code for Wireless Service.”<sup>162</sup> Under the Code, participating carriers are required to give consumers information they need to help them to make informed choices, and to ensure they have information regarding their wireless service plans and coverage maps.<sup>163</sup> The Code covers voice, messaging, and data

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<sup>160</sup> *Id.*

<sup>161</sup> See Press Release, Alaska Communications Systems, Alaska Communications Brings 3G Coverage to Gustavus and Hoonah (July 18, 2011), <http://www.alaskacommunications.com/About-ACS/News.aspx>.

<sup>162</sup> See CTIA, Consumer Code Participants, <http://www.ctia.org/content/index.cfm/AID/10623> (last visited Dec. 1, 2011).

<sup>163</sup> CTIA, CTIA Consumer Code for Wireless Service, at 1-2, [http://files.ctia.org/pdf/The\\_Code.pdf](http://files.ctia.org/pdf/The_Code.pdf) (last visited Dec. 1, 2011) (“CTIA Consumer Code”). In 2004, the largest national carriers, including Verizon Wireless, also agreed to follow certain uniform nationwide consumer protection practices in conducting their businesses. This agreement, known as the Assurance of Voluntary Compliance (“AVC”), also helps to ensure that consumers are provided with information covering advertising, point of sale rate and term disclosures, coverage map information, cancellation and trial periods for phone usage, and customer billing formats.

services for both prepaid and postpaid wireless customers.<sup>164</sup> Mobile providers have also supplied wireless consumers with a variety of tools to monitor their accounts and their service use through their mobile devices, on the Internet, and through text alerts.<sup>165</sup> Following extensive discussions with numerous stakeholders, the Code was recently updated to include a provision requiring wireless carriers to provide postpaid customers who have limited allowances free usage alerts when they approach and exceed their voice, messaging, and data allowances, and to notify customers without an international roaming plan/package whose devices have registered abroad and who may incur charges for international usage. Carriers committed to the Code must provide at least two of these alerts by October 17, 2012, and all of these alerts by April 17, 2013.<sup>166</sup>

Verizon Wireless distinguishes itself by adopting policies that extend beyond the requirements of the CTIA Consumer Code. For example, although the recently added provision in the Code specifies that carriers must provide notifications beginning October 2012, Verizon Wireless already provides its customers with multiple proactive alerts. For smartphone (3G and 4G) users with limited data plans, Verizon Wireless sends users text alerts and/or emails when they reach 50 percent, 75 percent, 90 percent, and 100 percent of their monthly allowance. For

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<sup>164</sup> *Id.*

<sup>165</sup> See Brian Josef, *How to Manage Your Wireless Account Using Your Wireless Device*, CTIA BLOG, July 20, 2011, <http://blog.ctia.org/2011/07/20/how-to-manage-your-wireless-account-using-your-wireless-device/>; see also Verizon Wireless, MyVerizon, [http://support.verizonwireless.com/faqs/Account%20Management/faq\\_my\\_account\\_online.html](http://support.verizonwireless.com/faqs/Account%20Management/faq_my_account_online.html) (last visited Dec. 5, 2011) (click on “MyVerizon” in task bar and usage can be viewed upon login); Cellcom Inc., Support, <http://www.cellcom.com/faq.html> (last visited Dec. 5, 2011) (MyCellcom allows users to view recent invoices, make payments and check minutes, data and messaging use); SouthernLINC, MyLINC, <http://www.southernlinc.com/customersupport/> (last visited Dec. 5, 2011) (online account access allows users to view their usage activity and make payments online); U.S. Cellular, My Account, <https://loginknx.uscc.com/nidp/idff/sso?id=38&sid=1&option=credential&sid=1> (last visited Dec. 5, 2011) (“Login” and there one can view minutes used).

<sup>166</sup> CTIA Consumer Code at 5.

mobile broadband (e.g., data card, mobile hotspot, tablet, netbook) users, Verizon Wireless provides an estimate of usage since the last bill cycle each time the customer logs on to VZAccess Manager, and sends text messages and/or emails when they reach 50 percent, 75 percent, 90 percent, 100 percent, and 110 percent of their monthly allowance. These alerts are provided free of charge.<sup>167</sup>

***Third Party Information.*** In addition, third party sources provide consumers with overviews and comparisons of wireless carriers' offerings and competitive strengths. Consumer Reports provides information comparing the major nationwide providers in 26 metropolitan areas, as well as extensive details regarding the features of commonly used devices.<sup>168</sup> PC World and PC Magazine also have published detailed studies comparing the major wireless carriers' networks and mobile broadband services.<sup>169</sup> J.D. Power and Associates conducts a semiannual wireless user survey that rates providers by region.<sup>170</sup> American Customer Satisfaction Index ("ACSI") measures wireless customer satisfaction for the major providers.<sup>171</sup> These third-party sources provide consumers with substantial information about wireless services and products to help them make an informed choice among the variety of competitors and service options.

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<sup>167</sup> *Ex Parte* Notice from Donna Epps, Vice President Federal Regulatory Affairs, Verizon, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 10-207 at 3, 5 (filed July 27, 2011).

<sup>168</sup> *Recommended Cell Phone Services*, CONSUMER REPORTS, Jan. 2011 at 26-38 (offering advice, ratings, and recommendations on types of phones, brands, features, and more).

<sup>169</sup> Mark Sullivan, *4G Wireless Speed Tests: Which Is Really the Fastest?*, PC WORLD, Mar. 13, 2011, [http://www.pcworld.com/article/221931/4g\\_wireless\\_speed\\_tests\\_which\\_is\\_really\\_the\\_fastest.html](http://www.pcworld.com/article/221931/4g_wireless_speed_tests_which_is_really_the_fastest.html) (comparison of four national carriers in 260 locations over 13 U.S. cities); Sascha Segan, *The Fastest Mobile Networks 2011*, PC MAGAZINE, June 27, 2011, <http://www.pcmag.com/Fastest-Mobile-Networks-2011> (21-city test across the U.S. using 16 handsets).

<sup>170</sup> See J.D. Power and Associates, 2011 Wireless Call Quality Ratings (Volume 1), [http://www.jdpower.com/telecom/ratings/wireless-call-quality-ratings-\(volume-1\)](http://www.jdpower.com/telecom/ratings/wireless-call-quality-ratings-(volume-1)) (last visited Dec. 1, 2011).

<sup>171</sup> See American Customer Satisfaction Index, Scores By Industry, Wireless Telephone Service, [http://theacsi.org/index.php?option=com\\_content&view=article&id=147&catid=&Itemid=212&i=Wireless+Telephone+Service](http://theacsi.org/index.php?option=com_content&view=article&id=147&catid=&Itemid=212&i=Wireless+Telephone+Service) (last visited Dec. 1, 2011) ("ACSI Wireless Industry Scores").

*Customer Care.* Mobile wireless carriers also are keenly aware of the need to compete to provide the very best customer care. In a 2011 customer care study, J.D. Power and Associates found that “[s]witching intent is four times as high among those who rate their wireless carrier below average in customer care, so the challenge for wireless carriers is to offer an easy and efficient customer care transaction experience.”<sup>172</sup> The study also found that the vast majority of customers (88 percent) connect with their carrier on their first attempt to contact them.<sup>173</sup> Indeed, if carriers do not respond to customer concerns in a timely manner, consumers have not hesitated to use the blogosphere to quickly disseminate their concerns world-wide, further encouraging carriers to respond rapidly.<sup>174</sup>

Verizon Wireless has invested heavily in customer service operations.<sup>175</sup> On a daily basis, the company engages in about 4.2 million transactions with new, existing, and potential customers; its call centers also process over 493,000 calls and e-mail transactions daily.<sup>176</sup> Customers also may utilize self-serve options, including on-line, handset-accessible, or interactive voice response call-in systems, to address their needs.<sup>177</sup>

Other wireless companies have implemented diverse strategies to distinguish their customer care from their competitors. For example, after the earthquake and tsunami devastated

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<sup>172</sup> J.D. Power and Associates, 2011 Wireless Customer Care Performance Study – Vol. 1, <http://www.jdpower.com/news/pressrelease.aspx?ID=2011010> (last visited Dec. 1, 2011).

<sup>173</sup> *Id.*

<sup>174</sup> *See, e.g.*, PhoneDog, News, [www.phonedog.com](http://www.phonedog.com) (last visited Nov. 30, 2011); Mobile Phone Blog, Mobile Phone Blog Home Page, [www.mobilephoneblog.org](http://www.mobilephoneblog.org) (last visited Nov. 30, 2011); Wireless Blogger, Home Page, [www.wirelessblogger.com](http://www.wirelessblogger.com) (last visited Nov. 30, 2011).

<sup>175</sup> *See* Verizon Wireless, Explore, Customer Satisfaction Overview, <http://about.us.verizonwireless.com/customersatisfaction/index.html> (last visited Dec. 1, 2011).

<sup>176</sup> *See id.*

<sup>177</sup> *See id.*

Japan, MetroPCS offered free calls and texts to customers trying to connect with friends and family in Japan.<sup>178</sup> U.S. Cellular offers a reward plan under which customers earn points for signing up for the company’s “Belief Plans,” remaining a U.S. Cellular customer, completing online surveys, using U.S. Cellular’s contacts backup, downloading the company’s “daily perks” application (which provides helpful tips, discounts, offers, and bonus information), or referring a friend to U.S. Cellular. Customers can redeem those points for phones, accessories, ringtones, adding lines, and overage forgiveness.<sup>179</sup>

For consumers with limited knowledge about how to work their smartphones, Alaska Communications Systems offers smartphone group help sessions and one-on-one help at store locations.<sup>180</sup> Jitterbug, the mobile phone service targeting an older demographic, offers *Daily Health Tips*, including text messages providing “helpful information on exercising, eating right and living a heart-healthy lifestyle.”<sup>181</sup> C Spire offers *Inner Circle*, which allows members to “test new services and products before they are available to the public.”<sup>182</sup> Companies such as TúYo, a wireless MVNO targeting the rapidly growing U.S. Hispanic community, offer a call-in feature that allows customers’ families and friends in their home countries to avoid costs by using the customer’s account balance.<sup>183</sup>

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<sup>178</sup> Press Release, MetroPCS, MetroPCS Offers Free Calls and Texts to Customers Trying to Connect with Friends and Family in Japan (Mar. 16, 2011), <http://www.metropcs.com/presscenter/newsreleasedetails.aspx?id=15>.

<sup>179</sup> See U.S. Cellular, Rewards Program, Belief Plans, <http://www.uscellular.com/the-belief-project/rewards/earn-and-redeem-points.html> (last visited Dec. 1, 2011).

<sup>180</sup> Alaska Communications Systems, Smartphone Help, <http://www.AlaskaCommunications.com/Personal/Wireless/Smartphone-Help.aspx> (last visited Dec. 1, 2011).

<sup>181</sup> GreatCall, Daily Health Tips, <http://www.greatcall.com/Jitterbug/AppStore/GreatHealth/daily-health-tips.aspx> (last visited Dec. 1, 2011).

<sup>182</sup> C Spire, Inner Circle, [http://www.cspire.com/community/inner\\_circle/](http://www.cspire.com/community/inner_circle/) (last visited Nov. 30, 2011).

<sup>183</sup> TúYo Mobile, About Us, Corporate Overview, <http://www.tuyo.com/about/default.aspx> (last visited Dec. 1, 2011); see TúYo Mobile, Call-In Feature, <http://www.tuyo.com/rates/conecta2.aspx> (last visited Dec. 1, 2011).

**c. Wireless Advertising Also Reveals the Fierce State of Competition**

As further evidence of the robustly competitive wireless market, providers engage in aggressive marketing efforts to inform consumers about their service offerings. Wireless companies spend enormous amounts on web, print, and broadcast advertising, as is evident from any online experience, looking at any newspaper, or watching television. National wireless providers as well as many mid-sized carriers and MVNOs are major advertisers. According to Nielsen, in the first half of 2010, “wireless service telephone” was the seventh highest-spending product category for advertising in the U.S. economy, spending \$1.518 billion.<sup>184</sup> These significant efforts in using advertising to reach potential as well as existing customers underscore the intensity of wireless companies’ competitive efforts.

**B. The Structure of the Mobile Market Demonstrates its Competitiveness**

**1. The Wireless Industry Structure Drives This Dynamic and Highly Competitive Market**

The dynamic and highly competitive nature of the overall market for wireless services is supported and driven by numerous and diverse participants striving to attract and keep customers in the face of a multitude of alternative providers. This current market structure and ability of new entrants to compete further strengthens mobile services competition.

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<sup>184</sup> For the first half of 2010, advertising spending by wireless providers trailed only the automotive, pharmaceutical, motion picture, quick service restaurant, dealerships, and department store categories. Nielsen Company, Global Ad Spending Shows Signs of Growth, NIELSEN BLOG, Oct. 11, 2010, <http://blog.nielsen.com/nielsenwire/global/global-ad-spending-shows-signs-of-growth/>; see also *Fifteenth Report*, 26 FCC Rcd at 9748 ¶ 130.

**a. Diverse Providers Now in the Marketplace Include Over 175 Facilities-Based Operators and Many MVNOs**

The market for mobile wireless service is populated by a wide range of providers offering services under a variety of business models. According to the FCC’s most recent data, there are 181 facilities-based mobile providers<sup>185</sup> and countless resellers/mobile virtual network operators (“MVNOs”). Alternative sources of connectivity, such as WiFi, are expanding consumer choice in the wireless services market as well. Below we highlight the roles played by some of the key providers in this dynamic market.

*Nationwide Facilities-Based Providers Enhance Service Quality and Intensify Competition.* There are four “nationwide” providers – Verizon Wireless, AT&T, Sprint Nextel, and T-Mobile – each offering facilities-based service to the vast majority of Americans. As set forth above, these providers vie aggressively with one another and with others in a wireless services market that competes on price and service plans, on network coverage and next-generation capabilities, on device and operating system availability, on customer care, and more.

As Verizon Wireless has previously explained, the current “nationwide provider” market segment is the result of a long period of market expansion and consolidation driven by technological and economic factors governing the wireless industry, and this progression has redounded strongly to the benefit of the consumer.<sup>186</sup> As it became apparent that scale

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<sup>185</sup> See, e.g., INDUSTRY ANALYSIS AND TECHNOLOGY DIVISION, FCC, LOCAL TELEPHONE COMPETITION: STATUS AS OF DECEMBER 31, 2010, at 28 tbl.17 (Oct. 2011), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2011/db1007/DOC-310264A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1007/DOC-310264A1.pdf) (“Dec. 2010 Local Telephone Competition Data”) (containing data on mobile wireless telephone subscribers, and providing a sum of the total number of mobile facilities-based carriers in the U.S.).

<sup>186</sup> See, e.g., Comments of Verizon Wireless, WT Docket No. 10-133, at 10-12 (filed July 30, 2010) (“Verizon Wireless 2010 Competition Comments”); Comments of Verizon Wireless, WT Docket No. 09-66, at 20-22 (filed Sep. 30, 2009) (“Verizon Wireless 2009 Competition Comments”).

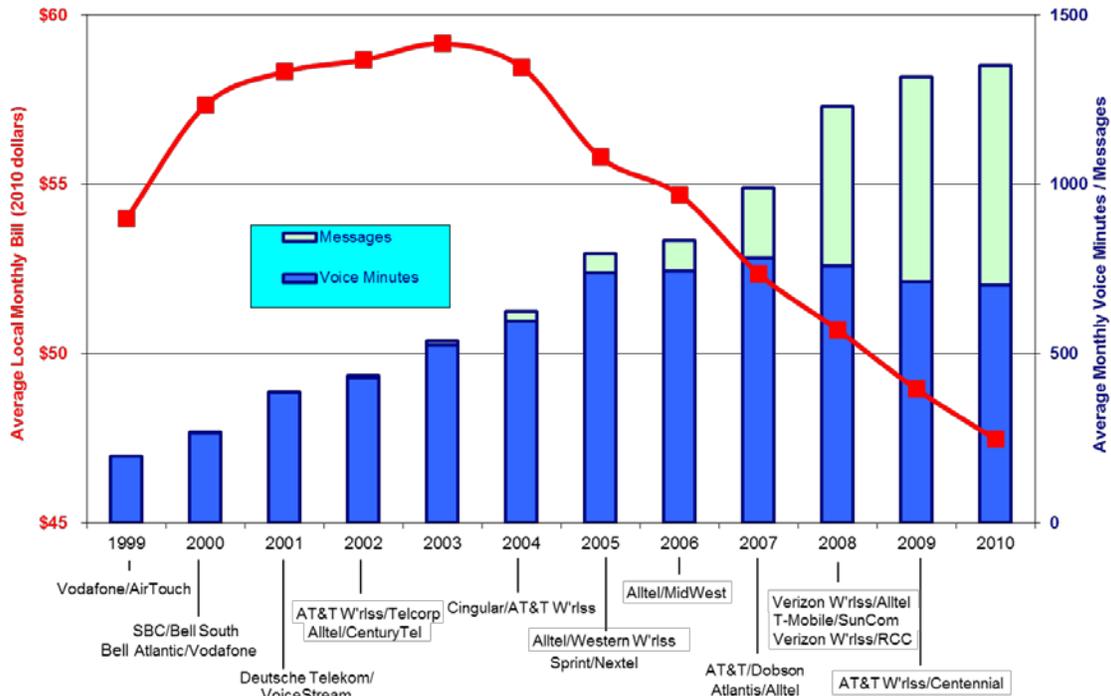
economies rendered the early, highly fragmented cellular industry inefficient, the Commission and carriers alike recognized the benefits associated with consolidation and facilitated policies, such as secondary markets, that encouraged a more efficient market structure.<sup>187</sup> This structure also more accurately reflected demand as consumers and business customers each increasingly sought out the nationwide services and pricing that more national providers offered. The current market structure reflects this history and the technological features of the wireless telecommunications sector, and has promoted, not undermined, consumer welfare. As the following chart demonstrates, the development of a more consolidated market structure nationally has coincided with massively increased wireless usage and precipitous declines in pricing:

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<sup>187</sup> The Commission has previously acknowledged that “operators with larger footprints can achieve certain economies of scale and increased efficiencies compared to operators with smaller footprints,” and that such efficiencies permitted carriers to introduce new service options, “reducing prices to consumers.” 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, *Sixth Report*, 16 FCC Rcd 13350, 13362-63 (2001) (“*Sixth Report*”) (internal citations omitted).

### Wireless Services: Increasing Use, Decreasing Price

Source: CTIA's Wireless Industry Indices YE-2010 Report



Source: Data from CTIA's Wireless Industry Indices Year-End 2010 Report. Monthly bill adjusted for inflation.

The combination of greater geographic reach and network investment also has enabled the combined entities to achieve improvements in service quality, enhancements in functionality, and the deployment of more robust and ubiquitous wireless broadband services.<sup>188</sup> The emergence of nationwide carriers reflects a response to technological change, shifting economic realities, and – fundamentally – consumer need.

<sup>188</sup> See, e.g., Applications of AT&T Inc. and Centennial Communications Corp., *Memorandum Opinion and Order*, 24 FCC Rcd 13915, 13960 ¶ 110 (2009); Applications of Cellco Partnership, d/b/a Verizon Wireless and Atlantis Holdings LLC, *Memorandum Opinion and Order and Declaratory Ruling*, 23 FCC Rcd 17444, 17446-47 ¶ 3 (2008) (“*Verizon Wireless-Alltel Order*”); Applications of Cellco Partnership d/b/a Verizon Wireless and Rural Cellular Corporation, *Memorandum Opinion and Order and Declaratory Ruling*, 23 FCC Rcd 12463, 12465 ¶ 3 (2008) (“*Verizon Wireless-Rural Order*”); Applications of T-Mobile USA, Inc. and SunCom Wireless Holdings, Inc., *Memorandum Opinion and Order*, 23 FCC Rcd 2515, 2519-20 ¶¶ 9-10 (2008); Applications of AT&T Inc. and Dobson Communications Corporation, *Memorandum Opinion and Order*, 22 FCC Rcd 20295, 20296 ¶ 2 (2007) (“*AT&T-Dobson Order*”); Applications of Nextel Communications, Inc. and Sprint Corporation, *Memorandum Opinion and Order*, 20 FCC Rcd 13967, 13969 ¶ 3 (2005); Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation, *Memorandum Opinion and Order*, 19 FCC Rcd 21522, 21525-26 ¶ 5 (2004) (“*AT&T-Cingular Order*”).

***Other Facilities-Based Providers Expand Consumer Choice.*** The nationwide wireless services sector is not limited to the four “nationwide” providers. An emerging fifth provider, Clearwire, offers 4G WiMax services directly to consumers and has fostered new entrants by entering into numerous wholesale/MVNO relationships.<sup>189</sup> Since launching WiMax service in 2009, Clearwire has become “one of the fastest growing companies in the wireless industry” with networks covering 133 million people in 88 markets.<sup>190</sup> In 2010, Clearwire increased its total subscriber base by almost 3.7 million subscribers to 4.4 million.<sup>191</sup> Clearwire expects to have more than 10 million subscribers, more than doubling its customer base, by the end of 2011.<sup>192</sup> Backed by investment from Sprint Nextel, Google, Intel and a number of leading cable operators, Clearwire also continues to innovate with its announcement to add “LTE Advanced-ready,” a time division duplex service technology, to its 4G network.<sup>193</sup>

In addition, multiple regional carriers play a significant role in shaping the competitive industry and the consumer experience. For example, Leap Wireless (“Leap”), whose licenses cover approximately 184.6 million people, provides nationwide voice and 3G data services through its own network and multiple roaming agreements. Leap’s nationwide coverage now includes approximately 285 million POPs,<sup>194</sup> and it will begin offering 4G service in 2012.<sup>195</sup>

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<sup>189</sup> Press Release, Clearwire, Clearwire Announces Intent to Add LTE to Its Network to Accelerate Wholesale Business (Aug. 3, 2011), <http://corporate.clearwire.com/releasedetail.cfm?ReleaseID=596508> (“Clearwire Aug. 2011 Press Release”).

<sup>190</sup> See Clearwire Corp., Quarterly Report (Form 10-Q), at 7, 29 (Aug. 4, 2011), <http://www.sec.gov/Archives/edgar/data/1442505/000095012311072552/v57546e10vq.htm>; Clearwire, The Clearwire Story, <http://www.clearwire.com/company/our-company> (last visited Nov. 30, 2011).

<sup>191</sup> Clearwire Corp., Annual Report (Form 10-K), at 2 (Feb. 22, 2011).

<sup>192</sup> Press Release, Clearwire, Clearwire Reports Record Third Quarter Results (Nov. 2, 2011), <http://corporate.clearwire.com/releasedetail.cfm?ReleaseID=620322>.

<sup>193</sup> Clearwire Aug. 2011 Press Release.

<sup>194</sup> See Leap Wireless International, Inc., Annual Report (Form 10-K), at 2 (Feb. 25, 2011).

MetroPCS, whose licenses cover approximately 142 million people, serves many major markets and, with roaming agreements, has a coverage area that includes more than 280 million POPs.<sup>196</sup> As noted above, MetroPCS became the first carrier to launch LTE service in the U.S. in September 2010 and now offers LTE service in fourteen market areas.<sup>197</sup> U.S. Cellular, whose licenses cover at least 90.5 million people, operates in 26 states, has deployed 3G to 98 percent of its covered POPs, and will begin offering 4G LTE service in early 2012.<sup>198</sup>

Competition is also driven by the behavior of numerous smaller facilities-based carriers, including Allied Wireless d/b/a Alltel Wireless, C Spire, Cincinnati Bell Wireless, NTELOS, Pocket Communications, and SouthernLINC, to name a few, which provide voice and broadband service to millions of Americans. According to one industry analyst, during the second quarter of 2011, Cincinnati Bell garnered “effective market share” of nearly 19 percent in the markets it serves.<sup>199</sup>

***Resellers/MVNOs Provide Additional Competition and Innovation.*** Mobile

resellers/MVNOs also play an important role in wireless competition and innovation. Because

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<sup>195</sup> See Michelle Maisto, *Cricket parent Leap Wireless to trial LTE this year, go big in 2012*, CONNECTEDPLANET, Nov. 1, 2011, <http://connectedplanetonline.com/mobile-apps/news/Cricket-parent-Leap-Wireless-to-trial-LTE-this-year-go-big-in-2012-1101/>.

<sup>196</sup> MetroPCS Communications, Inc., Annual Report (Form 10-K), at 6 (Mar. 1, 2011) (The markets served by MetroPCS include Atlanta, Boston, Dallas/Ft. Worth, Detroit, Las Vegas, Los Angeles, Miami, New York, Orlando/Jacksonville, Philadelphia, Sacramento, San Francisco, and Tampa/Sarasota metropolitan areas.).

<sup>197</sup> MetroPCS 4G Coverage Map.

<sup>198</sup> United States Cellular Corp., Annual Report (Form 10-K), at 1 (Feb. 25, 2011); Press Release, U.S. Cellular to Launch 4G LTE Service and Devices in Time for the Holidays (May 6, 2011), (“U.S. Cellular May 2011 Press Release”) <http://www.uscellular.com/about/press-room/2011/USCELLULAR-TO-LAUNCH-4G-LTE-SERVICE-AND-DEVICES-IN-TIME-FOR-THE-HOLIDAYS.html>; Press Release, U.S. Cellular Announces Readiness of 4G LTE Network (Nov. 4, 2011), <http://www.uscellular.com/about/press-room/2011/USCELLULAR-ANNOUNCES-READINESS-OF-4G-LTE-NETWORK.html>.

<sup>199</sup> See UBS WIRELESS 411 REPORT at tbl.14. According to UBS, “effective market share” is the percentage share of gross adds each carrier has relative to its coverage area in a given quarter.

resale does not require the acquisition of spectrum or the build out of extensive infrastructure, MVNOs enjoy considerable flexibility on what services to offer and where.<sup>200</sup> New entrants are constantly emerging.<sup>201</sup> The MVNO/resale segment has continued to grow<sup>202</sup> and is expected reach 11.7 percent in North America by the end of 2015.<sup>203</sup>

The success of MVNOs in competing directly with facilities-based providers (including, of course, the underlying providers on whose networks they rely) is beyond dispute. Unaffiliated MVNO TracFone ranks fifth among *all* providers of mobile service, facilities-based or otherwise, with 19.3 million subscribers in the U.S. market, as of September 2011.<sup>204</sup>

The success of MVNOs goes well beyond TracFone, and mobile network operators are focusing more resources on further developing the wholesale segment. For instance, Sprint Nextel has recently announced that it plans to increase the number of wholesale customers by 10

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<sup>200</sup> Notably, facilities-based wireless providers sell carriage to MVNOs on an entirely voluntary basis, given the sunset of the Commission's mandatory resale rules in 2002. The Commission's resale rule sunset on November 24, 2002 in accordance with the Commission's 1996 decision that the rule would sunset "five years after we award the last group of initial licenses for currently allocated broadband PCS spectrum." Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services, *First Report and Order*, 11 FCC Rcd 18455, 18468-69 ¶ 24 (1996).

<sup>201</sup> See, e.g., Press Release, Flint Telecom Group, Inc., Flint Telecom completes launch of Flint Mobile (Apr. 26, 2011), [http://www.flinttelecomgroup.com/index.php?page=pressrelease&action=view&pressrelease\\_id=58](http://www.flinttelecomgroup.com/index.php?page=pressrelease&action=view&pressrelease_id=58) (launching Flint Mobile – a full service MVNO); Press Release, Stonehenge Telecom, Stonehenge Telecom Signs Contract with Sprint (Oct. 6, 2011), <http://www.prweb.com/releases/2011/10/prweb8854087.htm> (launching Stonehenge Mobile).

<sup>202</sup> As of December 31, 2010, the resale segment comprised 9% of mobile telephony subscribers, up from 8% as of December 31, 2009. See Dec. 2010 Local Telephone Competition Data, at 28 tbl.17; INDUSTRY ANALYSIS AND TECHNOLOGY DIVISION, FCC, LOCAL TELEPHONE COMPETITION: STATUS OF DECEMBER 31, 2009, at 29, tbl.17 (rel. Jan. 2011), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-304054A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-304054A1.pdf).

<sup>203</sup> INFORMA, GLOBAL MVNO FORECASTS TO 2015, at 1 (5<sup>th</sup> Ed., 2011). Despite the continued growth of MVNO market share, the Commission continues to downplay the role that MVNOs play in wireless ecosystem. See, e.g., *Fifteenth Report*, 26 FCC Rcd at 9698 ¶ 32. See *infra* Section V.C.2.

<sup>204</sup> América Móvil, América Móvil's Third Quarter of 2011 Financial and Operating Report, at 3 (Oct. 27, 2011), [http://www.americamovil.com/amx/en/cm/reports/Q/3Q11\\_VF.pdf](http://www.americamovil.com/amx/en/cm/reports/Q/3Q11_VF.pdf). América Móvil offers "wireless services and products in [its] United States segment through [its] subsidiary TracFone under the TracFone, Net10, Straight Talk and SafeLink brands." América Móvil, S.A.B. DE C.V. ("América Móvil"), SEC Form 20-F, filed May 13, 2011, at 39.

percent over the next year, and is now “offering its wholesale customers services such as billing, marketing support and competitive analysis, rather than just selling them capacity.”<sup>205</sup> The MVNO platform also has enabled competition from international carriers, such as NTT Docomo, Inc. through its Docomo USA Wireless offering.<sup>206</sup>

Although the precise number is difficult to ascertain, the Commission has previously recognized estimates of between approximately 40 and 60 MVNOs operating in the U.S. market.<sup>207</sup> Many MVNOs are providing a wireless service targeted to a specific demographic or submarket.<sup>208</sup> In addition to TracFone, these MVNOs include the following:

**MVNO Examples**

MVNO	Specialization
9278 Mobile	Recent Immigrants
CREDO Mobile	Socially Responsible Consumer
Firefly Mobile	Kids and Tweens
Jitterbug	Senior Citizens
Kajeet	Youth (pre-teens to early teenagers)
Movida Communications	U.S. Hispanics
Red Pocket Mobile	Chinese American Community
Shaka Mobile	Diaspora Africans
TúYo Mobile	U.S. Hispanics

Source: [www.prepaidmvno.com](http://www.prepaidmvno.com)

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<sup>205</sup> Phil Goldstein, *Sprint Wants to Increase Wholesale Customers by 10%*, FIERCEWIRELESS, Nov. 14, 2011, <http://www.fiercewireless.com/story/sprint-wants-increase-wholesale-customers-10/2011-11-14>.

<sup>206</sup> See *NTT DoCoMo USA unveils US MVNO Services and is Live*, PREPAIDMVNO, Apr. 11, 2011, <http://www.prepaidmvno.com/2011/04/11/ntt-docomo-usa-unveils-its-us-mvno-services-and-is-live/> (stating the NTT DoCoMo USA launched its US MVNO service on Apr. 6, 2011). See also Phil Goldstein, *China Telecom to Launch U.S. MVNO in 2012*, FIERCEWIRELESS, Nov. 9, 2011, <http://www.fiercewireless.com/story/china-telecom-launch-us-mvno-2012/2011-11-09> (reporting that “China Telecom will start selling wireless service in the United States under its own brand as an MVNO next year”).

<sup>207</sup> See *Fifteenth Report*, 26 FCC Rcd at 9699 ¶ 34.

<sup>208</sup> See, e.g., TelecomPaper, *MVNOs – United States*, <http://www.telecompaper.com/research/mvno-list/united-states> (last visited Dec. 5, 2011); PrepaidMVNO, *US MVNO Companies*, <http://www.prepaidmvno.com/mvno-companies/north-american-mvno-companies/us-mvno-companies/> (last visited Dec. 1, 2011).

Many MVNOs are creating and deploying new and innovative service models, including mobile broadband only, specialized data-only, and machine-to-machine (“M2M”) offerings. For example, in July 2010, Best Buy launched the first U.S. mobile-broadband-only MVNO service – “Best Buy Connect,”<sup>209</sup> and recently expanded its mobile broadband offering to include 4G services.<sup>210</sup> Best Buy also is offering an innovative “Try before you buy offer: 100MB free per month” program that provides eligible purchasers of 4G embedded laptops with the initial 100MB per month of 4G service free of charge.<sup>211</sup>

Other MVNOs are exploring different niches in the mobile marketplace. Cytta Corporation (“Cytta”), a health-based MVNO, provides a remote medical monitoring system using its FDA-approved remote medical monitoring devices to communicate, via Bluetooth, with its own medical smartphone, which in turn transmits the data via a commercial mobile network to the caregivers.<sup>212</sup> In the M2M space, iMetrik has leveraged the MVNO platform to become a leading wireless solution provider dedicated to remote asset monitoring and control, offering an end-to-end solution that includes the monitoring device attached to the asset, wireless

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<sup>209</sup> KRISTIN PAULIN, INFORMA, CASE STUDY: BEST BUY’S MOBILE BROADBAND MVNO (Mar. 1, 2011), *included in* INFORMA GLOBAL MVNO FORECAST TO 2015.

<sup>210</sup> See Press Release, Clearwire, Best Buy Launches Best Buy Connect, Supported By Clearwire’s 4G Network (Mar. 28, 2011), <http://www.clear.com/blog/best-buy-connect/>.

<sup>211</sup> See Best Buy Connect, 4G Plans – Laptops and Netbooks, <https://www.bestbuyconnect.com/wps/portal/Connect/ConnectSCPlan3Gand4G> (last visited Dec. 1, 2011) (“100MB Free 4G RATE PLAN: Best Buy Connect will allocate 100MB of data use per month free of charge to eligible customer accounts ...”).

<sup>212</sup> See Press Release, Cytta Corp., First Client Installation of CyttaConnect(TM) Medical Monitoring System (Sep. 12, 2011), <http://www.marketwatch.com/story/first-client-installation-of-cyttaconnecttm-medical-monitoring-system-2011-09-12>; Cytta Corp., Services, <http://cytta.com/services.html> (last visited Dec. 1, 2011); Press Release, Cytta Corp., Cytta to Become Medical Mobile Virtual Network Operator in the USA (Nov. 15, 2010), <http://www.prepaidmvno.com/2010/11/15/cytta-to-become-medical-mobile-virtual-network-operator-in-the-usa/>.

connectivity to the data center via an MVNO arrangement, and an application to track and control assets.<sup>213</sup>

*Emerging Sources of Wireless Service and New Competitive Pressures.* In addition to the providers described above, the Commission's competitive analysis must also account for other emerging suppliers of connectivity and competition. These offerings, both current and planned, confirm the presence and growth of additional substantial competitive opportunities in the sector. For example, as noted above, carriers like U.S. Cellular, C Spire, and ACS have entered, or are in the process of entering, the 4G wireless marketplace with their LTE deployments.

Consumers are also increasingly seeking out WiFi as an alternative to accessing broadband over the licensed networks of mobile providers. According to one estimate, there were more than 109,000 WiFi hotspots (free or paid) in the U.S. as of November 14, 2011.<sup>214</sup> And 85 percent of tablets are WiFi-only<sup>215</sup> with almost 80 percent of smartphones having both cellular and WiFi connectivity.<sup>216</sup> There are also a number of Wireless Internet Service Providers

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<sup>213</sup> See, e.g., iMetrik M2M Solutions, Incorporated, Investor Relations, <http://www.imetrikm2m.com/execsummary.html> (last visited Dec. 1, 2011). The iMetrik products and services provide remote monitoring of assets as diverse as automobiles and sump pumps. See, e.g., iMetrik Solutions, Incorporated, FAQ, <http://www.imetrik.com/portal/en/faq/index.html> (last visited Dec. 1, 2011); Press Release, iMetrik M2M Solutions, Incorporated, iMetrik M2M's Wireless Monitoring Solution Chosen by America's #1 Sump Pump Manufacturer, Metropolitan Industries (Oct. 11, 2011), [http://www.imetrikm2m.com/pr\\_2011-10-11.html](http://www.imetrikm2m.com/pr_2011-10-11.html).

<sup>214</sup> See JiWire, Wi-Fi Finder, <http://v4.jiwire.com/search-hotspot-locations.htm> (last visited Dec. 1, 2011).

<sup>215</sup> CHETAN SHARMA, CHETAN SHARMA CONSULTING, US WIRELESS MARKET UPDATE Q2 2011, Presentation at Mobile Future Forward, Seattle, Wash., at 6 (Sep. 12, 2011), ("US WIRELESS MARKET UPDATE Q2 2011") [http://www.chetansharma.com/US\\_Wireless\\_Market\\_Q2\\_2011\\_Update\\_Aug\\_2011\\_Chetan\\_Sharma\\_Consulting.pdf](http://www.chetansharma.com/US_Wireless_Market_Q2_2011_Update_Aug_2011_Chetan_Sharma_Consulting.pdf). Many of the most popular tablets are available in WiFi only versions, including Apple's iPad 2, Samsung's Galaxy Tab 10.1, Sony's Tablet S, and Amazon's Kindle Fire. Eric Franklin, *CNET Looks at Current and Upcoming Tablets*, CNET.COM, Nov. 14, 2011, [http://news.cnet.com/8301-17938\\_105-20037960-1/cnet-looks-at-current-and-upcoming-tablets/](http://news.cnet.com/8301-17938_105-20037960-1/cnet-looks-at-current-and-upcoming-tablets/).

<sup>216</sup> CHETAN SHARMA, CHETAN SHARMA CONSULTING, MANAGING THE GROWTH AND PROFITS OF CONNECTED DEVICES at 12 (Sep. 2011) ("MANAGING THE GROWTH AND PROFITS OF CONNECTED DEVICES").

(“WISPs”) – nearly 2000 in a recent count – that use fixed terrestrial wireless networks to provide broadband access to more than 2 million subscribers in unserved and underserved areas of the country.<sup>217</sup>

There also are emerging competitors committed to developing MSS spectrum for terrestrial mobile broadband services. For instance, DISH Network recently sought approval from the Commission to combine the S-Band spectrum licensees TerreStar Networks and DBSD North America and to offer nationwide MSS/ATC service and terrestrial-only devices using LTE-Advanced network technology.<sup>218</sup> Although faced with challenges related to potential interference with GPS receivers,<sup>219</sup> LightSquared continues to move forward with its plans to deploy and offer wholesale capacity on its proposed LTE-satellite network.<sup>220</sup>

In addition, VoIP providers are increasing their presence on mobile platforms and exerting competitive pressure on wireless providers. Republic Wireless launched its \$19 a month service that includes unlimited text, data, and voice using VoIP technology and specialized Android hardware. The service uses WiFi as its dominant form of voice and data communication, but also provides licensed connectivity through Sprint Nextel’s cellular

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<sup>217</sup> Matt Larsen, *America’s Broadband Heroes: Fixed Wireless Broadband Providers*, WISPA, at 2-3, Oct. 13, 2011, <http://www.wirelesscowboys.com/wp-content/uploads/2011/10/americas-broadband-heroes-fixed-wireless-2011.pdf>.

<sup>218</sup> See DISH Network Corporation Files to Acquire Control of Licenses and Authorizations Held By New DBSD Satellite Services G.P, Debtor-in-Possession and TerreStar License Inc., Debtor-in-Possession, *Public Notice*, 26 FCC Rcd 13018 (2011) (“*Dish-DBSD-TerreStar Public Notice*”).

<sup>219</sup> See, e.g., Sue Marek, *LightSquared: We Want to be the Dumbest Wireless Broadband Pipe*, FIERCEWIRELESS, Nov. 2, 2011, <http://www.fiercewireless.com/story/lightsquared-we-want-be-dumbest-wireless-broadband-pipe/2011-11-02>.

<sup>220</sup> See, e.g., LightSquared, About Us, <http://www.lightsquared.com/about-us/> (last visited Dec.1, 2011).

network.<sup>221</sup> T-Mobile launched its own VoIP service – Bobsled, a mobile app available for iOS and Android devices – that allows Facebook users to make free VoIP calls to other Facebook users.<sup>222</sup> In a host of ways, mobile VoIP technologies create an opportunity for “over-the-top” voice services, allowing users to opt for a broadband-based voice call rather than using their cellular voice minutes and/or paying international tolls.<sup>223</sup>

This wireless service market structure, both existing and emerging, is the framework for the dynamic market that exists today and offers tremendous promise for tomorrow.

**b. Ease of Entry Has Increased Competitive Pressure on All Providers**

A market’s competitiveness is also evidenced by the ability of new providers to enter. As reflected by the diverse array of market participants and new entrants described above, providers continue to explore new businesses and expand service via tried and true sources of entry – new spectrum and secondary markets.

*New Spectrum.* In the past five years, expansion in the availability of licensed spectrum has increased competition while also helping to address compelling capacity needs. The AWS and 700 MHz auctions, combined with the Commission’s removal of restrictions from the BRS/EBS and WCS spectrum, have created a significant entry vehicle for many potential providers, whether large or small, and whether local, regional or national. To take just a sample

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<sup>221</sup> See Jason Kincaid, *Republic Wireless Officially Unveils \$19/Month Service: Unlimited Everything, No Contracts*, TECHCRUNCH, Nov. 7, 2011, <http://techcrunch.com/2011/11/07/republic-wireless-officially-unveils-19month-service-unlimited-everything-no-contracts/>.

<sup>222</sup> See Bobsled, <http://bobsled.com> (last visited Dec. 1, 2011); Brent Rose, *It’s Crazy Just How Much Free Calling T-Mobile Is Giving Away With Its Bobsled VoIP App*, GIZMODO, Oct. 11, 2011, <http://gizmodo.com/5848466/t-mobiles-voip-bobsled-just-got-an-olympic-sized-upgrade>.

<sup>223</sup> BANDWIDTH ARBITRAGE at 5. In one recent survey, 90% of likely buyers are interested in purchasing a smartphone with the capability for WiFi connectivity. MOBILE BROADBAND & MOBILE COMPUTING DEVICES at Fig. 5.

from the 2006 AWS-1 auction: Leap won AWS licenses covering 176 million POPs and launched AWS service in 2008.<sup>224</sup> MetroPCS won AWS licenses covering 144.5 million POPs, also launched AWS service in 2008,<sup>225</sup> and became the first carrier to launch LTE service in the U.S.<sup>226</sup> Auction-wide, more than half of the AWS-1 licenses won were acquired by small businesses that claimed designated entity status.<sup>227</sup> T-Mobile deployed its HSPA+ network using AWS-1 spectrum, which covers 191 markets and more than 200 million people.<sup>228</sup>

The 2008 700 MHz auction provided similar opportunities for new entrants and non-nationwide operators. Providers in the latter category won 754 (or 69 percent) of the 1090 licenses sold, and a non-nationwide wireless service provider won a license in every market.<sup>229</sup> Moreover, 55 percent of the winning bidders claimed designated entity bidding credits as a small business.<sup>230</sup> There also was substantial interest in rural areas among new players – 75 new

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<sup>224</sup> Press Release, Leap Wireless Int'l, Inc., Leap Launches First Advanced Wireless Services (AWS) Market with Full Capacity Retail and Network Introduction of Cricket Unlimited Wireless Service to Oklahoma City (Mar. 31, 2008), <http://phx.corporate-ir.net/phoenix.zhtml?c=191722&p=irol-newsArticle&ID=1123363>.

<sup>225</sup> Kevin Fitchard, *MetroPCS Northeast expansion begins*, CONNECTED PLANET, July 2, 2008, <http://connectedplanetonline.com/wireless/news/metropcs-aws-network-expansion-0702/>; Kevin Fitchard, *MetroPCS goes live in NYC, Boston*, CONNECTED PLANET, Feb. 4, 2009, <http://connectedplanetonline.com/wireless/news/metropcs-in-boston-nyc-0204>.

<sup>226</sup> See Sam Churchill, *MetroPCS: First with LTE in US*, DAILY WIRELESS.ORG, Sep. 21, 2010, <http://www.dailywireless.org/2010/09/21/metropcs-first-with-lte-in-us/>.

<sup>227</sup> News Release, FCC, Statement of Chairman Kevin J. Martin on the Conclusion of Advanced Wireless Services Auction (Sep. 18, 2006), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-267473A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-267473A1.pdf).

<sup>228</sup> T-Mobile, T-Mobile Network Technology, <http://t-mobile-coverage.t-mobile.com/4g-wireless-technology> (last visited Dec. 1, 2011); see also Fierce Wireless, T-Mobile will acquire AWS-3 and D block spectrum for 4G – 2011 predictions, <http://www.fiercewireless.com/special-reports/fiercewireless-predictions-2011/t-mobile-will-acquire-aws-3-and-d-block-spectrum-4g-> (last visited Dec. 5, 2011).

<sup>229</sup> News Release, FCC, Statement of Chairman Kevin J. Martin (Mar. 20, 2008), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-280968A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-280968A1.pdf).

<sup>230</sup> *Id.*

entities won 428 licenses in 305 rural service areas.<sup>231</sup> Together, then, these auctions put substantial new spectrum holdings in the hands of new entrants and small providers.

The Commission's National Broadband Plan found that the 50 MHz of spectrum in the FCC's pipeline would be "just a fraction of the amount that will be necessary to match growing demand."<sup>232</sup> In order to meet this demand, the Commission determined that 300 MHz of additional spectrum should be made available for wireless use by 2015, with an additional 200 MHz of spectrum made available for mobile, fixed, and unlicensed broadband use by 2020.<sup>233</sup> An influx of spectrum will provide critical additional competitive opportunities for new entrants and existing providers to expand their competitive offerings.

***Secondary Markets.*** A dynamic secondary market is an important spectrum management tool that allows spectrum to flow to its best and most efficient use as demand and supply conditions change.<sup>234</sup> The National Broadband Plan recognized that secondary markets may provide "the most expedient path to repurposing spectrum to broadband,"<sup>235</sup> and the Commission has taken several steps to facilitate wireless service providers' access to spectrum in the secondary market, including permitting partitioning and disaggregation of spectrum licenses and

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<sup>231</sup> *Id.*

<sup>232</sup> FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN 10 (Mar. 16, 2010), <http://www.broadband.gov/plan> ("NATIONAL BROADBAND PLAN").

<sup>233</sup> *Id.* at xii, 75-76, 84-85.

<sup>234</sup> See JOHN W. MAYO & SCOTT WALLSTEN, ENABLING EFFICIENT WIRELESS COMMUNICATIONS: THE ROLE OF SECONDARY SPECTRUM MARKETS 2 (June 2009), [https://www.techpolicyinstitute.org/files/wallsten\\_mayo\\_0609.pdf&sa=X&scisig=AAGBfm3xzbUWURqVsG2VX XZPFxJ0cILUbA&oi=scholar](https://www.techpolicyinstitute.org/files/wallsten_mayo_0609.pdf&sa=X&scisig=AAGBfm3xzbUWURqVsG2VX XZPFxJ0cILUbA&oi=scholar) ("MAYO-WALLSTEN").

<sup>235</sup> NATIONAL BROADBAND PLAN at 83.

spectrum leasing. These policies have helped achieve the Commission’s goal of “permit[ting] spectrum to flow more freely among users and uses in response to economic demand.”<sup>236</sup>

The National Broadband Plan recommended action on additional steps to ensure the effectiveness of secondary markets.<sup>237</sup> The Commission determined that a spectrum dashboard – “Internet-based software [that] enables user-friendly access to information regarding spectrum bands and licenses” – would promote a “robust secondary market in spectrum.”<sup>238</sup> The spectrum dashboard was launched in March 2010<sup>239</sup> as the first step in creating a comprehensive spectrum inventory,<sup>240</sup> and through Nov. 18, 2011 has been searched more than 200,000 times.<sup>241</sup> That usage averages out to 25,000 times per month, or 800 times per day.<sup>242</sup>

These and other Commission reforms have significantly expanded secondary market opportunities, granting licensees considerable flexibility and promoting competition – as well as a powerful financial incentive – to make unused spectrum available to other carriers. According to data compiled from the Commission’s Universal Licensing System (“ULS”), the number of

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<sup>236</sup> Fostering Innovation and Investment in the Wireless Communications Market; A National Broadband Plan for Our Future, *Notice of Inquiry*, 24 FCC Rcd 11322, 11331 n.27 (2009); *see also* Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking*, 19 FCC Rcd 17503, 17505 ¶ 1 (2004).

<sup>237</sup> NATIONAL BROADBAND PLAN at 75.

<sup>238</sup> *Id.* at 80.

<sup>239</sup> Spectrum Dashboard Launched in “Beta,” *Public Notice*, 25 FCC Rcd 2734 (WTB 2010).

<sup>240</sup> Spectrum Dashboard July Meeting Presentation (July 15, 2010), [http://www.fcc.gov/Daily\\_Releases/Daily\\_Business/2010/db0715/DOC-299830A1.pdf](http://www.fcc.gov/Daily_Releases/Daily_Business/2010/db0715/DOC-299830A1.pdf).

<sup>241</sup> *See* James Brown, *Spectrum Dashboard Gets an Upgrade*, FCC BLOG, Nov. 18, 2010, <http://reboot.fcc.gov/blog?entryId=998554>.

<sup>242</sup> *See id.*

approved transfer/assignment applications jumped from an average of roughly 620 per year for the years 1997-1999 to an average of approximately 2,400 for the years 2000-2010.<sup>243</sup>

A similar increase is seen in the leasing of spectrum. In 2003, the FCC adopted spectrum leasing rules for the Wireless Radio Services.<sup>244</sup> Since then, the number of spectrum lease applications/notifications filed has grown from 120 in 2004<sup>245</sup> to an average of 520 over the past four calendar years (2007-2010).<sup>246</sup> Indeed, as of mid-November 2011, there were 2,931 active spectrum leases listed in ULS.<sup>247</sup> Of those, 2,757 were “long term,” 2,075 of which involve arrangements where the lessee has *de facto* control over use of the spectrum.<sup>248</sup>

To more deeply analyze the efficacy of the leasing policy, Verizon Wireless for this proceeding undertook an examination of ULS data related to active leases of broadband PCS spectrum.<sup>249</sup> Verizon Wireless selected broadband PCS as being representative of a market-area licensed service appropriate for leasing (unlike cellular, which is largely site-licensed, and the BRS/EBS band, where a large number of leases pre-date the lease filing system and are therefore

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<sup>243</sup> MAYO-WALLSTEN at 21, tbl.3 (for years 1997-2008). For years 2009-2010, *see* ULS Advanced Application Search, <http://wireless2.fcc.gov/ULsApp/ApplicationSearch/searchAdvanced.jsp> (last visited Nov. 16, 2011). These figures are for approved applications, and thus do not reflect the total number of separate licenses or service areas in which spectrum was transferred. The primary radio services reflected in this calculation are Cellular, PCS, Paging, BRS, EBS, Microwave, Public Safety, Land Mobile, Industrial/Business, and Public Coast.

<sup>244</sup> Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Report and Order and Further Notice of Proposed Rulemaking*, 18 FCC Rcd 20604 (2003).

<sup>245</sup> MAYO-WALLSTEN at 22-23, tbls.4 and 5.

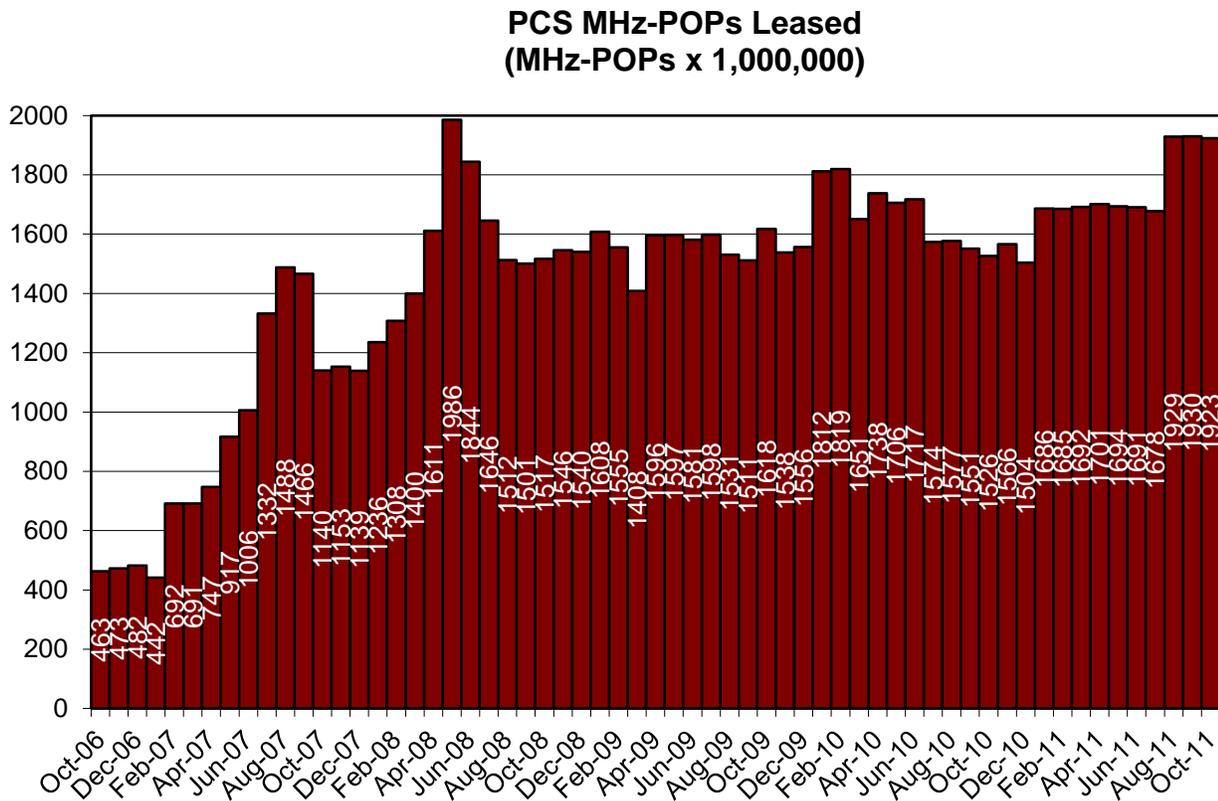
<sup>246</sup> *See* ULS Advanced Application Search, <http://wireless2.fcc.gov/ULsApp/ApplicationSearch/searchAdvanced.jsp> (last visited Dec. 5, 2011). Verizon Wireless limited its search to new lease applications/notifications (Application Purpose “LN”), excluding amendment applications, filed in each of the last four years.

<sup>247</sup> *See* ULS Lease Search, <http://wireless2.fcc.gov/ULsApp/ULsSearch/results.jsp> (last visited Dec. 5, 2011).

<sup>248</sup> *Id.*

<sup>249</sup> While the Mayo & Wallsten study cited above performs some analysis of the FCC’s secondary markets, its analysis concentrates on the number of completed leases. Verizon Wireless’s evaluation of the number of MHz-POPs actually under lease at any given point in time provides another metric for assessing the impact of secondary markets.

unavailable for analysis).<sup>250</sup> The results in the chart below demonstrate that, in fact, secondary markets are thriving:



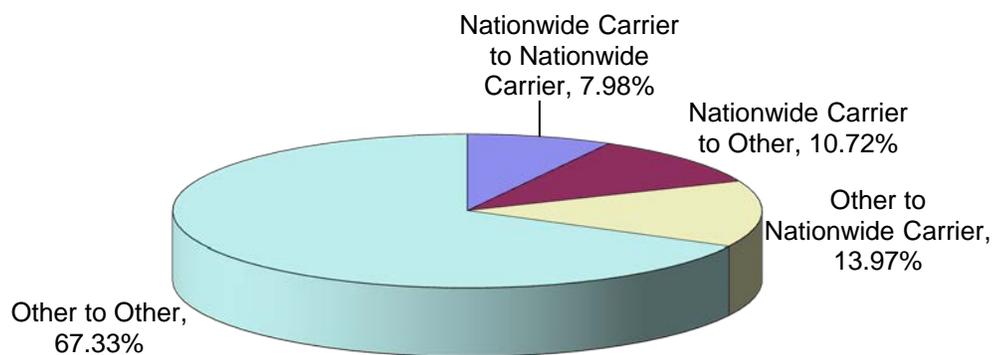
*Total Broadband PCS MHz-POPs Subject to Lease*

Further, there is no merit to the claim that small carriers cannot obtain spectrum through market-based mechanisms. To evaluate this assertion, Verizon Wireless analyzed assignments

<sup>250</sup> ULS lease data for PCS authorizations, database extract for Market Based Services as of September 20, 2009 for the period August 2005-September 2009. For the period October 2009-June 2010, Verizon Wireless utilized an extract from the Market Based Services database dated July 4, 2010. For the period July 2010-October 2011, Verizon Wireless utilized an extract from the Market Based Services database dated November 13, 2011. Data was limited to “CW” (PCS) leases in HD table, and net additions/subtractions to total amounts under lease were derived by multiplying POPs, as defined in MP table, by frequency bands under lease as shown in MF table, and then summing by lease. Leased MHz-POPs were increased upon Grant Date for lease in HD table and subtracted upon Cancellation Date shown in HD table. Data reflected in the chart does not include a small number of leases for undefined areas where POPs in the MP table was zero or null value. More information regarding the data contained in ULS records can be found in the ULS data dictionary, ULS Data File Formats (Feb. 12, 2009), [http://wireless.fcc.gov/uls/data/documentation/pa\\_ddef38.pdf](http://wireless.fcc.gov/uls/data/documentation/pa_ddef38.pdf).

and transfers of market-area and cellular authorizations from January 2010 through October 2011.<sup>251</sup> Verizon Wireless identified, for each transaction, whether the assignee/transferee or assignor/transferor was affiliated with Verizon Wireless, AT&T, Sprint Nextel, or T-Mobile (“Nationwide Carriers”). Based upon those classifications, the data show that the overwhelming majority of such transactions take place between non-Nationwide “Other” Carriers:

**Market Area/Cellular License Assignments, January 2010 - October 2011**



The robust state of the secondary market for the purchase and lease of spectrum, and the ways in which that market serves small and large carriers alike, is illustrated by the emergence of marketplace actors such as Spectrum Bridge Inc., which serves as a clearinghouse for secondary market transactions. Utilizing a “database-driven cognitive networking technology,” SpectrumBridge is redefining the “way in which spectrum is accessed, allocated and utilized.”<sup>252</sup>

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<sup>251</sup> Verizon Wireless obtained data from the FCC’s Assignments & Transfers data table dated Nov. 13, 2011. Verizon Wireless limited the dataset to those applications with a consummated status, where the consummation occurred between January 1, 2010 and October 31, 2011. Verizon Wireless also eliminated those applications that did not involve at least one market-based license or cellular license, defined as those authorizations that are currently “active” in either the L\_Market or L\_Cell database files.

<sup>252</sup> Spectrum Bridge, Markets We Serve, <http://spectrumbridge.com/AboutUs/markets.aspx> (last visited Dec. 1, 2011).

Specifically, Spectrum Bridge’s SpecEx data platform creates a marketplace for spectrum, facilitating buying, selling, and leasing of spectrum rights by wireless companies.<sup>253</sup> As of November 2011, SpecEx listed licenses in spectrum bands including 700 MHz, 800 MHz, AMTS, AWS, and EBS as available for purchase or lease across an assortment of states.<sup>254</sup>

Building on these successes, Verizon Wireless continues to urge the Commission to “fashion policies that better enable the growth and development of [secondary] markets.”<sup>255</sup> Through continued efforts to expand secondary market opportunities and facilitate secondary market transactions, the Commission will most effectively ensure continued access to spectrum – access which will promote innovation and investment.

## **2. The U.S. Market Compares Favorably Internationally**

A comparison of the U.S. market to other countries demonstrates that the U.S. wireless industry is highly competitive by any measure. First, there continue to be more wireless operators in the U.S. than in any other country. As noted previously, Commission data reflect that 181 facilities-based mobile providers offer wireless services; MVNOs and other competitors offer additional competitive options.<sup>256</sup> In the U.S., more than 89 percent of the U.S. population is covered by five or more facilities-based competitors, while more than 97 percent is covered by

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<sup>253</sup> See Spectrum Bridge, Overview, <http://spectrumbridge.com/AboutUs/Overview.aspx> (last visited Dec. 1, 2011); see also Spectrum Bridge, Frequently Asked Questions, <http://spectrumbridge.com/FAQs.aspx#SpecEx - Buying Spectrum> (last visited Dec. 1, 2011).

<sup>254</sup> See Spectrum Bridge, Spectrum Listing Search Options, <http://spectrumbridge.com/specex/search.aspx> (last visited Nov. 21, 2011).

<sup>255</sup> MAYO-WALLSTEN at 27.

<sup>256</sup> See *supra* n.185 and accompanying text; see also *Fifteenth Report*, 26 FCC Rcd at 9699 ¶ 34 (reporting that “[e]stimates of the number of MVNOs operating in the United States in the first quarter of 2010 vary from 43 to 61”).

at least three providers.<sup>257</sup> By contrast, of the top 26 Organization for Economic Co-Operation and Development (“OECD”) countries, only two – the U.S. and Canada – have five or more competitive providers.<sup>258</sup>

Further, although the Herfindahl–Hirschman Index (“HHI”) continues to be only one factor in evaluating market concentration, and is not determinative in any assessment of marketplace competition,<sup>259</sup> the following chart shows that, in 2010, the combined market share of the top three mobile operators in the U.S. wireless market was the second-lowest (above India) of the 12 leading global markets studied:

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<sup>257</sup> See *Fifteenth Report*, 26 FCC Rcd at 9705 ¶ 45, tbl.5.

<sup>258</sup> See *Ex Parte* Letter from Christopher Guttman-McCabe, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 09-157 *et al.*, at 5-6 (Apr. 29, 2010).

<sup>259</sup> See discussion *infra* Section V.C.1.



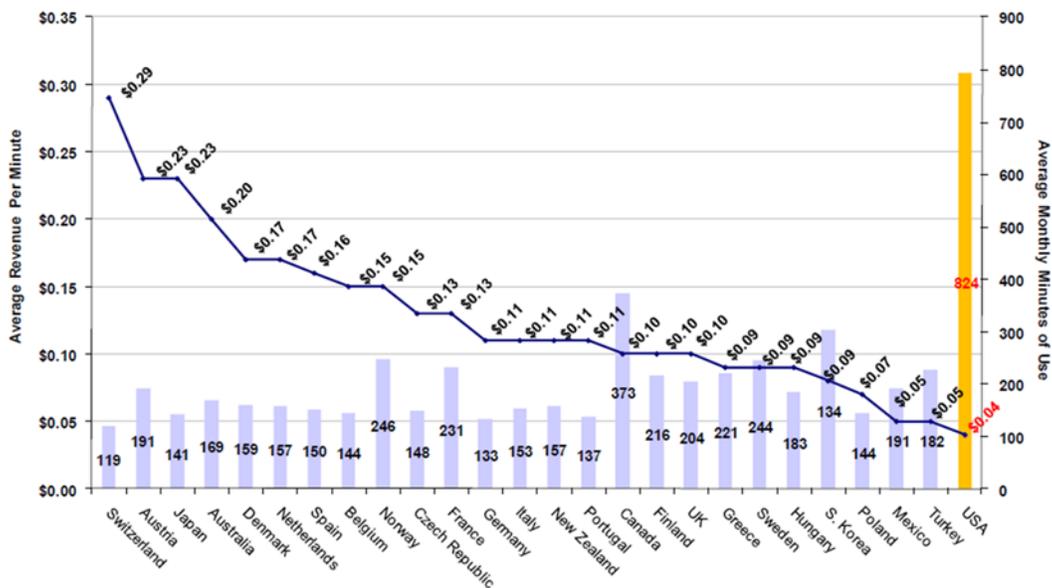
© Chetan Sharma Consulting, 2011

Source: CHETAN SHARMA CONSULTING, STATE OF GLOBAL MOBILE INDUSTRY <sup>260</sup>

U.S. mobile wireless subscribers benefit from this competitive landscape in tangible ways, as the following chart demonstrates with respect to the value metrics of per minute and monthly minutes of use (“MOUs”):

<sup>260</sup> See CHETAN SHARMA, CHETAN SHARMA CONSULTING, STATE OF GLOBAL MOBILE INDUSTRY: HALF YEARLY ASSESSMENT -2011 at 32 (July 2011), <http://www.chetansharma.com/mobilecompetition.htm>.

**The U.S. Offers the Most for the Money  
(Average Revenue per Voice Minute v. Average Monthly MOUs, YE2010)**



Source: CTIA (citing Bank of America Merrill Lynch Research, April 2011)<sup>261</sup>

As of year-end 2010, the average revenue per minute for wireless carriers in the U.S. was four cents, the lowest revenue per minute of the 26 OECD countries studied. By contrast, the average per-minute revenue for Japan was 23 cents, and some European countries were as high as 29 cents, more than seven times larger than the U.S.<sup>262</sup>

U.S. consumers also use more than twice as many MOUs as users in other OECD countries.<sup>263</sup> According to the study, Americans average 793 MOUs per month – and continue to use services at a rate nearly *seven times* greater than European OECD countries such as Switzerland (119 monthly MOUs).<sup>264</sup>

<sup>261</sup> See CTIA, THE WIRELESS INDUSTRY OVERVIEW 19 (June 13, 2011), [http://files.ctia.org/pdf/061311 - Wireless\\_Industry\\_Overview.pdf](http://files.ctia.org/pdf/061311_-_Wireless_Industry_Overview.pdf) (“CTIA Wireless Industry Overview”).

<sup>262</sup> See CTIA Wireless Industry Overview at 19-20.

<sup>263</sup> *Id.*

<sup>264</sup> *Id.*

In addition, as discussed below, the competitiveness of the U.S. marketplace is reflected in the numbers and types of network devices and applications available. For example, there is a tremendous variety of handset models and wireless devices available in the U.S., with more than 120 new smartphone models introduced in the U.S. between April 2010 and March 2011 as just one example.<sup>265</sup> Moreover, the U.S. mobile applications market is the largest and most competitive in the world, with at least ten competing application stores and over 500,000 applications available from the Apple App Store alone, and new applications being added constantly at an exponential rate.<sup>266</sup>

Lastly, and critically important for the future, U.S. wireless providers continue to be world leaders with respect to capital investment in networks and services. In 2010, U.S. providers invested approximately \$25 billion in their networks; the figure for the five largest European countries combined – France, Germany, Italy, Spain and the U.K. (“EU5”) – was \$13.5 billion.<sup>267</sup> Again, international comparative data confirm that the U.S. marketplace is the most competitive in the world – to the significant benefit of consumers here.

### **C. The Competitive Marketplace Has Led to Rising Consumer Satisfaction**

As carriers fight to win and retain customers in a vigorously competitive mobile ecosystem, overall wireless consumer satisfaction levels have reached new heights. In fact, the U.S. wireless industry leads the world in overall value, innovation, and investment.<sup>268</sup> It is

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<sup>265</sup> See *infra* Section III.A.3.

<sup>266</sup> See *infra* Section III.B.1.

<sup>267</sup> See CTIA, THE WIRELESS INDUSTRY FACTS: AN INDEPENDENT REVIEW 1 (July 2011), [http://files.ctia.org/pdf/2011-Independent\\_Assessment\\_of\\_Wireless\\_Industry.pdf](http://files.ctia.org/pdf/2011-Independent_Assessment_of_Wireless_Industry.pdf).

<sup>268</sup> *Id.*

therefore not surprising that U.S. consumers use their mobile devices and services more than any consumers in the world.<sup>269</sup> Even with the low barriers to customer switching described below, customer switching among carriers, as measured by “churn,” has decreased.<sup>270</sup> Moreover, regular surveys of Americans’ opinions and low instances of customer complaints show that wireless competitors are succeeding in their efforts to meet customers’ needs and expectations.

### **1. Surveys Consistently Report High Numbers of Satisfied Customers**

The Government Accountability Office (“GAO”), the Commission, ACSI, and Consumer Reports have each reported that the wireless industry has increasingly high consumer satisfaction. The Commission’s own survey, for example, released on June 1, 2010, found that 92 percent of surveyed cell phone users are either very satisfied or somewhat satisfied with their overall cell phone service.<sup>271</sup> Similarly, ACSI recently found that wireless consumer satisfaction remains strong and has increased substantially since 2004.<sup>272</sup> Consumer Reports’ January 2011

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<sup>269</sup> *Id.*

<sup>270</sup> The *Fifteenth Report* describes churn as the percentage of current customers an operator loses over a given period of time. Wireless carriers express churn as a percent of their customers per month. The *Fifteenth Report* noted that churn among postpaid customers had been decreasing for a number of years, but showed a slight uptick during the first three quarters of 2009, and that the nationwide carriers had a monthly average churn of just over 2 percent in the fourth quarter of 2009. *Fifteenth Report*, 26 FCC Rcd at 9817-18 ¶¶ 260-1. CTIA’s 2010 year-end results reflect that this figure has decreased, with average monthly churn for postpaid customers among responding companies being 1.97 percent, or 1.74 percent, depending on the methodology used. *See* CTIA 2010 WIRELESS INDUSTRY INDICES at 79, 81.

<sup>271</sup> *See* JOHN HARRIGAN & ELLEN SATTERWHITE, AMERICANS’ PERSPECTIVES ON ONLINE COLLECTION SPEEDS FOR HOME AND MOBILE DEVICES 4, Exhibit 2 (June 1, 2010), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-298516A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-298516A1.pdf); *see also* *Fifteenth Report*, 26 FCC Rcd at 9803 ¶ 224 (stating that “[o]verall, 87 percent of users are at least somewhat satisfied with the coverage of their signal.”). Verizon Wireless has raised significant concerns regarding many other aspects of this survey. *See* Reply Comments of Verizon Wireless, WT Docket No. 09-158, at 6-8 & Attachment (filed July 19, 2010).

<sup>272</sup> ACSI Wireless Industry Scores.

edition observed that four out of five conventional contract providers scored between 69 (“fairly well satisfied”) and 82 (“very satisfied”) – an improvement over the previous year.<sup>273</sup>

Verizon Wireless is extremely proud of the recognition it has received for customer satisfaction. For example, Verizon Wireless topped the 2011 ACSI survey for the eighth consecutive year, and was named one of two “best choice[s] overall” among wireless service providers by Consumer Reports, having “an edge in voice service overall.”<sup>274</sup> The company ranked best for network satisfaction for the second year in a row in the Harris Poll EquiTrend® study, which measures several components of brand equity among consumers such as trust, consumer connection, and commitment.<sup>275</sup> Verizon Wireless also was named the top wireless operator according to a survey conducted by Left Right research, was identified as the top carrier in 24 markets by RootMetrics™ in the categories of Combined Performance and Data Performance, and was found to be the fastest mobile network of 2011 by PC Magazine.<sup>276</sup>

## **2. The Level of Consumer Complaints Is Minimal**

Based on a review of the Commission’s quarterly reports on informal complaints,<sup>277</sup> wireless complaints registered are extremely low in relation to the total number of wireless subscribers. For example, in 2010, fewer than 73,000 complaints were filed with the Commission from the over 310 million wireless subscribers, a complaint rate of *235 per million*

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<sup>273</sup> See *Best Phones & Plans*, CONSUMER REPORTS, Jan. 2011, at 37 (finding customers with and without contracts from a wide variety of carriers are “fairly well satisfied” to “very satisfied.”).

<sup>274</sup> See ACSI Wireless Industry Scores; see also *Best Phones & Plans*, CONSUMER REPORTS, Jan. 2011 at 36.

<sup>275</sup> Verizon Wireless, Awards & Accolades, <http://aboutus.verizonwireless.com/awards2011.html> (last visited Dec. 1, 2011).

<sup>276</sup> Verizon Wireless, Awards & Accolades, <http://aboutus.vzw.com/awards.html> (last visited Nov. 17, 2011).

<sup>277</sup> See generally FCC, Quarterly Reports – Customer Inquiries and Complaints, <http://www.fcc.gov/encyclopedia/quarterly-reports-consumer-inquiries-and-complaints> (last visited Dec. 5, 2011) (providing FCC Quarterly Reports of Consumer Inquiries and Complaints for 2002 through fourth quarter 2010).

customers or 0.02 percent.<sup>278</sup> While the number of complaints rose slightly in 2010 in comparison to previous years, nearly three quarter are Telecommunications Consumer Protection Act (“TCPA”) complaints relating to telemarketers or spam, not complaints about actions of the carriers themselves.<sup>279</sup> When TCPA-related complaints are excluded, the industry’s complaint rate is less than one-third of the total counted for 2010. Seen another way, if TCPA-related complaints are excluded, the industry complaint rate has declined by almost one-half from 37,561 in 2004 to 19,853 in 2010, while the number of subscribers has risen dramatically from 182 million to more than 310 million.<sup>280</sup>

### **3. Consumer Satisfaction Is Underscored by Low Churn Despite Low Barriers to Switching**

Because customer satisfaction affects customer churn, and surveys are showing strong customer satisfaction, it is no surprise that churn has trended downward over the past several years – even though subscribers who wish to switch providers can do so easily in today’s market.

Based on the Commission’s own figures, the nationwide carriers averaged a monthly churn rate of just over 2 percent in the fourth quarter of 2009 compared to 2.8 percent eight years

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<sup>278</sup> See FCC, Quarterly Reports – Customer Inquiries and Complaints, <http://www.fcc.gov/encyclopedia/quarterly-reports-consumer-inquiries-and-complaints> (last visited Dec. 5, 2011) (reporting the number of complaints related to wireless telecommunications for each quarter of 2010 for a total of 72,334). The number of subscribers at the end of 2010 was estimated based on survey results from CTIA’s Semi-Annual Wireless Industry Survey. See CTIA, ANNUALIZED WIRELESS INDUSTRY SURVEY RESULTS – DECEMBER 1985 TO JUNE 2011 4, [http://files.ctia.org/pdf/CTIA\\_Survey\\_MY\\_2011\\_Graphics.pdf](http://files.ctia.org/pdf/CTIA_Survey_MY_2011_Graphics.pdf) (estimating the number of wireless connections to be about 310.997 million as of year-end 2010) (“CTIA ANNUALIZED WIRELESS INDUSTRY SURVEY RESULTS”).

<sup>279</sup> See FCC, Quarterly Reports on Informal Consumer Inquiries and Complaints for Year 2010, <http://www.fcc.gov/cgb/quarter/welcome.html> (last visited Dec. 5, 2011) (reporting the number of complaints related to TCPA for each quarter of 2010 for a total of more than 52,000 complaints).

<sup>280</sup> Compare *id.* (reporting 28,732 complaints for 2004 and 19,853 complaints for 2010, excluding TCPA-related complaints) with CTIA ANNUALIZED WIRELESS INDUSTRY SURVEY RESULTS 4 (estimating about 182 million wireless connections for 2004 and 310 million for 2010).

earlier.<sup>281</sup> One analyst found the weighted industry average to be 1.8 percent through the first half of 2011.<sup>282</sup> The following chart further demonstrates low churn rates:

	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11
<b>National Operators</b>													
AT&T Mobility	1.6%	1.7%	1.7%	1.6%	1.5%	1.4%	1.4%	1.3%	1.3%	1.3%	1.3%	1.4%	1.4%
Sprint Nextel	2.1%	2.2%	2.2%	2.2%	2.1%	2.5%	2.4%	2.8%	2.6%	2.5%	2.4%	2.3%	2.2%
T-Mobile	2.7%	3.0%	3.3%	3.1%	3.1%	3.4%	3.3%	3.1%	3.4%	3.4%	3.6%	3.4%	3.3%
Verizon Wireless	1.2%	1.4%	1.5%	1.4%	1.3%	1.5%	1.4%	1.4%	1.3%	1.4%	1.3%	1.3%	1.3%
National Average (Weighted)	1.9%	2.0%	2.1%	1.9%	1.7%	1.9%	1.8%	1.8%	1.8%	1.8%	1.8%	1.7%	1.7%
<b>Other Operators</b>													
Centennial Cellular	2.0%	2.7%	2.5%	2.2%	2.2%	2.8%	NAV						
Centennial PCS	2.5%	2.6%	2.8%	2.9%	2.9%	3.3%	NAV						
Cincinnati Bell	3.7%	4.0%	4.4%	3.5%	3.2%	3.5%	3.4%	3.3%	3.4%	3.5%	3.4%	3.4%	3.5%
Leap Wireless (Cricket)	3.9%	4.3%	3.9%	3.3%	4.4%	5.4%	4.7%	4.5%	5.0%	5.5%	4.0%	3.1%	4.2%
Metro PCS	4.5%	4.8%	5.1%	5.0%	5.8%	5.8%	5.3%	3.7%	3.3%	3.8%	3.5%	3.1%	3.9%
NTELOS	2.5%	3.1%	3.2%	3.1%	3.0%	3.6%	3.4%	3.1%	3.0%	3.4%	3.5%	3.5%	3.3%
US Cellular	1.9%	2.1%	2.0%	1.9%	2.2%	2.2%	2.1%	1.9%	1.9%	2.1%	2.0%	1.8%	1.8%
<b>Other Weighted Avg.</b>	<b>2.9%</b>	<b>3.3%</b>	<b>3.4%</b>	<b>3.2%</b>	<b>3.8%</b>	<b>4.1%</b>	<b>3.8%</b>	<b>3.2%</b>	<b>3.2%</b>	<b>3.5%</b>	<b>3.0%</b>	<b>2.6%</b>	<b>3.2%</b>
<b>Industry Weighted Avg.</b>	<b>1.9%</b>	<b>2.1%</b>	<b>2.1%</b>	<b>2.0%</b>	<b>1.9%</b>	<b>2.1%</b>	<b>2.0%</b>	<b>1.9%</b>	<b>1.9%</b>	<b>1.9%</b>	<b>1.9%</b>	<b>1.8%</b>	<b>1.8%</b>

Source: UBS Investment Research, US Wireless 411 at 17, Table 15 (Aug. 17, 2011).

The *Fifteenth Report* seems to view churn as a proxy for measuring whether consumer switching costs are detrimental to wireless competition, suggesting that low churn is caused by high barriers to switching.<sup>283</sup> The evidence indicates otherwise.

First, the local number portability regime demonstrably supports customers' ability to easily migrate from one carrier to another. The wireless-to-wireless porting process is very user-friendly, as the wireless industry has implemented streamlined procedures to complete the vast

<sup>281</sup> Compare *Fifteenth Report*, 26 FCC Rcd at 9817-18 ¶ 261 with *Thirteenth Report*, 24 FCC Rcd at 6271 ¶ 181.

<sup>282</sup> UBS WIRELESS 411 REPORT at 17, tbl.15.

<sup>283</sup> See *Fifteenth Report*, 26 FCC Rcd at 9817 ¶ 260. This issue is examined further below. See *infra* Section V.D.1.

majority of ports within a matter of hours.<sup>284</sup> Wireless-to-wireless number porting has taken hold in the marketplace, as utilization has increased each year since it was first introduced in late 2003.<sup>285</sup> Since then, wireless customers have ported more than 78 million telephone numbers to new wireless carriers.<sup>286</sup> According to the FCC's most recent data, almost 16 million wireless customers ported their numbers to a new wireless carrier in 2009, and almost 4 million wireless customers ported their numbers to other wireless carriers during the first quarter of 2010.<sup>287</sup>

Second, the churn information reflects that contract terms such as Early Termination Fees (“ETFs”) are not a barrier to switching. The Commission uses churn figures to calculate “subscriber lifetime” for the wireless industry, defined as the number of months an average subscriber is expected to remain a customer of a particular provider.<sup>288</sup> The average subscriber lifetime for the four national carriers has ranged recently between 52 and 55 months, with Verizon Wireless having the longest subscriber lifetimes.<sup>289</sup> Thus, customers have multiple opportunities to switch carriers and yet choose not to do so even if they are not subject to an ETF.

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<sup>284</sup> For purposes of comparison, the Commission adopted rules in 2009 requiring completion of simple wireline-to-wireline and simple intermodal port requests within one business day, reducing the four-business day porting interval that had earlier been imposed. *See Local Number Portability Porting Interval and Validation Requirements, Report and Order and Further Notice of Proposed Rulemaking*, 24 FCC Rcd 6084 ¶ 1 (2009). However, disputes among wireline and other providers as to how porting would work led the Commission to act a year later to standardize the data to be exchanged. *See Local Number Portability Porting Interval and Validation Requirements, Report and Order*, 25 FCC Rcd 6953, 6954 ¶ 1(2010) (standardizing the data to be exchanged when transferring a customer's telephone number between a wireline and wireless provider, two wireline providers, or an interconnected Voice over Internet Protocol (VoIP) provider and any other service provider).

<sup>285</sup> *See* 47 C.F.R. § 52.31 (2009) (setting forth the rules governing wireless number portability).

<sup>286</sup> *See* CRAIG STROUP & JOHN VU, FCC, NUMBERING RESOURCE UTILIZATION IN THE UNITED STATES 2 (Jan.2011), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-303900A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-303900A1.pdf).

<sup>287</sup> *Id.* at 36.

<sup>288</sup> *See Fifteenth Report*, 26 FCC Rcd at 9819 ¶ 263.

<sup>289</sup> *See id.* at 9820 ¶ 263, tbl.25.

Indeed, the wireless industry offers consumers many choices for services and plans, including prepaid service options, month-to-month postpaid contracts, and postpaid contracts with an ETF. While term contracts with ETFs provide customers with the ability to obtain wireless devices at substantial discounts from their full retail price,<sup>290</sup> multiple alternatives are available for customers who wish to avoid ETFs, including prepaid plans. In fact, the growth of prepaid subscribers as a percentage of the wireless marketplace<sup>291</sup> has further served to reduce the barriers to switching carriers.

Finally, carriers themselves offer incentive programs to reduce the costs associated with switching. For example, U.S. Cellular offers a trade-in program allowing customers and non-customers to trade in their existing phones or tablets for up to \$150 cash.<sup>292</sup> Verizon Wireless has a similar trade-in program that allows subscribers of other carriers to trade in their phones to switch to Verizon Wireless, in exchange for which the subscriber receives value that can reduce, or even fully offset the ETF assessed by the other carrier.<sup>293</sup>

In short, low churn is the result of carriers' commitment to consumers, as demonstrated by customer satisfaction and minimal complaints, rather than alleged barriers to switching. In fact, marketplace trends suggest continued lowering of barriers to switching as the industry evolves.

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<sup>290</sup> By reducing up-front costs to consumers, this pricing structure enables many more customers to access a range of state-of-the-art broadband services and capabilities.

<sup>291</sup> US WIRELESS 411 at 4, tbl.2 (reflecting an increase in unlimited and traditional prepaid subscribers as percentage of market from 17.9 percent in the first quarter of 2009, to 21.7 percent in the fourth quarter of 2011 (estimated)).

<sup>292</sup> U.S. Cellular, Trade-In Program, <http://uscellular.cexchange.com/online/home/index.rails> (last visited Nov. 20, 2011).

<sup>293</sup> Verizon Wireless, Device Trade In Program, <https://videos.verizonwireless.com/Device-Trade-In-Program/v/I7X0VUVA#transcript> (last visited Nov. 17, 2011).

### **III. THE MARKET SEGMENTS FOR DEVICES, APPLICATIONS, AND CONTENT ARE DRIVING COMPETITION IN THE MOBILE ECOSYSTEM**

#### **A. The Wireless Device Market Is an Increasingly Important Component of Consumer Choice**

Today's wireless devices are impressive, powerful computing devices. They offer virtually limitless versatility and enable the user to access and create innovative content and applications. They are an unprecedented source of personalization in the communications industry. And consumers are intensely enthusiastic about them. That personal attachment has elevated device manufacturers to powerful positions within the mobile ecosystem.

Consumers increasingly focus on the device when making wireless service purchasing decisions. In a mid-2010 survey, 86 percent of the respondents who planned to buy a smartphone in the next 90 days reported that they had already chosen a particular brand.<sup>294</sup> A 2010 Consumer Reports study found that 38 percent of consumers who switched wireless providers did so "to get the phone they wanted," and that "27 percent of all respondents went shopping with a specific phone in mind."<sup>295</sup> As noted above, in this environment carriers, manufacturers, application developers, content providers, and other participants in the wireless ecosystem both compete and collaborate to design, manufacture, and distribute devices consumers desire.

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<sup>294</sup> See Jean Crumrine & Paul Carton, *Explosive Changes in Consumer Demand Shake Up Smart Phone Industry*, CHANGEWAVE RESEARCH, July 14, 2010, [http://www.changewaveresearch.com/articles/2010/07/smart\\_phones\\_20100714.html](http://www.changewaveresearch.com/articles/2010/07/smart_phones_20100714.html).

<sup>295</sup> See Consumer Reports, *Best Cell-Phone Service*, CONSUMER REPORTS MAGAZINE: JANUARY 2010, <http://www.consumerreports.org/cro/magazine-archive/2010/january/electronics-computers/cell-phone-service/overview/cell-phone-service-ov.htm>; see also MARK LOWENSTEIN, THE EVOLVING ROLE OF HANDSETS IN THE U.S. WIRELESS INDUSTRY 6 (Jan. 2009) ("[T]he wireless device has moved more to the center stage as an important part of the operator's retail marketing and the consumer's purchasing decision."), *attached to* Comments of Verizon Wireless, RM-11497 (filed Feb. 2, 2009) ("Verizon Wireless Handset Exclusivity Comments").

Products in the wireless marketplace are offered to the consumer in a wide variety of ways. A device might be sold to a consumer by any of the multitude of mobile service providers in the U.S., by a device manufacturer such as Apple or Samsung, a content provider such as Amazon or Barnes & Noble, or even a search engine provider such as Google. Any one of these players might sell their product directly to the consumer. The device might use an operating system developed by the manufacturer (*e.g.*, RIM Blackberry OS), by an open consortium (*e.g.*, Android), or by a software company (*e.g.*, Windows Phone 7 OS). The device might be attractive for its utility and design, or for the large number of third-party applications that can ride on it. And the device might be purchased with an option to include a traditional wireless service plan or not, like the iPad. Other devices might be WiFi-only, such as the Amazon Kindle Fire. As discussed below, this WiFi-only phenomenon is especially noteworthy: Approximately 85 percent of the fastest growing device segment – tablets – are WiFi-only.<sup>296</sup> It is a stark example of the increasingly competitive wireless broadband marketplace.

### **1. The Manufacturer Market Is Large and Growing, with Ever-Shifting Market Shares**

The U.S. market for wireless devices is characterized by significant competition among a large and growing number of manufacturers. In the core handset market, there are more than thirty-two different manufacturers,<sup>297</sup> including Apple, HTC, Kyocera, LG, Motorola, Nokia, Research in Motion (or “RIM”), Samsung, Sanyo, and Sony Ericsson. In 2010 and 2011, other major companies, including Dell, Amazon, and Facebook, have begun developing their own

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<sup>296</sup> US WIRELESS DATA MARKET UPDATE Q2 2011 at 6.

<sup>297</sup> See *CTIA Wireless Industry Overview* at 13.

smartphones.<sup>298</sup> In this competitive marketplace, manufacturers face few if any impediments to entering the market or growing market share by offering devices that satisfy consumer demand. No single manufacturer or service provider has sufficient market power to control the wholesale or retail distribution chain or prevent another manufacturer from working with particular service providers. Moreover, device manufacturers are completely independent from service providers, as no wireless service provider in the U.S. manufactures wireless devices itself or owns equity in any of the major handset manufacturers.<sup>299</sup>

Market trends further illustrate the vigorous competition in this segment. In the past year alone, significant shifts in market share have occurred among manufacturers. Specifically, according to data published by comScore, from January 2010 through September 2011, Motorola dropped from the top mobile original equipment manufacturer (“OEM”) to number three, while Samsung vaulted from number three to the number one slot.<sup>300</sup> Likewise, Nokia fell out of the top five, and Apple overtook RIM to become the fourth largest mobile phone OEM.<sup>301</sup>

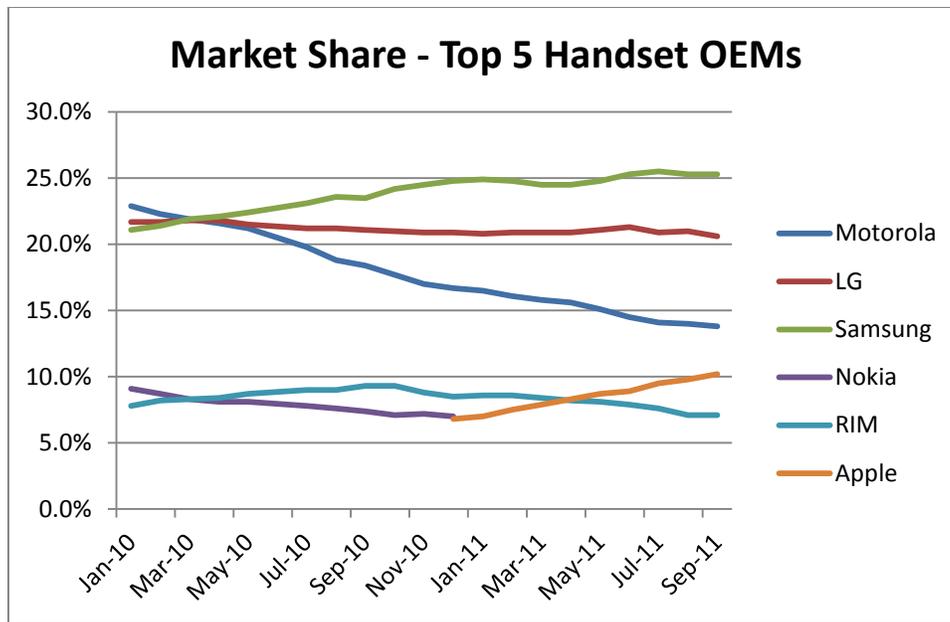
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<sup>298</sup> See Press Release, Dell Inc., Dell Announces U.S. Smart Phone Deal with AT&T (Jan. 6, 2010), <http://content.dell.com/us/en/corp/d/press-releases/2010-01-06-dell-att-smart-phone-deal.aspx>; Liviu Anca, *Analysts Expecting Android-Powered Amazon Smartphone in Q4 2012*, GEEK SAILOR, Nov. 22, 2011, <http://www.geeksailor.com/amazon-smartphone/>; Liz Gannes and Ina Fried, *The Facebook Phone: It's Finally Real and Its Name is Buffy*, ALLTHINGSID, Nov. 21, 2011, <http://allthingsid.com/2011/11/21/the-facebook-phone-its-finally-real-and-its-name-is-buffy/>.

<sup>299</sup> See Verizon Wireless Handset Exclusivity Comments at 12.

<sup>300</sup> See Press Release, comScore, Inc., comScore Reports December 2009 U.S. Mobile Subscriber Market Share, (Feb. 8, 2010), [http://www.comscore.com/Press\\_Events/Press\\_Releases/2010/2/comScore\\_Reports\\_December\\_2009\\_U.S.\\_Mobile\\_Subscriber\\_Market\\_Share](http://www.comscore.com/Press_Events/Press_Releases/2010/2/comScore_Reports_December_2009_U.S._Mobile_Subscriber_Market_Share); Press Release, comScore, Inc., comScore Reports May 2010 U.S. Mobile Subscriber Market Share, (July 8, 2010), [http://www.comscore.com/Press\\_Events/Press\\_Releases/2010/7/comScore\\_Reports\\_May\\_2010\\_U.S.\\_Mobile\\_Subscriber\\_Market\\_Share](http://www.comscore.com/Press_Events/Press_Releases/2010/7/comScore_Reports_May_2010_U.S._Mobile_Subscriber_Market_Share).

<sup>301</sup> See *supra* n.300.



Source: comScore, Inc.<sup>302</sup>

There is also very little vertical integration in today’s wireless ecosystem, as device manufacturers typically distribute their equipment broadly to multiple wireless service providers and vendors.<sup>303</sup> For example, a review of handset availability for various manufacturers shows that RIM distributes its products through at least thirty-four U.S. carriers or vendors,<sup>304</sup> Kyocera through at least fifteen,<sup>305</sup> Samsung through at least fifteen,<sup>306</sup> Motorola through at least six,<sup>307</sup>

<sup>302</sup> The information in this chart was compiled from data, research opinion or viewpoints published by comScore in its “U.S. Mobile Subscriber Market Share” press releases from March 10, 2010 until November 4, 2011. See comScore, Inc., Press Releases, [http://www.comscore.com/Press\\_Events/Press\\_Releases](http://www.comscore.com/Press_Events/Press_Releases) (last visited Dec. 1, 2011).

<sup>303</sup> See Verizon Wireless Handset Exclusivity Comments at 13.

<sup>304</sup> See Research In Motion Limited, Buy BlackBerry Devices, Accessories & Software, <http://us.blackberry.com/where-to-buy/> (last visited Nov. 22, 2011) (Click on “Select a carrier” to see a list of carriers through which RIM products can be purchased).

<sup>305</sup> See Kyocera, Phones, <http://kyocera-wireless.com/phones/all.cfm> (last visited Nov. 22, 2011) (Click on each handset model, then click on “where to buy” for a list of wireless service providers for that particular device).

<sup>306</sup> See Samsung, All Cell Phones, <http://www.samsung.com/us/mobile/cell-phones/all-products> (last visited Nov. 22, 2011) (Click on each handset model, then click on “Shop” for a list of wireless service providers for that particular device).

and Apple through five.<sup>308</sup> On its website, Verizon Wireless offers consumers more than 100 device choices. These include feature phones, smartphones, push-to-talk phones, tablets, netbooks, and modems/PC cards from a wide range of manufacturers, such as Apple, Casio, Compaq, HP, HTC, LG, Motorola, Palm, Pantech, Samsung, Sony Ericsson, and RIM. Moreover, as discussed below, more and more cutting-edge devices are being offered over numerous providers' networks, indicating a decline in so-called "exclusivity arrangements."

Amidst such competition, there are few, if any, impediments to prospective entrants. In the past year, for example, Google worked with HTC and Samsung to develop and release three unlocked, Google-branded devices, the Nexus One (which Google initially offered directly to consumers from a web store), the Nexus S (sold at Best Buy and by all major carriers), and the Galaxy Nexus (release details pending).<sup>309</sup> Computer manufacturer Dell released its first Android-based smartphone, the Dell Aero (formerly the Mini 3).<sup>310</sup> Additionally, Garmin, a GPS-based navigation device maker, partnered with ASUS, a computer manufacturer, to sell the pair's first smartphone in the U.S. through AT&T in October 2009 and its second smartphone

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<sup>307</sup> See Motorola, Mobile Phones, <http://www.motorola.com/Consumers/US-EN/Consumer-Product-and-Services/Mobile-Phones/> (last visited Nov. 22, 2011).

<sup>308</sup> See Apple Inc., Where to Buy iPhone, <http://www.apple.com/iphone/buy/> (last visited Nov. 22, 2011).

<sup>309</sup> See Press Release, Google, Google Offers New Model for Consumers to Buy a Mobile Phone (Jan. 5, 2010), [http://www.google.com/intl/en/press/pressrel/20100105\\_phone.html](http://www.google.com/intl/en/press/pressrel/20100105_phone.html); Andy Rubin, *Introducing Nexus S with Gingerbread*, GOOGLE BLOG, Dec. 6, 2010, <http://googleblog.blogspot.com/2010/12/introducing-nexus-s-with-gingerbread.html>; Press Release, Samsung, Samsung and Google Introduce GALAXY Nexus (Oct. 19, 2011), <http://www.samsungmobilepress.com/2011/10/19/Samsung-and-Google-introduce-GALAXY-Nexus>.

<sup>310</sup> See AT&T, Introducing the Dell Aero Smartphone, <http://www.wireless.att.com/cell-phone-service/cell-phone-sales/promotion/ero.jsp?status=success&requestid=130954&ref=dynamitedata.com> (last visited Dec. 1, 2011); Press Release, Dell Inc., Dell Announces U.S. Smart Phone Deal with AT&T (Jan. 6, 2010), <http://content.dell.com/us/en/corp/d/press-releases/2010-01-06-dell-att-smart-phone-deal.aspx>.

through T-Mobile in June 2010.<sup>311</sup> New entrants continue to emerge: analysts are reporting that Amazon is planning to launch a smartphone in 4Q 2012, and would likely sell the device at cost, relying on additional revenues from phone-based sales of Amazon merchandise.<sup>312</sup>

Expanding beyond the cell phone and smartphone, the number of manufacturers competing in the wireless broadband device space is staggering. To take just one example, at the January 2011 Consumer Electronics Show, more than 70 new tablet models were introduced by at least 41 manufacturers.<sup>313</sup> This broader wireless ecosystem includes practically every consumer electronics manufacturer and technology company.

The large number of existing market participants and constant entry by new participants are evidence that the marketplace is sufficiently fluid and competitive to allow new entrants to effectively compete with the many existing wireless ecosystem participants.

## **2. The Operating System Segment Is Producing Immense Innovation and Choice**

The operating system (“OS”) is one of the primary ways devices manufacturers differentiate themselves, and it increasingly is the driving factor in consumers’ choice of device, as users seek to acquire a device with certain capabilities or an array of applications. Today, the two most prevalent operating systems for smartphones and other high-end devices are Google’s

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<sup>311</sup> See Brian James Kirk, *AT&T to Offer Garmin-ASUS Nuvifone G60 Touchscreen Navigation Phone This Weekend*, MOBILEBURN.COM, Sep. 29, 2009, <http://www.mobileburn.com/news.jsp?Id=7914>; Todd Haselton, *T-Mobile Garminfone Set to Launch in June for \$199.99*, MOBILEBURN.COM, May 11, 2010, <http://www.mobileburn.com/news.jsp?Id=9417>.

<sup>312</sup> See Peter Kafka, *Amazon KindlePhone for 2012?*, ALLTHINGS.D, Nov. 17, 2011, <http://allthingsd.com/20111117/amazon-kindlephone-for-2012/>; Agustino Fontevicchia, *Jeff Bezos Eyeing Apple’s Lunch? Amazon Smartphone in 2012, Citi Says*, FORBES, Nov. 17, 2011, <http://www.forbes.com/sites/afontevicchia/2011/11/17/jeff-bezos-eyeing-apples-lunch-amazon-smartphone-in-2012-citi-says/>.

<sup>313</sup> See Shawn Dubravac, *2011 CES Tablets*, TWO OPINIONS, Jan. 21, 2011, <http://www.shawndubravac.com/2011/01/2011ces-tablets>; Lance Ulanoff, *CES 2011: Five Essential Trends*, PCMAG.COM, Jan. 9, 2011, <http://www.pcmag.com/article2/0,2817,2375495,00.asp>.

Android OS, which is used in numerous manufacturers' handsets, tablets, e-readers, and other devices, and Apple's iOS, which is used in Apple iPhones and iPads. These operating systems have been around for only about four years. Microsoft, which has offered a succession of mobile-specific versions of its Windows OS for over a decade, is seeking a growing proportion of the market with the re-invigorated and critically acclaimed Windows Phone 7 OS; Nokia and Microsoft announced a broad strategic partnership centered around Windows Phone 7, which Nokia will use in its new smartphones.<sup>314</sup> Other OSs currently in use include Research in Motion's BlackBerry OS and its newer Playbook/QNX OS.

Some other operating systems are on the wane. For example, "[a]s Nokia internalizes the OS, completes the closure of the Symbian Foundation, and shifts the OS away from being a multipurpose platform for licensing to others to become an internal software tool, Symbian will increasingly resemble a super featurephone platform."<sup>315</sup> Hewlett-Packard recently announced that it was discontinuing development of another competitor, webOS, which had originally been developed by Palm.<sup>316</sup>

The rapid fluctuations in market share of various smartphone OSs is displayed in the chart below. The meteoric growth of Android's market share is one of the dramatic stories of

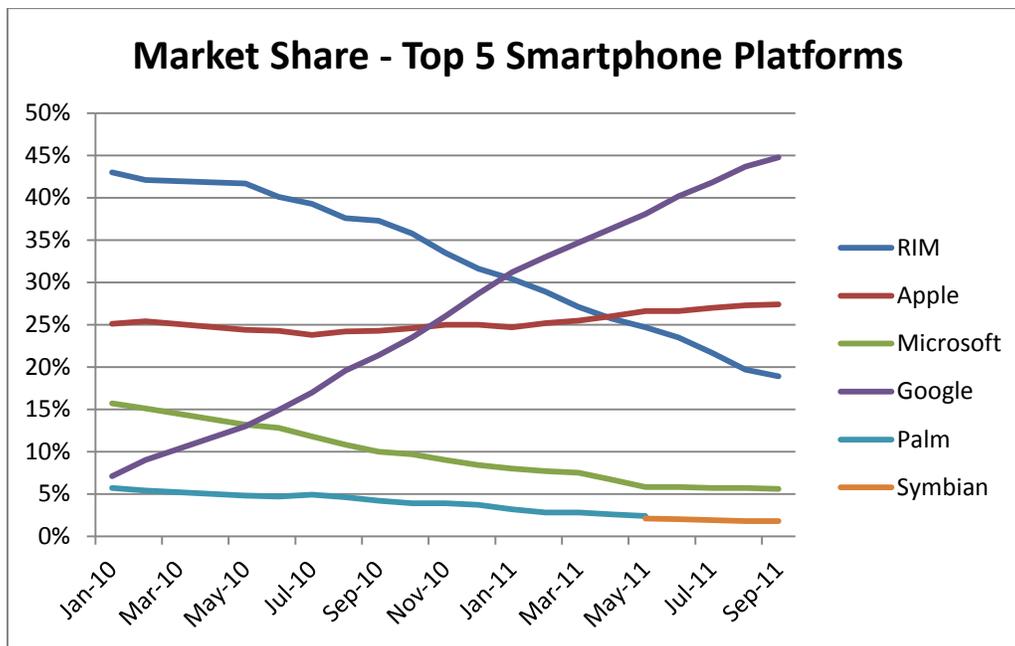
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<sup>314</sup> Brad Molen, *Windows Phone 7.5 Mango Review*, ENGADGET, Sep. 27, 2011, <http://www.engadget.com/2011/09/27/windows-phone-7-5-mango-review/> ("With [the latest version of the OS], WP7 has caught up with Android and iOS in nearly every way, and in some areas it's even surpassed the other two in functionality."); Press Release, Microsoft Inc., *Nokia and Microsoft Announce Plans for a Broad Strategic Partnership to Build a New Global Ecosystem* (Feb. 11, 2011), <http://www.microsoft.com/presspass/press/2011/feb11/02-11partnership.mspx>.

<sup>315</sup> FORRESTER RESEARCH, INC., *SMARTPHONE TRENDS 2011 6* (Jan 27, 2011).

<sup>316</sup> HP has announced the discontinuance of its own development of webOS products, but it is not yet clear whether the company will sell webOS, license it to others, or terminate it altogether. See Nicholas Kolakowski, *HP's webOS Decision Could Affect Oracle, Amazon, Microsoft*, EWEEK, Nov. 9, 2011, <http://www.eweek.com/c/a/Mobile-and-Wireless/HPs-WebOS-Decision-Could-Affect-Oracle-Amazon-Microsoft-114304/>.

2010. Android went from a 7 percent market share in early 2010 to the leading position in the marketplace today, with nearly 45 percent of consumers reporting that they use an Android-based device. In June of this year, Google Android chief Andy Rubin stated that over 500,000 Android devices were being activated per day around the world, and noted that activations were growing 4.4 percent week-over-week.<sup>317</sup> As an open-source operating system, the Android platform actually has a wide number of variations, with handset manufacturers frequently customizing the OS to differentiate their phones.



Source: comScore, Inc.<sup>318</sup>

<sup>317</sup> Andy Rubin, Twitter Status, <http://twitter.com/#!/arubin/status/85660213478309888> (last visited Nov. 23, 2011).

<sup>318</sup> The information in this chart was compiled from data, research opinion or viewpoints published by comScore in its “U.S. Mobile Subscriber Market Share” press releases from March 10, 2010 until November 4, 2011. See comScore, Inc., Press Releases, [http://www.comscore.com/Press\\_Events/Press\\_Releases](http://www.comscore.com/Press_Events/Press_Releases) (last visited Dec. 1, 2011).

### 3. The Device Market Is Remarkably Diverse and Expanding

In 2011, for the first time ever, there were more wireless devices (322.9 million) than persons living in the United States and its territories (315.5 million).<sup>319</sup> The device market is remarkably diverse and includes smartphones, tablets, USB modems, mobile hotspots, and other connected devices.

**Smartphones.** Smartphones, or devices that offer advanced computing capabilities and connectivity, continue to be the fastest-growing segment of the competitive worldwide device market.<sup>320</sup> U.S. carriers report that the number of smartphones and wireless-enabled PDAs on their networks as of December 2010 was 78.2 million, up 57 percent from 49.8 million as of December 2009.<sup>321</sup> In 2010, for the first time, unit shipments of smartphones surpassed those for traditional desktop, laptop, and netbooks.<sup>322</sup>

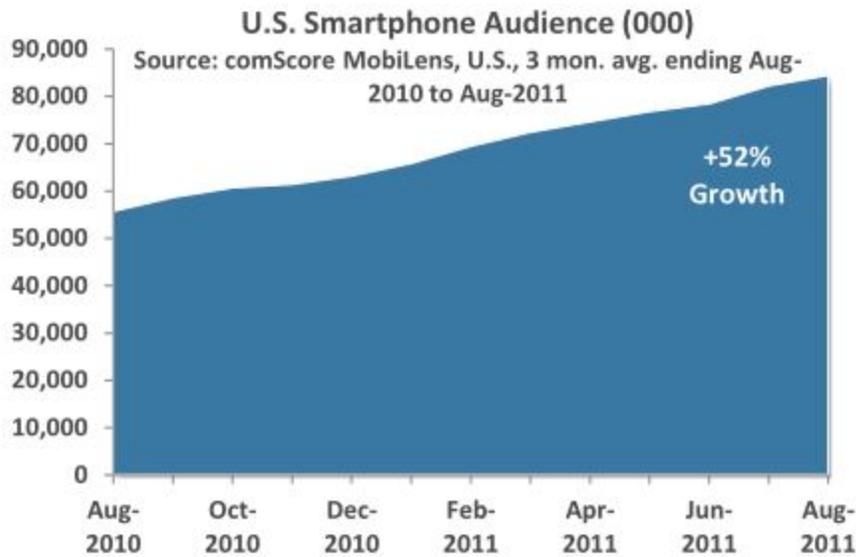
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<sup>319</sup> Robert Roche, *CTIA Survey Data Shows More Wireless Devices Than Americans*, CTIA: THE WIRELESS ASSOCIATION® BLOG, Oct. 11, 2011, <http://blog.ctia.org/2011/10/11/ctia-survey-show-more-wireless-devices-than-americans/>.

<sup>320</sup> *Smartphone, Fastest Growing Segment in Mobile Devices*, THE FINANCIAL EXPRESS, Nov. 13, 2009, <http://www.financialexpress.com/news/smartphone-fastest-growing-segment-in-mobile-devices/540758>.

<sup>321</sup> CTIA 2010 WIRELESS INDUSTRY INDICES at 11.

<sup>322</sup> CHETAN SHARMA, CHETAN SHARMA CONSULTING, US WIRELESS DATA MARKET - Q4 2010 AND 2010 UPDATE at 2 (Feb. 2011).



Source: comScore Inc.<sup>323</sup>

With growing U.S. consumer demand for smartphones, manufacturers are bringing innovative devices to market faster than ever before.<sup>324</sup> One analyst calculated that between April 2010 and March 2011, more than 120 new smartphone models were introduced in the U.S.<sup>325</sup> These devices are not run-of-the-mill copycats, either – most are highly innovative and differentiated. As an example of the rapidity with which innovative devices are being deployed, in February 2010 Sprint Nextel introduced the first 4G smartphone, the HTC EVO 4G. By June

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<sup>323</sup> COMSCORE, INC., DIGITAL OMNIVORES: HOW TABLETS, SMARTPHONES AND CONNECTED DEVICES ARE CHANGING U.S. DIGITAL MEDIA CONSUMPTION HABITS 14 (Oct. 10, 2011), [http://www.comscore.com/Press\\_Events/Presentations\\_Whitepapers/2011/Digital\\_Omnivores](http://www.comscore.com/Press_Events/Presentations_Whitepapers/2011/Digital_Omnivores).

<sup>324</sup> MANAGING THE GROWTH AND PROFITS OF CONNECTED DEVICES at 3 (“Similarly, on the device front, the average replacement cycles have decreased from over 24 months to less than 12 months in many mobile markets and demographic segments.”).

<sup>325</sup> See CTIA *Wireless Industry Overview* at 13.

2011, manufacturers had introduced eighteen more new 4G smartphone models.<sup>326</sup> Other advanced and innovative smartphones introduced during 2010 and 2011 include:

- The Apple iPhone 4S, launched on Oct. 4, 2011, introduces Siri, an artificial intelligence utility. Uniquely for an Apple handset, the device is available from four different carriers: AT&T, Verizon, Sprint Nextel, and C Spire.<sup>327</sup>
- Over 50 Android smartphones were scheduled for release in 2011, and most carriers – including even the smallest carriers – offer one or more to their subscribers. The Samsung Galaxy S, one of the most hotly anticipated Android phone releases of 2010, debuted under different names on five different carriers: AT&T (as the “Captivate”), Sprint Nextel (as the “Epic 4G”), T-Mobile (as the “Vibrant”), Verizon (as the “Fascinate”) and U.S. Cellular (as the “Mesmerize”).<sup>328</sup>
- Many of the most popular Android phones are available to smaller carriers as well. For example, the Samsung Galaxy S II, first introduced in the U.S. by Alaskan regional carrier GCI, is also available from smaller carriers such as Immix Wireless,<sup>329</sup> as well as from Sprint Nextel, T-Mobile, and AT&T.<sup>330</sup>
- Sonim specializes in hardened phones for industrial and business applications. Its latest U.S. release, the XP3400 Armor, is sold by the Associated Carrier Group, a collection of 30 smaller carriers including C Spire, Alltel, and Carolina West Wireless.<sup>331</sup>

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<sup>326</sup> See CTIA *Wireless Industry Overview* at 12.

<sup>327</sup> Press Release, Apple, Apple Launches iPhone 4S, iOS 5 & iCloud (Oct. 4, 2011), <http://www.apple.com/pr/library/2011/10/04Apple-Launches-iPhone-4S-iOS-5-iCloud.html>; Eric Slivka, *C Spire Launching iPhone on November 11<sup>th</sup>, ‘Unlimited’ Non-Streaming data and 500 Minutes for \$50*, MACRUMORS.COM, Nov. 1, 2011, <http://www.macrumors.com/2011/11/01/c-spire-launching-iphone-on-november-11th-unlimited-non-streaming-data-and-500-minutes-for-50/>.

<sup>328</sup> See JR Raphael, *Samsung Galaxy S: A Carrier-By-Carrier Guide*, COMPUTERWORLD, Jun. 28, 2010, [http://blogs.computerworld.com/16420/samsung\\_galaxy\\_s](http://blogs.computerworld.com/16420/samsung_galaxy_s); U.S. Cellular, Phone Detail for Samsung Mesmerize™, <http://www.uscellular.com/uscellular/cell-phones/showPhoneDetails.jsp?productId=prod60188> (last visited Nov. 22, 2011).

<sup>329</sup> Immix Wireless, Phones: Samsung Galaxy S 2, <http://www.immix.com/devices/samsung/galaxy-s2.html> (last visited Nov. 22, 2011).

<sup>330</sup> Terrence O’Brien, *Galaxy S II finally lands on American shores for Sprint, T-Mobile and AT&T*, ENGADGET, Aug. 30, 2011, <http://www.engadget.com/2011/08/30/galaxy-s-ii-finally-lands-on-american-shores-for-sprint-t-mobil/>.

<sup>331</sup> Sascha Segan, *Sonim Brings NFC, Push-to-Talk to Indestructible Phones*, Oct. 10, 2011, <http://www.pcmag.com/article2/0,2817,2394433,00.asp>.

- In January 2010 Google launched the Nexus One, Google's first Android-based phone. The unlocked device was designed to be a pure Android phone, without carrier modifications.<sup>332</sup>

Customer sales have mirrored the intense production of new smartphone devices. In Q2 2011, 70 percent of operator postpaid device sales were smartphones, and one analyst believes that by the end of 2011 that number could be closer to 90 percent.<sup>333</sup> Approximately 87.4 million people in the U.S. owned smartphones as of September 2011, up 12 percent from the preceding three month period.<sup>334</sup> Analysts expect year-over-year growth in smartphone ownership to top 50 percent.<sup>335</sup>

**Tablets.** In 2010, tablet computers – an idea that has been introduced repeatedly throughout the history of the computer – finally caught on. In April 2010 Apple launched its iPad tablet and sold 15 million units before December 2010.<sup>336</sup> Apple's ground-breaking success spurred the development of many other similar tablets. Samsung introduced the Galaxy S Tabs in June 2010, and sold approximately 2 million units by the end of the year.<sup>337</sup> And tablets have continued to explode in popularity during 2011. One analysis determined that more than 200

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<sup>332</sup> Google, Google Phone Gallery: Nexus One with Google, <http://www.google.com/phone/detail/nexus-one> (last visited Nov. 22, 2011).

<sup>333</sup> US WIRELESS MARKET UPDATE Q2 2011 at 2.

<sup>334</sup> Press Release, comScore Inc., comScore Reports September 2011 U.S. Mobile Subscriber Market Share (Nov. 4, 2011), [http://www.comscore.com/Press Events/Press Releases/2011/11/comScore Reports September 2011 U.S. Mobile Subscriber Market Share](http://www.comscore.com/Press%20Events/Press%20Releases/2011/11/comScore%20Reports%20September%202011%20U.S.%20Mobile%20Subscriber%20Market%20Share).

<sup>335</sup> Joe Wilcox, *Android growth surge pushes US smartphone OS share above 40%*, BETANEWS, Aug. 4, 2011, <http://betanews.com/2011/08/04/android-growth-surge-pushes-us-smartphone-os-share-above-40/>.

<sup>336</sup> Steveklein, *Steve Jobs reports iPad 2010 sales statistics*, YOUTUBE, Mar. 29, 2011, <http://www.youtube.com/watch?v=osGG9W5VVII>.

<sup>337</sup> MOBILE BROADBAND & MOBILE COMPUTING DEVICES at 35.

new tablet models were slated for release in 2011.<sup>338</sup> Shipments of all tablets are projected to total 62.5 million in 2011.<sup>339</sup> Android-based tablets cut Apple's 94 percent share of tablet shipments to 61 percent in Q2 2011 over the course of a year.<sup>340</sup> In April 2011 RIM released its BlackBerry PlayBook, which runs RIM's own QNX operating system.<sup>341</sup> Hewlett-Packard ("HP") also introduced the webOS-based TouchPad tablet.<sup>342</sup>

As referenced above, an overwhelming majority of tablets sold are not associated with a wireless plan. Approximately 85 percent of tablets are "WiFi only."<sup>343</sup> In many cases, it is the device itself that drives the purchase. Consider Amazon's newly announced Kindle Fire and Barnes & Noble's Nook, neither of which offer 3G connectivity. These relatively inexpensive tablets – hundreds of dollars cheaper than Apple's iPad – are sold by retail companies who see the tablets primarily as a means to sell content (movies, music, ebooks, and the like) to consumers.<sup>344</sup> This unique business model competes with the traditional service provider model and brings additional options to consumers.

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<sup>338</sup> Julianne Pepitone, *102 tablets – but no real iPad rivals yet*, CNNMONEY, Mar. 1, 2011, <http://money.cnn.com/2011/03/01/technology/tabletmania/index.htm?iid=EL>.

<sup>339</sup> Charles Arthur, *Tablet sales will be equivalent to 15% of PC market in 2011, says IDC*, THE GUARDIAN, Sep. 15, 2011, <http://www.guardian.co.uk/technology/2011/sep/15/ipad-tablet-market-2011-forecast>.

<sup>340</sup> Todd, *Android Cuts into Apple's Tablet Dominance*, BLOOMWORLDS, July 23, 2011, <http://blog.bloomworlds.com/2011/07/android-cuts-into-apple%E2%80%99s-tablet-dominance>.

<sup>341</sup> Julianne Pepitone, *RIM PlayBook tablet coming April 19 for \$499*, CNNMONEY, Mar. 22, 2011, [http://money.cnn.com/2011/03/22/technology/rim\\_playbook\\_release\\_date/index.htm](http://money.cnn.com/2011/03/22/technology/rim_playbook_release_date/index.htm).

<sup>342</sup> David Goldman, *HP unveils TouchPad tablet*, CNNMONEY, Feb. 10, 2011, [http://money.cnn.com/2011/02/09/technology/hp\\_webos\\_tablet/index.htm?iid=EL](http://money.cnn.com/2011/02/09/technology/hp_webos_tablet/index.htm?iid=EL).

<sup>343</sup> US WIRELESS DATA MARKET UPDATE Q2 2011 at 6.

<sup>344</sup> Lynnette Luna, *Why the Kindle Fire and Nook Tablet are Wi-Fi only*, FIERCE BROADBAND WIRELESS, Nov. 10, 2011, [http://www.fiercebroadbandwireless.com/story/why-kindle-fire-and-nook-tablet-are-wi-fi-only/2011-11-10?utm\\_medium=nl&utm\\_source=internal](http://www.fiercebroadbandwireless.com/story/why-kindle-fire-and-nook-tablet-are-wi-fi-only/2011-11-10?utm_medium=nl&utm_source=internal).

**USB Modems / MiFi Hot Spots.** USB modems and mobile hotspots are two types of mobile devices that enable other devices such as a computer or a tablet to connect to the Internet. Analysts predict steady growth for USB modems, estimating that 110 million units will ship worldwide in 2011.<sup>345</sup> Analysts also predict the market for MiFi devices, which can simultaneously connect multiple devices to the Internet, will grow by 47 percent globally.<sup>346</sup> Together with wireless modems embedded in devices such as netbooks, the sector is expected to grow 46 percent year over year, offering consumers still more choices.<sup>347</sup>

**Other Connected Devices.** Mobile broadband-connected e-readers, portable media players, and consumer navigation devices are also widely available and increasingly popular. E-readers in particular have experienced rapid growth, with the percentage of U.S. adults owning an e-reader doubling from 6 percent to 12 percent between November 2010 and May 2011.<sup>348</sup> Some advanced e-readers double as tablets, increasing their attractiveness. This growth in connected devices is expected to continue into the future, providing yet another new means for consumers to obtain various information and entertainment.<sup>349</sup>

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<sup>345</sup> Press Release, ABI Research, USB Modems Continue to Outstrip Embedded as Mobile Broadband Modem Shipments Grow to 150 Million in 2011 (Oct. 25, 2011), <http://www.abiresearch.com/press/3801-USB+Modems+Continue+to+Outstrip+Embedded+as+Mobile+Broadband+Modem+Shipments+Grow+to+150+Million+in+2011>.

<sup>346</sup> ANDREW BROWN, STRATEGY ANALYTICS, MOBILE BROADBAND DEVICES FORECAST & ANALYSIS 5, 9 (Nov. 7, 2011), <http://www.strategyanalytics.com/default.aspx?mod=reportabstractviewer&a0=6833>.

<sup>347</sup> MOBILE BROADBAND & MOBILE COMPUTING DEVICES at 37.

<sup>348</sup> KRISTEN PURCELL, PEW INTERNET & AMERICAN LIFE PROJECT, E-READER OWNERSHIP DOUBLES IN SIX MONTHS 2 (June 27, 2011), <http://pewinternet.org/Reports/2011/E-readers-and-tablets.aspx>.

<sup>349</sup> Advanced Television, Shipments of connected devices to exceed PCs in 2013, <http://www.advanced-television.com/index.php/2011/08/10/shipments-of-connected-devices-to-exceed-pcs-in-2013/> (last visited Dec. 3, 2011) (finding that “media tablets will ship more than 300 million units by 2015, 15 times greater than in 2010, for a five-year compound annual growth rate of 73.3 percent”).

***Machine-to-Machine Devices.*** Another area of innovation in wireless networks and devices lies in machine-to-machine (“M2M”) communications such as telemetry, smart grid, and industrial monitors. While today the growth in connected devices is driven by connecting people, future growth will be dominated by connecting devices – heart monitors, refrigerators, power plants, and many more.

As of December 2010, each of the four major carriers already had millions of M2M devices activated on their networks, and all are moving aggressively to increase that number.<sup>350</sup> One industry study predicts that by 2020, over 50 billion network-enabled machines will be connected to the Internet – many of them wirelessly.<sup>351</sup> Carriers are investing heavily and competing to capture a portion of this market.<sup>352</sup>

To do so, Verizon Wireless and other network operators have opened their networks to machine-to-machine devices with embedded wireless functionality and offer business, technical, and institutional assistance to companies developing M2M solutions.<sup>353</sup> For example, Verizon Wireless operates LTE Innovation Centers to assist participants to design and develop LTE-enabled products. Verizon Wireless has also introduced a virtual LTE Innovation Center where device developers can access an online portal to obtain support services and directly

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<sup>350</sup> JOHN KEOUGH, YANKEE GROUP, A CLOSER LOOK AT M2M CARRIER STRATEGY 2 (Dec. 2010), <http://www.yankeegroup.com/ResearchDocument.do?id=54918> (“YANKEE GROUP M2M REPORT”); *see also* SAM LUCERO, ABI RESEARCH, MAXIMIZING MOBILE OPERATOR OPPORTUNITIES IN M2M 7 (2010), [http://www.cisco.com/en/US/solutions/collateral/ns341/ns523/ABI-CISCO\\_M2M\\_Operator\\_Opportunity.pdf](http://www.cisco.com/en/US/solutions/collateral/ns341/ns523/ABI-CISCO_M2M_Operator_Opportunity.pdf) (“MNOs, such as Sprint, AT&T, Verizon Wireless, Orange, Rogers Communications, Telenor, Telefonica, and NTT DOCOMO, are actively deploying M2M-based services.”).

<sup>351</sup> ARPIT JOSHIPURA, ERICSSON, MOBILE INFRASTRUCTURE INNOVATION – CAN THE CHALLENGE BE MET? 4 (Sep. 2010), <http://electronics.wesrch.com/paper-details/pdf-EL1WSSK5HLDRE-mobile-infrastructure-innovation-can-the-challenge-be-met>.

<sup>352</sup> YANKEE GROUP M2M REPORT at 2.

<sup>353</sup> *See* Maisie Ramsay, *AT&T, Verizon Bet on Embedded Devices*, WIRELESS WEEK, June 14, 2010, <http://www.wirelessweek.com/Articles/2010/06/Carriers-Embedded-Devices-ATT-Verizon>.

communicate with Center engineers.<sup>354</sup> The Center helps developers assess what types of new products and services may best succeed in the marketplace. And, in partnership with the 4G Venture Forum, the Innovation Centers offer seed capital for selected projects.<sup>355</sup>

Other wireless carriers have made similar efforts to pursue business from companies desiring M2M solutions. For example, AT&T offers an M2M portal which assists businesses in establishing M2M systems. AT&T has certified over 1,000 device models as network-ready.<sup>356</sup> Sprint Nextel's Integrated Solutions Group (ISG) has 50 employees fully dedicated to the M2M space and focuses on tracking applications as well as digital signage, smart grid, ATM point-of-sale applications, asset tracking, industrial automation and control, telematics, security, and emergency response applications.<sup>357</sup> T-Mobile has an entire business group dedicated to serving the M2M space and focuses on telematics, asset-tracking, fleet management, connected energy, telemedicine, security, and rent-to-own.<sup>358</sup>

## **B. Applications, Content, and Mobile Commerce Spur Usage that Fuels the Competitive Mobile Marketplace**

The wireless application market is characterized by intense competition and greater choices for consumers than ever before. The attractiveness and usefulness of apps in general has helped to boost usage of mobile devices – which in turn fuels the wireless ecosystem. Moreover, the array of players in the application, content, and mobile commerce segments of the marketplace reflects widespread and significant innovation in today's mobile arena.

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<sup>354</sup> Press Release, Verizon Wireless, Developers: The Verizon Wireless LTE Innovation Center Lab Opens (Oct. 5, 2009), <http://news.vzw.com/news/2009/10/pr2009-10-05.html>.

<sup>355</sup> See generally Verizon Wireless, Innovation Centers, <https://www.lte.vzw.com/> (last visited Nov. 22, 2011).

<sup>356</sup> YANKEE GROUP M2M REPORT at 4-6.

<sup>357</sup> *Id.*

<sup>358</sup> *Id.*

## 1. Applications Are Exploding in Number and Appeal

Today there are staggering numbers of applications available to wireless consumers, and the number of applications, developers, and distribution channels increases every day. As the Commission has recognized, the ability to access a wider variety of applications and content and to browse the web more openly has become increasingly popular with consumers.<sup>359</sup> By late 2011, researchers report that the Android Market has had 6.75 billion app downloads producing \$341 million in gross revenue, while the Apple App Store has had 18.5 billion downloads producing \$4.9 billion in gross revenue.<sup>360</sup> Market researcher In-Stat projects that there will be 48 billion app downloads by 2015, giving rise to more than \$29 billion in revenue.<sup>361</sup>

Indeed, consumers can and do use their smartphones and tablets to access applications for content and transactions that once would only have been available from a computer moored to a desk. Consumers control their own unfettered access to content and the Internet and a seemingly unlimited variety of applications that provide untold uses and open the door to a broad assortment of information and content. Many consumers have substituted their wireless devices for other electronic equipment and computing devices, downloading apps to play games, watch movies and television shows, pay parking meters, purchase movie tickets, interact on social networking sites, take photos, and make video recordings – a process that has been described as

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<sup>359</sup> *Fifteenth Report*, 26 FCC Rcd at 9756-57 ¶ 151 (footnotes omitted).

<sup>360</sup> Josh Lowensohn, *Despite Growth, Google Trails Apple in App Dollars Spent*, CNET.COM, Nov. 21, 2011, [http://news.cnet.com/8301-27076\\_3-57328804-248/despite-growth-google-trails-apple-in-app-dollars-spent/](http://news.cnet.com/8301-27076_3-57328804-248/despite-growth-google-trails-apple-in-app-dollars-spent/).

<sup>361</sup> Matt Hamblen, *App Store, Android Market Spur Explosive App Download Growth*. COMPUTERWORLD, July 26, 2011, [http://www.computerworld.com/s/article/9218654/App\\_Store\\_Android\\_Market\\_spur\\_explosive\\_app\\_download\\_growth](http://www.computerworld.com/s/article/9218654/App_Store_Android_Market_spur_explosive_app_download_growth).

the “smartphoneization of stuff.”<sup>362</sup> As a result, the market for applications is characterized by intense competition and greater choice for consumers than ever before.

*Size and Scope of App Store Offerings.* There are at least ten applications stores in today’s marketplace. Some are administered by providers of wireless operating systems, such as the Apple App Store, the Google Android Marketplace, and the Windows Marketplace for Mobile. Some are unaffiliated with an OS vendor, like Getjar and Appia/PocketGear’s Handango, which are the largest multi-OS app stores. Some are independent single-OS vendors, like Amazon’s App Store for Android. And some are administered by network providers, like Verizon Wireless’ V CAST App Store.

A comparison of the various major application stores’ inventory over the last year shows the huge growth in applications:<sup>363</sup>

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<sup>362</sup> Rebecca Greenfield, *The Smartphonification of Stuff*, THE ATLANTIC WIRE, Nov. 17, 2011, <http://www.theatlanticwire.com/technology/2011/11/smartphonification-stuff/45104/>; see Nick Bilton, *Say, Can You Make Phone Calls on That Camera?*, N.Y. TIMES, Nov. 17, 2011, at B1.

<sup>363</sup> In the following table, the figures for mid-2010 are taken from Verizon Wireless’s 2010 Competition Comments at 112 unless otherwise noted.

Application Store	Number of Applications Available	
	Mid-2010	Mid to Late-2011
iTunes App Store	>231,000 (iPhone) >11,000 (iPad)	>500,000 <sup>364</sup> (iPhone) >101,000 <sup>365</sup> (iPad)
Android Market	>70,000	>500,000 <sup>366</sup>
Handango/Appia <sup>367</sup>	>140,000	>140,000 <sup>368</sup>
GetJar	>75,000	>150,000 <sup>369</sup>
Nokia Ovi Store	>6,800	~50,000 <sup>370</sup>
BlackBerry App World	~7,000	~35,000 <sup>371</sup>
Windows Phone Marketplace	N/A <sup>372</sup>	~40,000 <sup>373</sup>
Mobango	35,000 <sup>374</sup>	>95,000 <sup>375</sup>

<sup>364</sup> See Joe Arico, *Android Market Posts Big Numbers, Surpasses Apple*, MOBILELEDIA.COM, Oct. 26, 2011, <http://www.mobiledia.com/news/113945.html>.

<sup>365</sup> See *Over 100,000 iPad Apps Available*, IPADHELP.COM, July 2, 2011, <http://ipadhelp.com/ipad-news/over-100000-ipad-apps-available/>.

<sup>366</sup> See Zach Epstein, *Android Market Surpasses 500,000 Published Apps*, BGR.COM, Oct. 21, 2011, <http://www.bgr.com/2011/10/21/android-market-surpasses-500000-published-apps/>.

<sup>367</sup> PocketGear bought Handango in 2010 and rebranded Handango as Appia in February 2011. See Kevin C. Tofel, *App Store Smarts, Not Apps, May Be the Better Investment*, GIGAOM.COM, Mar. 30, 2011, <http://gigaom.com/mobile/appia-funding/>.

<sup>368</sup> See Appia, *About Appia*, <http://www.appia.com/about/> (last visited Dec. 1, 2011) (figures are for multiple OSs).

<sup>369</sup> See GetJar, *Frequently Asked Questions*, <http://www.getjar.com/about/frequently-asked-questions/> (last visited Dec. 1, 2011).

<sup>370</sup> See Rafe Blandford, *Windows Phone Marketplace Passes 35,000 Apps*, ALLABOUTWINDOWSPHONE.COM, Oct. 23, 2011, [http://allaboutwindowophone.com/news/item/13442\\_Windows\\_Phone\\_Marketplace\\_pass.php](http://allaboutwindowophone.com/news/item/13442_Windows_Phone_Marketplace_pass.php).

<sup>371</sup> Press Release, *Research In Motion, BlackBerry App World Now Available In Vietnam* (Aug. 29, 2011), <http://press.rim.com/release.jsp?id=5165>.

<sup>372</sup> Phones based on the Windows Phone 7 operating system, Microsoft's successor to Windows Mobile, were first launched in October 2010. See Press Release, *Microsoft, Microsoft and Partners Unveil Windows Phone 7 Global Portfolio* (Oct. 11, 2010), <http://www.microsoft.com/Presspass/press/2010/oct10/10-11MSWP7PR.mspx>.

<sup>373</sup> See David Murphy, *At 40K Apps, How Does the Window Phone Marketplace Stack Up?*, PCMAG.COM, Nov. 20, 2011, <http://www.pcmag.com/article2/0,2817,2396672,00.asp>.

<sup>374</sup> See Tricia Duryee, *Mauj Mobile Acquires UK's Mobango Catalog of Apps*, CONTENTSUTRA.COM, Aug. 17, 2010, <http://contentsutra.com/article/419-mauj-mobile-acquires-uks-mobango-catalog-of-apps/>.

<sup>375</sup> See Mobango, *Mobango Mobile Power, Mobile Applications*, <http://www.mobango.com/swarea/index.php/home?area=apps> (listing 21,932 applications) (last visited Dec. 1, 2011); Mobango, *Mobango Mobile Power, Mobile Games*, (continued on next page)

*Evolution Toward Greater Range of App Origins.* In the early days of wireless information services, limitations on bandwidth and on the technological capabilities of handsets led to the use of an “on-deck” model, whereby wireless service providers offered their customers a curated assortment of information services – applications and content – hosted by the provider. The on-deck content and applications could be custom-processed by the network to provide optimal performance for the user’s handset type. As handsets and operating systems have become more sophisticated, consumers are better able to access “off-deck” content from the Internet using a browser and to install apps on their devices directly.

With the strong growth in both the number of apps available and the number of downloads, it is not surprising that wireless device owners are increasingly likely to have apps installed on their devices. The Pew Internet Project found that adult mobile phone owners, for example, are twice as likely to have apps installed on their phones now than two years ago, with 50 percent having apps installed.<sup>376</sup>

## **2. Paid and Unpaid Content Is Shuttling Across Platforms to Follow Consumer Demand**

Wireless subscribers can use apps on their handsets to access the content they choose, and their options increasingly include subscription-based services that originated on other platforms. Both The New York Times and The Wall Street Journal have apps for smartphones

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<http://www.mobango.com/swarea/index.php/home?area=games> (listing 74,194 applications) (last visited Dec. 1, 2011).

<sup>376</sup> KRISTEN PURCELL, PEW INTERNET & AMERICAN LIFE PROJECT, HALF OF ADULT CELL PHONE OWNERS HAVE APPS ON THEIR PHONES 5-6 (Nov. 2, 2011), [http://pewinternet.org/~media/Files/Reports/2011/PIP\\_Apps-Update-2011.pdf](http://pewinternet.org/~media/Files/Reports/2011/PIP_Apps-Update-2011.pdf).

and for tablets.<sup>377</sup> There are also apps providing access to CNN, Fox News, NPR, Al Jazeera, the BBC, and other services.<sup>378</sup> Magazines are also readily available through apps developed by their publishers, which are reported to have stimulated demand substantially.<sup>379</sup> There are apps for streaming movies and television shows from Netflix, HBO, Showtime, and other channels.<sup>380</sup> Sports fans can get scores and videos from the NFL, Major League Baseball, the Golf Channel, and ESPN.<sup>381</sup> Video program distributors offer many different services to their customers via specialized apps – for example, Verizon FiOS television subscribers can use apps to watch on-demand programming, control their digital video recorders, and manage their accounts. Moreover, apps can be used to book tickets for events at theaters and other venues, through Fandango or Moviefone.<sup>382</sup> The Redbox app can locate and reserve video rentals.<sup>383</sup>

Many applications now include location-based features that can employ the GPS capability included in most wireless devices or even a rough location capability based on detection of cell towers or WiFi signals.<sup>384</sup> Location-based apps are not limited to the obvious ones such as mapping, direction-finding, and social networking. Location-enabled search can

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<sup>377</sup> See Android Market, <http://market.android.com> (last visited Dec. 5, 2011); see The Wall Street Journal, Mobile Products, <http://online.wsj.com/public/page/designtech-wsjModuleAndPhone.html> (last visited Dec. 1, 2011).

<sup>378</sup> See Android Market, <http://market.android.com> (last visited Dec. 5, 2011).

<sup>379</sup> Robert Andrews, *Newsstand's Few Early Adopters Have Stolen A March On Laggards*, MOCONEW.NET, Nov. 18, 2011, <http://moconews.net/article/419-newsstands-few-early-adopters-have-stolen-a-march-on-laggards/>. The article indicates that Conde Nast publications encountered a 268% increase in weekly subscriptions and a 142% increase in single-copy sales for the nine publications involved; The New York Times encountered an increase in new weekly iPad downloads from 27,000 to 189,000 and iPhone downloads were up 85%, both after just the first week of the new platform.

<sup>380</sup> See Android Market, <http://market.android.com> (last visited Dec. 1, 2011).

<sup>381</sup> See *id.*

<sup>382</sup> See *id.*

<sup>383</sup> See *id.*

<sup>384</sup> See *id.*

also prioritize search results by location, find nearby restaurants, or alert users to traffic delays.<sup>385</sup>

Verizon Wireless even offers a location-enabled battery-saver, which turns WiFi on only in locations designated by the user, such as the home, the office, and the local coffee shop.

### 3. Apps for Mobile Commerce Are Growing the Economy

Mobile commerce is expected to “grow into a \$119 billion global industry” by 2015.<sup>386</sup>

In the United States alone, Forrester Research estimates that mobile commerce retail sales are growing at a compound annual rate of 39 percent, and will reach \$31 billion by 2016.<sup>387</sup>

Moreover, a record proportion of shopping now takes place on mobile devices. An IBM survey covering more than 500 leading retailers reports that in October 2011, “11 percent of people used a mobile device to visit a retailer’s site, up from 4.2 percent in October 2010,” and that 9.6 percent of sales go to mobile users, up from 3.4 percent a year ago.<sup>388</sup> Amazon claims that the proportion of its customers who shop only using mobile devices has tripled over a year ago.<sup>389</sup>

Even in-store shopping is becoming more dependent on mobile devices. Apple has added a feature to its Apple Store app that allows a user shopping in the Apple Store to scan a product’s bar code with the iPhone to research and even buy the item.<sup>390</sup> And handsets are coming closer to being substitutes for credit cards as devices become equipped with near-field communications

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<sup>385</sup> *See id.*

<sup>386</sup> *See* Douglas MacMillan and Joseph Galante, *As Mobile Shopping Takes Off, EBay Is an Early Winner*, BUSINESSWEEK.COM, June 23, 2010, [http://www.businessweek.com/magazine/content/10\\_27/b4185027420770.htm](http://www.businessweek.com/magazine/content/10_27/b4185027420770.htm).

<sup>387</sup> Christina Cheddar Berk, *Merry Mobile Christmas: M-Commerce Takes Off*, USATODAY.COM, Nov. 18, 2011, <http://www.usatoday.com/tech/news/story/2011-11-18/mobile-commerce-takes-off/51300884/1>.

<sup>388</sup> Press Release, IBM, *Mobile Device Retail Traffic to More than Double This November Holiday Season*, Reports IBM (Nov. 4, 2011), <http://www-03.ibm.com/press/us/en/pressrelease/35909.wss>.

<sup>389</sup> Stephanie Clifford, *Mobile Deals Set to Lure Shoppers Stuck in Line*, N.Y. TIMES, Nov. 20, 2011, at A1.

<sup>390</sup> Quentin Hardy, *Apple Takes iTunes to Other Kinds of Payments*, BITS BLOG, Nov. 10, 2011, <http://bits.blogs.nytimes.com/2011/11/10/apple-takes-itunes-to-other-kinds-of-payments/?scp=1&sq=near%20field%20communications&st=cse>.

(“NFC”) chips that allow the handset to be waved over a scanner to make purchases. NFC has emerged from its pilot phase, and phones are now being built with NFC chips built in – one chipmaker sold 10 million chips destined for handsets that hit the market last summer, and another predicts that as many as 40 million NFC phones will be shipped this year.<sup>391</sup>

Apart from NFC “mobile wallets,” bank and credit card companies are experiencing rapid adoption of mobile access to accounts. This is especially true with respect to banking apps. Data recently published by comScore indicate that mobile banking app usage increased by 45 percent from the end of 2010 to mid-2011, and mobile credit card app usage increased by 43 percent over the same period.<sup>392</sup>

This holiday season will be an increasingly mobile experience. The New York Times reports that Anthropologie has “commissioned a new iPad app, designed to give shoppers a flavor of its own store, but also to offer a new way to shop, by allowing people to browse, mix and match items, and view multimedia features in ways not possible in stores, print catalogs or online.”<sup>393</sup> The article reveals that, according to Forrester Research, “60 percent of tablet owners use them to shop.”<sup>394</sup>

Of course, there are many other examples of mobile commerce activities advanced by apps. For example, B&H Photo-Video and Newegg have apps that allow a customer to read

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<sup>391</sup> Tom Loftus, *Nearer and Nearer: NFC Chipmaker Celebrates Numbers*, DIGITS BLOG, Oct. 26, 2011 (“Nearer and Nearer”), <http://blogs.wsj.com/digits/2011/10/26/nearer-and-nearer-nfc-chipmaker-celebrates-numbers/>.

<sup>392</sup> Press Release, comScore, *Mobile Banking App Usage in the U.S. Increases 45 Percent from Q4 2010* (Oct. 26, 2011), [http://www.comscore.com/Press\\_Events/Press\\_Releases/2011/10/Mobile\\_Banking\\_App\\_Usage\\_in\\_the\\_U.S.\\_Increases\\_45\\_Percent\\_from\\_Q4\\_2010](http://www.comscore.com/Press_Events/Press_Releases/2011/10/Mobile_Banking_App_Usage_in_the_U.S._Increases_45_Percent_from_Q4_2010).

<sup>393</sup> Claire Cain Miller, *Retailers Enliven Catalog Offerings through Apps*, N.Y. TIMES, Nov. 21, 2011, at B3.

<sup>394</sup> *Id.*

reviews of photographic, video, electronic, or computer equipment, in addition to perusing specifications and placing orders. Another example is parking – several companies have developed apps that facilitate paying for public parking through a wireless device instead of feeding twenty or more coins into a meter. All public metered parking in D.C. is now subject to optional wireless payments.<sup>395</sup> Both buyers and sellers of goods on eBay can streamline their activities using apps – eBay offers *seventeen* official eBay apps.<sup>396</sup> Members of daily-deal sites such as Groupon and LivingSocial can use the sites’ custom apps to review and purchase coupons and even redeem coupons by displaying them on the handset instead of printing them out. Likewise, many airlines have apps that allow the user to view flight information, check in, and display a boarding pass instead of printing it out.

Some mobile commerce apps come with hardware that interfaces with the app to turn the handset into an entirely different device. For example, Square is an app with a small credit card reader that plugs into the headset jack of an Android or iOS device; once the user has set up an account, Square can ring up credit and debit card transactions and send receipts to customers by email or text message.

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<sup>395</sup> See, e.g., Margery Censer, *Companies Hit Throttle on High-Tech Parking*, WASHINGTONPOST.COM, Oct. 9, 2011 [http://www.washingtonpost.com/business/capitalbusiness/companies-pitch-high-tech-parking-to-cities/2011/10/03/gIQAgv7fYL\\_story.html](http://www.washingtonpost.com/business/capitalbusiness/companies-pitch-high-tech-parking-to-cities/2011/10/03/gIQAgv7fYL_story.html).

<sup>396</sup> For the iPhone, eBay offers its standard eBay app as well as the eBay Fashion, eBay Motors, Half.com, StubHub, eBay Instant Sale, eBay Classifieds, RedLaser, eBay Selling, and eBay Deals apps. For the iPad it provides the standard eBay app. For Android, it offers the standard eBay app as well as eBay Classifieds and RedLaser apps. For Windows Phone 7, it offers a standard eBay app, and the same for Blackberry. It also offers an eBay mobile web app that is usable on a wide variety of devices. See eBay, eBay Mobile, <http://mobile.ebay.com/> (last visited Dec. 1, 2011).

Taken together, the device, application, and content modules of wireless competition each continue to grow and innovate at breakneck speeds. This growth is feeding a virtuous cycle of investment and consumer value, with no signs of slowing down.

#### **IV. THE INPUT MARKET SEGMENTS ILLUSTRATE A COMPETITIVE LANDSCAPE**

Competition in the input modules of the mobile ecosystem, including spectrum, backhaul, and infrastructure, also fuels rivalry in the larger wireless services sector.<sup>397</sup> While the marketplace for each of these segments continues to thrive, policymakers must remain vigilant to continue to make additional spectrum available and remove regulatory barriers to investment.

##### **A. While More Spectrum Will Be Needed, Spectrum Is Not a Competitive Constraint**

Sufficient spectrum resources are, of course, an essential wireless input, necessary to continue the robust growth occurring throughout the mobile ecosystem. Wireless providers have efficiently used the available spectrum to meet the ever-growing demand for more mobile traffic. More spectrum to address this exponentially expanding demand is coming to market – and, as the National Broadband Plan recognized, even more spectrum will be needed.

For years, Verizon Wireless and other providers have invested billions of dollars in deploying more advanced radio technologies and optimizing network design for more efficient spectrum use. These technological developments include the migration from analog to digital technologies and deployment of next generation networks, increased frequency reuse, antenna sectorization, and cell splitting, all of which have enabled the wireless industry to drive substantial efficiencies in spectrum use. The results have been significant – greater capacity and

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<sup>397</sup> *Fifteenth Report*, 26 FCC Rcd at 9820 ¶ 264.

increasingly sophisticated data products and services. This growth has been achieved even though, as the *Fifteenth Report* noted, “mobile wireless operators primarily use licenses associated with three different frequency bands to provide mobile voice and, in most cases, mobile data services: Cellular (in the 850 MHz band), SMR (in the 800/900 MHz band), and broadband PCS (in the 1.9 GHz band).”<sup>398</sup>

Additional spectrum resources are fast coming into use. The AWS-1 and 700 MHz auctions, as well as the BRS/EBS modernization and other Commission initiatives (including MSS and WCS reform), brought much more spectrum into the mobile wireless market, enabling the wireless ecosystem to continue to flourish. These spectrum resources are critical to meeting consumer demand and creating new opportunities for providers.

Further, as discussed above, secondary markets are an effective means of providing access to spectrum.<sup>399</sup> Carriers of all sizes purchase and lease spectrum in the secondary market on a regular basis. Indeed, the FCC approves hundreds of transfer/assignment applications and spectrum leasing applications each year, and those transactions have been increasing.<sup>400</sup> In addition, marketplace actors such as Spectrum Bridge, Inc. have emerged to serve as clearinghouses for secondary market transactions.<sup>401</sup> All carriers, including new entrants and smaller providers, have access to spectrum through the secondary market.

Despite these opportunities, it is clear that still more spectrum will be needed. The National Broadband Plan found that “[t]he growth of wireless broadband will be constrained if

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<sup>398</sup> *Id.* at 9822 ¶ 269.

<sup>399</sup> *See supra* Section II.B.1.b at 57-62 (discussing the importance of secondary markets, including leasing, to making spectrum available and the increasing amount of spectrum leasing).

<sup>400</sup> *Id.*

<sup>401</sup> *Id.*

government does not make spectrum available to enable network expansion and technology upgrades.”<sup>402</sup> Verizon Wireless thus fully supports the National Broadband Plan’s call for 500 additional MHz of spectrum for mobile broadband in the next ten years.

**B. Competition in Backhaul Provides Ample Choices for Mobile Providers to Meet Their Needs**

The marketplace for backhaul used to support mobile communications is marked by growth, healthy competition, diverse suppliers and service offerings, and continuous innovation. As demonstrated above, wireless traffic volumes have increased and will continue to increase exponentially, further boosting demand for backhaul services and making it necessary to upgrade to higher-capacity facilities in all areas. According to the Yankee Group, “[a]verage macrocell backhaul requirements were 10 Mbps in 2008.... In less than three years, they have more than tripled to 35 Mbps in 2011, and by 2015 ... they will demand 100 Mbps.”<sup>403</sup>

The DS-1 capacity copper facilities that have long been used to service cell sites are giving way to higher-capacity facilities capable of accommodating 3G and 4G wireless traffic:

Vendors have spent the past several years ramping up the capacity of their backhaul solutions in the run-up to 3G and 4G introductions. Operators have spent the past few years upgrading

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<sup>402</sup> NATIONAL BROADBAND PLAN at 77; *see also* Presidential Memorandum, The White House, Presidential Memorandum: Unleashing the Wireless Broadband Revolution (June 28, 2010), <http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution> (“America’s future competitiveness and global technology leadership depend, in part, upon the availability of additional spectrum.”).

<sup>403</sup> Jennifer Pigg, Yankee Group, *Wholesale Mobile Backhaul: There’s Gold in Them There Hauls*, 4G TRENDS, June 29, 2011, <http://www.4gtrends.com/articles/40130/wholesale-mobile-backhaul-theres-gold-in-them-ther/>. *See also* Press Release, Visant Strategies, Backhaul Capacity of United States Mobile Wireless Networks Will Continue to Increase Substantially, new Visant Strategies Report Finds, [http://www.visantstrategies.com/forecast/US\\_wireless\\_backhaul\\_4G.html](http://www.visantstrategies.com/forecast/US_wireless_backhaul_4G.html) (last visited Dec. 1, 2011) (“[B]ase stations with more than 24 Mbps of backhaul capacity will grow by more than a factor of twenty from 2009 to 2015 while in 2015 the number of base stations with less than 12 Mbps of backhaul capacity will be half of that today.”); Andy Fuertes & Larry Swasey, *Mobile Backhaul - The Backhaul Heat Is On*, CED, Sep. 30, 2011, <http://www.cedmagazine.com/articles/2011/09/mobile-backhaul-the-backhaul-heat-is-on> (“Mobile carriers in the United States are seeking an average of 100 Mbps to 300 Mbps per tower on 3.5G and 4G cell sites for backhaul.”).

their backhaul networks with new capacities and IP functionality. The upgrade cycle, however, is far from over.... Beyond [a need for greater scalability in the transport layer] is the understanding that no single technology represents a backhaul “silver bullet” and that continuing evolutions in the backhaul layer open up opportunities for new product, solution and business model introductions.<sup>404</sup>

The following chart highlights current and projected backhaul trends relative to fiber, microwave, and other technologies<sup>405</sup>:

Backhaul Links for Wireless Network Elements In Use by Technology							
Year	Microwave Links	Copper (T1, DSL) Links	Fiber Links	Coaxial Cable Links	Free Space Optics Links	Other Technologies Links	Total Links
2008	91,057	186,485	26,714	5,684	302	10	310,252
2009	114,675	178,530	31,731	6,105	323	28	331,392
2010	133,264	174,701	38,083	7,137	340	46	353,571
2011	153,899	179,274	45,693	8,457	361	64	387,748
2012	166,146	185,834	53,529	12,378	901	82	418,870
2013	190,145	173,651	60,562	19,539	2,749	100	446,746
2014	211,331	159,999	68,115	27,720	4,780	118	472,063
2015	226,285	145,859	75,053	38,021	8,718	136	494,072
CAAG	14%	-3%	16%	31%	62%	45%	7%

Note: Backhaul links include direct connections to base stations, as well as connections to and from BSC/RNC, MSC and collector points that aggregate traffic to BSC/RNCs.

**Figure 1: Backhaul links for wireless network elements in use by technology. Statistics are for the U.S. market from 2008-2015. Source: Visant Strategies.**

<sup>404</sup> Peter Jarich, *Has 4G Moved Beyond 4G World?*, FIERCE BROADBAND WIRELESS, Nov. 2, 2011, <http://www.fiercebroadbandwireless.com/story/jarich-has-4g-moved-beyond-4g-world/2011-11-02>. See also, e.g., Press Release, Juniper Research, *Mobile Network Upgrades of up to \$840bn Required Over Next Five Years to Meet Burgeoning Data Demand, Finds Juniper Research* (Sep. 14, 2011), <http://www.juniperresearch.com/viewpressrelease.php?pr=259> (“[E]xisting backhaul networks, based on legacy technologies, are not capable of supporting the forecasted increase in both data users and data traffic. Choosing the right technology, or the right combination of technologies, will be a key part of minimising [sic] capital costs.”).

<sup>405</sup> Andy Fuertes & Larry Swasey, *Mobile Backhaul - The Backhaul Heat Is On*, CED, Sep. 30, 2011, <http://www.cedmagazine.com/articles/2011/09/mobile-backhaul-the-backhaul-heat-is-on>.

Infonetics projects that the global market for mobile backhaul will reach \$10.4 billion in 2014 (compared to \$7.2 billion in 2009).<sup>406</sup> Maravedis projects that the microwave segment of the market will exceed \$12 billion alone by 2016, mainly due to “the need for operators to deploy new base stations to provide good quality of experience over LTE networks.”<sup>407</sup>

The growth in demand for capacity, coupled with constant technological innovation, has made the backhaul market extremely competitive. That is not surprising – the Commission has long recognized that enhanced capacity needs render deployment of competitive facilities more and more feasible, because higher-capacity facilities open opportunities for higher revenues that outpace increased deployment costs.<sup>408</sup> As a result, many competitive providers, including several new entrants, are focused on providing mobile backhaul service.

Mobile broadband providers thus can – and do – obtain backhaul, including fiber or microwave, from a variety of providers, including not only incumbent local exchange carriers but also competitive fiber providers, cable companies, utilities, and fixed wireless providers. Sprint, for example, recently announced that it would be awarding contracts for fiber-based backhaul at 30,000 sites over the next year and that it “will end up with ‘25 to 30 significant backhaul providers’ that will likely be a mix of incumbent LECs, cable MSOs, and alternative carriers.”<sup>409</sup> And competitive wholesalers, cable operators, and wireless backhaul specialists

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<sup>406</sup> Press Release, Infonetics Research, Shift seen in operator strategy for mobile backhaul; equipment spending up 21% (Apr. 21, 2010), <http://www.infonetics.com/pr/2010/Mobile-Backhaul-and-Microwave-Market-Highlights.asp>.

<sup>407</sup> Ian Mansfield, *Microwave Backhaul Equipment Market to Surpass US\$ 12 Billion by 2016*, CELLULAR-NEWS, May 25, 2011, <http://www.cellular-news.com/story/49312.php> (citing a Maravedis report).

<sup>408</sup> See, e.g., Unbundled Access to Network Elements; Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Order on Remand*, 20 FCC Rcd 2533, 2578 ¶ 71 (2005) (“[R]evenues generated increase with the amount of traffic that is carried on a particular transport route.”).

<sup>409</sup> Carol Wilson, *Sprint to Reveal Backhaul Contract Winners Friday*, LIGHT READING, Oct. 5, 2011, [http://www.lightreading.com/document.asp?doc\\_id=213050](http://www.lightreading.com/document.asp?doc_id=213050).

have all successfully entered the market.<sup>410</sup> Competitive wholesalers “are being particularly aggressive in targeting new wireless backhaul opportunities,” while cable operators “such as Charter Communications, Comcast Business, Cox Carrier Services and Time Warner Cable Business Class have become a credible threat in the wireless backhaul race.”<sup>411</sup>

Of note, where higher-capacity facilities must be constructed in greenfields – for example, when they are built to service new wireless towers or to expand capacity at existing towers – no backhaul provider has any inherent advantage. Hence, although Verizon Wireless is constructing new connections to meet the growing demand for high-capacity backhaul services, it also can go to a wide variety of alternative backhaul providers. For instance, competitive fiber providers continue to build and deploy high-capacity mobile broadband backhaul facilities throughout the country, including in rural areas.<sup>412</sup> As recently noted by Juniper Research: “Fibre backhaul can support almost unlimited bandwidth and can be either leased or deployed by the operators themselves. According to our research, we are forecasting that fibre will overtake

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<sup>410</sup> FIERCETELECOM.COM, TELCO BACKHAUL STRATEGIES 1 (Nov. 2011), [http://www.fiercetelecom.com/offer/telco\\_backhaul](http://www.fiercetelecom.com/offer/telco_backhaul).

<sup>411</sup> *Id.*

<sup>412</sup> See, e.g., COLBY SYNESAE & JONATHAN CHARBONNEAU, COWAN AND COMPANY, FIBER: A SECTOR EVOLVES 20 (Oct. 29, 2010) (“While there are many incumbent providers such as AT&T, Sprint, Qwest and Verizon Wholesale, as well as cable providers like Cablevision and Cox, going after the wireless backhaul market, a variety of fiber providers are also targeting the market including FiberTech, Intellifiber, Level 3, Lighttower and Zayo.”); Press Release, Ciena Corporation, Fibertech Networks Selects Ciena to Deliver Mobile Backhaul Network (Oct. 24, 2011), <http://www.businesswire.com/news/home/20111024005134/en/Fibertech-Networks-Selects-Ciena-Deliver-Mobile-Backhaul> (“Ciena ... has partnered with Fibertech Networks, a provider of metro-based fiber optic network services to customers in the eastern and central United States, to build a reliable and robust mobile backhaul network for a wireless service provider in Connecticut. The deployment will connect 250 cell towers across the state and support the carrier’s efforts to meet business and residential customer demand for high-bandwidth applications such as video streaming, music downloading, mobile TV, and more, to mobile devices.”); Press Release, Northeast Services Cooperative, “Landmark agreement” between Frontier and NES (Nov. 2, 2011), <http://www.ardc.org/documents/NewsItems/Frontier%20news%20release%20-%20signed%20agreement.pdf> (announcing that Frontier Communications has signed an agreement with the Northeast Service Cooperative (NES) to use 450 miles of NES’s extensive fiber network in northeast Minnesota for backhaul and other services).

copper as the most adopted access technology compared to traditional adoption rate of copper and will be increasingly deployed by the operators in North America to cater to the high bandwidth and quality wireless services.”<sup>413</sup>

In recent years, the cable industry has been particularly aggressive in providing backhaul services. Given their ubiquitous networks, cable companies can readily serve cell sites:

With their vast residential household coverage and increasingly extensive fiber builds, cable operators already pass most existing cell towers with either hybrid fiber/coax (HFC) or direct fiber lines, giving them valuable assets to support mobile backhaul. Indeed, several regional market studies have indicated that upwards of 80 percent to 90 percent of all existing U.S. cell towers are located within cable’s current footprint, while many others lie just beyond its wired reach.<sup>414</sup>

“U.S. cable operators will have 35,000 cell towers wired by the end of 2013 and 45,000 linked by the close of 2015. At that pace, the industry will capture as much as 15 percent of the U.S. market by then, based on the projected number of cell towers.”<sup>415</sup> Indeed, Cox Communications has been providing cellular backhaul for more than a decade, and other large cable operators, including Comcast, Time Warner Cable, Cablevision Systems, and Bright House Networks, also are aggressively pursuing the opportunity. As one representative of Cox noted, “from a cable perspective, we’re very well-positioned, given the amount of fiber density we have

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<sup>413</sup> Nitin Bhas, Sprint to Deploy LTE-A, to Use Fibre Backhaul, <http://www.juniperresearch.com/analyst-xpress-blog/2011/10/26/sprint-to-deploy-lte-a-to-use-fibre-backhaul> (last visited Dec. 1, 2011).

<sup>414</sup> ALAN BREZNIK, HEAVY READING, STORMING THE CELL TOWER: MSOs MOVE WIRELESS BACKHAUL TO THE FOREFRONT 3 (July 2011), <http://www.ciena.com/corporate/blog/Cable-MSOs-Storming-the-cell-tower.html> (download requires free registration).

<sup>415</sup> *Id.* at 5.

in the metro areas that we serve, to leverage those assets to put in additional transport networks using SONET or Ethernet technology to provide high-speed backhaul out to the towers.”<sup>416</sup>

Utilities too are leveraging their existing fiber infrastructure to provide mobile backhaul, among other revenue-generating services. To cite just a few examples, Duke Energy and Florida Power & Light (via DukeNet and FPL Fibernet, respectively) offer mobile backhaul service via their extensive regional fiber networks.<sup>417</sup> SRP Telecom operates one of the largest private fiber-optic communications networks in Arizona, spanning 2900 square miles in 15 cities in its electrical service territory, including the Phoenix metropolitan area.<sup>418</sup>

Fixed wireless providers also are gaining market share in the mobile backhaul market, particularly in areas where they offer significant cost advantages over fiber.<sup>419</sup> One analyst has observed that “[t]here’s probably much more microwave going on in backhaul than people realize .... In many cases, customers ask for fiber but end up accepting microwave in many places once they examine the numbers and logistics involved.”<sup>420</sup> For example, Sprint Nextel recently told investors that, while it previously was “basically a T1 organization,” “[n]ow we’ve

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<sup>416</sup> Mike Robuck, *Mobile Backhaul: Opportunity Knocks for Cable Operators*, CED, Feb. 28, 2011, <http://www.cedmagazine.com/articles/2011/02/mobile-backhaul%3A-opportunity-knocks-for-cable-operators>.

<sup>417</sup> Craig Matsumoto, *7 Things to Know About Carrier Ethernet*, LIGHT READING, Nov. 11, 2011, [http://www.lightreading.com/document.asp?doc\\_id=214507](http://www.lightreading.com/document.asp?doc_id=214507); Rob Powell, *Fiber M&A: FPL FiberNet Buys Grande’s Fiber*, Mar. 3, 2011, TELECOM RAMBLINGS, <http://www.telecomramblings.com/2011/03/fiber-ma-fpl-fibernet-buys-grandes-fiber/>.

<sup>418</sup> See, e.g., SRP Telecom, About Wireline Services, <http://www.srp telecom.com/wirelineabout.aspx> (last visited Dec. 1, 2011).

<sup>419</sup> Greg Friesen, *Eenie, Meenie, Miney, Mo’ – Mo’ Backhaul, That Is!*, <http://www.ospmag.com/issue/article/Eenie-Meenie-Miney-Moe> (last visited Dec. 1, 2011) (“In terms of economics, one of the major benefits of microwave backhaul is that the cost is largely distance independent up to the maximum distance of a link (5 miles to 50 miles, depending on capacity required). This distance independence is because the cost is largely in the end point lease tower space, the equipment, and the spectrum required. These costs only scale marginally as distance increases.”).

<sup>420</sup> Ed Gubbins, *Microwave backhaul underestimated in fiber’s shadow*, NEW PARADIGM RESOURCES GROUP, Oct. 12, 2011, <http://blog.nprg.com/?p=2067>.

got the opportunity to use fiber or microwave and we choose site by site, and it's an economic decision and at times has to be a technology decision."<sup>421</sup> Prominent fixed wireless backhaul providers include XO Communications, the largest holder of LMDS spectrum in the United States.<sup>422</sup> XO's Carrier Wireless Access Service "is uniquely suited to address this market need [for high-bandwidth backhaul] due to the extensive reach, flexible channel size, smaller allowable antennas, and speed to market capabilities."<sup>423</sup> Clearwire has one of the largest microwave-based backhaul networks in the United States, a unique asset that could be used to sell bandwidth to other carriers: "Clearwire has built out a national wireless backhaul network that was purpose-built to handle far more 4G traffic than they have had success selling, and was built to scale well beyond that. And it's ready to go now .... There is no other asset like it out there, and it's not something that gets built every day."<sup>424</sup>

There also is notable growth among fixed wireless providers that supply mobile backhaul via millimeter wave spectrum, particularly the unlicensed 60 GHz and "lite-licensed" 70/80 GHz bands.<sup>425</sup> This growth is fueled by the fact that the millimeter wave bands are well suited to

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<sup>421</sup> Thomson StreetEvents, S - Sprint 4G Strategy/Network Update, Final Transcript at 8 (Oct. 7, 2011, 1:30PM GMT), [http://www.alacrastore.com/research/thomson-streetevents-Sprint\\_4G\\_Strategy\\_Network\\_Update-T4207432](http://www.alacrastore.com/research/thomson-streetevents-Sprint_4G_Strategy_Network_Update-T4207432).

<sup>422</sup> Press Release, XO Communications, XO Communications Announces New Teaming Agreement with Exalt Communications (Mar. 23, 2011), <http://www.xo.com/about/news/Pages/508.aspx>.

<sup>423</sup> *Id.*

<sup>424</sup> Rob Powell, *Finding Value in Clearwire*, TELECOM RAMBLINGS, Oct. 10, 2011, <http://www.telecomramblings.com/2011/10/finding-value-in-clearwire/>.

<sup>425</sup> See, e.g., *Michigan Tech campus selects BridgeWave Gigabit wireless system as fiber alternative*, CABLING INSTALLATION & MAINTENANCE, Oct. 21, 2011, [http://www.cablinginstall.com/index/display/article-display.articles.cabling-installation-maintenance.news.wireless.2011.10.michigan-tech\\_campus.html](http://www.cablinginstall.com/index/display/article-display.articles.cabling-installation-maintenance.news.wireless.2011.10.michigan-tech_campus.html); Press Release, LightPointe Communications, Inc., LightPointe Secures GSA Schedule Contract to Provide Gigabit Capacity Point-to-Point Wireless Bridges to the U.S. Government (Oct. 24, 2011), <http://www.marketwatch.com/story/lightpointe-secures-gsa-schedule-contract-to-provide-gigabit-capacity-point-to-point-wireless-bridges-to-the-us-government-2011-10-24>.

backhaul high amounts of traffic between picocell sites in 4G networks.<sup>426</sup> Infonetics expects that by 2015 “70% of millimeter wave equipment will be deployed in backhaul networks [in response to] the demand for high capacity mobile backhaul solutions for metro areas with high cell densities and small cells in particular.”<sup>427</sup>

The overall prospects for fixed wireless technology as a mobile backhaul alternative will be enhanced even further as the Commission implements its various initiatives for improving the flexibility and capacity of the Part 101 spectrum service rules. These initiatives include, among other things, facilitating fixed wireless use of the 7 and 13 GHz bands.<sup>428</sup>

Notwithstanding these regulatory efforts, mobile backhaul options in many high-cost rural areas are less robust than in urban and suburban areas. Importantly, however, in such locations it is less likely that either competitors *or* incumbents have already deployed facilities capable of providing higher-capacity services, meaning that no provider has any inherent advantage over another. In addition, as the Commission recently noted in its updated Rural

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<sup>426</sup> See, e.g., Michele Donegan, *Qualcomm Invests in Small-Cell Backhaul Startup*, LIGHT READING MOBILE, Oct. 18, 2011, [http://www.lightreading.com/document.asp?doc\\_id=213553](http://www.lightreading.com/document.asp?doc_id=213553) (“Siklu, which makes a microwave backhaul system that operates in the 71GHz-76GHz licensed E-band spectrum, said it will use the new funds to develop picocell backhaul products for Long Term Evolution (LTE) ....”).

<sup>427</sup> Press Release, Infonetics Research, Microwave and millimeter wave equipment evolving to support next-gen RAN (Mar. 29, 2011), <http://www.infonetics.com/pr/2011/Millimeter-Wave-and-Microwave-Equipment-Market-Highlights.asp>. See also Jonathan Wells, *High Capacity MM-Wave Coms: A Mid-Year Checkup*, MICROWAVE JOURNAL, June 24, 2011, <http://microwavejournal.blogspot.com/2011/06/high-capacity-mm-wave-coms-mid-year.html> (“Visant Strategies have forecast that revenue from 60 GHz and 70/80 GHz PTP radios will reach over \$500 million in 2016, citing growth from 4G base stations driving Gbps speed requirements in dense urban areas. Infonetics Research has published a more bullish prediction; that 70/80 GHz PTP equipment will grow to over \$450 million by 2014.”).

<sup>428</sup> Amendment of Part 101 of the Commission’s Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission’s Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications, *Report and Order, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order*, 26 FCC Rcd 11614, 11623-11630 ¶¶ 16-34 (2011).

Broadband Report, “[m]any [Rural Utilities Service] telecommunications borrowers have built fiber capacity throughout rural areas that provide much-needed backhaul to wireless providers as well as public safety entities.”<sup>429</sup> Additional funding, from sources such as the Universal Service Fund, should also be provided to support next-generation backhaul services to rural Americans.

In sum, the facts on wireless backhaul competition show that this is a well-functioning marketplace, poised to grow even more competitive as capacity needs increase. Far from constraining competition among wireless carriers, the backhaul market facilitates competition by enabling carriers to meet their backhaul needs in a variety of ways through a growing number of backhaul providers.

### **C. The Infrastructure Sector Is Highly Competitive and Expanding in Response to Heightened Demand**

Infrastructure continues to play an important competitive role in the economics of wireless networks, especially given the expansion of wireless broadband. As noted by Chairman Genachowski during the Commission’s Broadband Acceleration Conference, “building a robust 21st century communications infrastructure is essential to growing our economy, creating jobs, and our global competitiveness.”<sup>430</sup> Simply put, “[w]e can’t get to next generation broadband (4G) without new towers or new antennas.”<sup>431</sup>

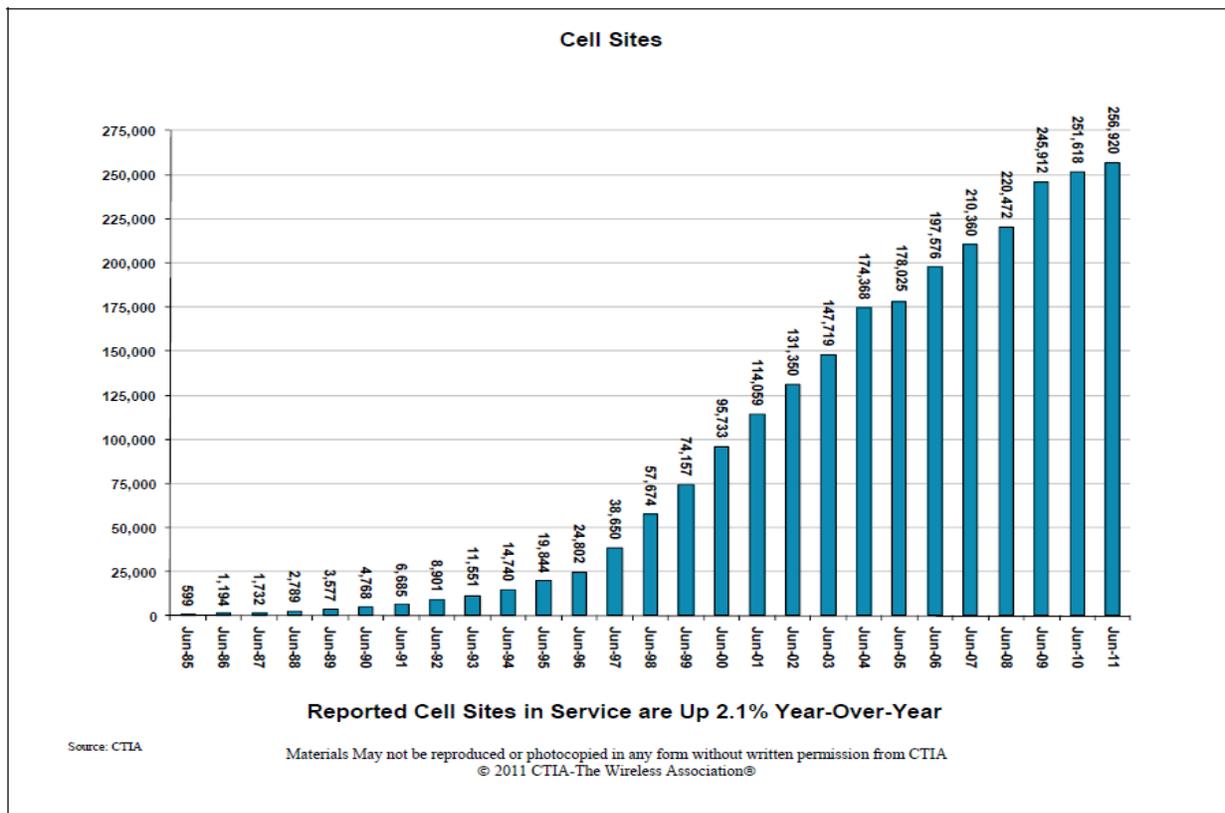
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<sup>429</sup> Chairman Genachowski Releases Update to 2009 Rural Broadband Report, *Public Notice*, 26 FCC Rcd 8680, 8697 ¶ 24 (2011) (containing a report to Congress entitled BRINGING BROADBAND TO RURAL AMERICA: UPDATE TO REPORT ON A RURAL BROADBAND STRATEGY).

<sup>430</sup> See Chairman Julius Genachowski, Federal Communications Commission, Broadband Acceleration Conference, Washington, DC, Prepared Remarks 1 (Feb. 9, 2011), [http://www.fcc.gov/Daily\\_Releases/Daily\\_Business/2011/db0209/DOC-304571A1.pdf](http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0209/DOC-304571A1.pdf) (“Genachowski February 9th Remarks”).

<sup>431</sup> Federal Communications Commission, A National Strategy: The FCC’s Broadband Acceleration Initiative, at 2 (Feb. 9, 2011), [http://www.fcc.gov/Daily\\_Releases/Daily\\_Business/2011/db0209/DOC-304571A2.pdf](http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0209/DOC-304571A2.pdf) (“Broadband Acceleration Initiative”).

The market for mobile wireless infrastructure facilities – including not only towers but also the placement of facilities on existing towers, buildings, water towers, or other structures – continues to show healthy competition and growth and, like backhaul, promotes retail wireless competition. One measure of infrastructure growth is the expansion over time in the total number of cell sites, which includes aggregated carrier facilities on towers, buildings, and other structures. According to CTIA, wireless carriers reported a total of 256,920 cell sites in service as of June 2011, 5,302 more than in June 2010 and 59,344 more than in June 2006.<sup>432</sup> This represents a 2.1 percent increase in reported cell sites over a one-year period, and a 30 percent increase over a five-year period:



Source: CTIA 2011 TOP-LINE SEMI-ANNUAL WIRELESS INDUSTRY SURVEY at 9.

<sup>432</sup> CTIA 2011 TOP-LINE SEMI-ANNUAL WIRELESS INDUSTRY SURVEY at 9.

More importantly, this growth has created a diversity of siting options, preventing any one tower company or carrier from controlling the infrastructure market segment. As noted, while the total number of cell sites reported to CTIA includes aggregated carrier facilities on towers, rooftops, and other structures, an examination of the tower segment alone shows a healthy competitive environment. For example, each of the top five independent tower companies owns between 8,700 and 22,000 towers.<sup>433</sup> These five companies – Crown Castle, American Tower, SBA Communications, Global Tower Partners, and TowerCo – are not affiliated with any of the major wireless companies, wireline telcos, or cable MSOs, and are joined by at least ten other independent tower companies that each own at least 300 towers.<sup>434</sup> Thus, competition within this module of the mobile ecosystem reflects the same type of competing value propositions apparent throughout the wireless marketplace.

Two regulatory developments during the past year give further reason to be optimistic about the future of the wireless infrastructure market. First, as referenced above, earlier this year the Commission announced its Broadband Acceleration Initiative and held a Broadband Acceleration Conference, which focused in part on reducing regulatory barriers that have unduly delayed or prevented construction or modification of towers necessary to sustain wireless

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<sup>433</sup> See WirelessEstimator.com, America's Top Tower Companies, [http://www.wirelessestimator.com/t\\_content.cfm?pagename=US-Cell-Tower-Companies-Complete-List](http://www.wirelessestimator.com/t_content.cfm?pagename=US-Cell-Tower-Companies-Complete-List) (last visited Dec. 1, 2011). Crown Castle is the largest tower company in the country, with 22,251 towers nationwide. American Tower is a close second, with 21,644 towers nationwide, followed by SBA Communications (9,290), Global Tower Partners (4,150) and TowerCo. (3,295). Each of these companies own more towers than Verizon Wireless (1,400). Because these figures only include the towers owned by each company, they do not include towers that the companies manage or lease. For example, Global Tower Partners owns, manages or master leases more than 13,000 wireless sites. See Press Release, Global Tower Partners, Global Tower Partners Acquires Centennial Towers CR, SRL (Nov. 8, 2011), <http://www.gtpsites.com/about-gtp/newsroom/2011/global-tower-partners-acquires-centennial-towers-cr,-srl.aspx>.

<sup>434</sup> See WirelessEstimator.com, America's Top Tower Companies, [http://www.wirelessestimator.com/t\\_content.cfm?pagename=US-Cell-Tower-Companies-Complete-List](http://www.wirelessestimator.com/t_content.cfm?pagename=US-Cell-Tower-Companies-Complete-List) (last visited Nov. 17, 2011).

broadband service.<sup>435</sup> Shortly thereafter, the Commission issued its Broadband Acceleration *Notice of Inquiry*, in which it sought “to work with stakeholders ... to identify means of improving rights of way policies and wireless facilities siting requirements.”<sup>436</sup> That proceeding has drawn a large volume of comments and recommendations from wireless companies, tower companies, municipal governments, consumer groups, and others, and Verizon Wireless looks forward to working in cooperation with the Commission as it pursues wireless tower siting reform.<sup>437</sup> Developments such as these promise to ameliorate what has been one of the chief limitations on growth and new entry in the wireless ecosystem – regulatory barriers to the placement of new facilities.

As part of these proceedings, the Commission should take immediate action to start to remove impediments to infrastructure deployment. In particular, local ordinances often impose a number of hoops that providers must jump through before they can upgrade service even where a tower or other such facility has previously been approved. In these instances, providers typically need only to add or change antennas to deploy upgraded broadband services (such as LTE) and do not need to expand or otherwise materially modify the underlying facility that supports the antennas. These types of activities simply do not implicate the core “zoning” interests that

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<sup>435</sup> See Broadband Acceleration Initiative at 1-2.

<sup>436</sup> Acceleration of Broadband Deployment: Expanding the Reach and Reducing the Cost of Broadband Deployment by Improving Policies Regarding Public Rights of Way and Wireless Facilities Siting, *Notice of Inquiry*, 26 FCC Rcd 5384, 5384 ¶ 2 (2011).

<sup>437</sup> See Comments of Verizon and Verizon Wireless, WC Docket No. 11-59, 1 (filed July 18, 2011) (“When localities intentionally or even unintentionally engage in conduct that causes obtaining permission to deploy or to upgrade service to be time-consuming or costly or both, providers and consumers alike in those localities suffer. And such conduct directly hinders the accomplishment of the Commission’s oft-stated goals of widespread broadband deployment that is affordable for consumers. As a result, the Commission should take immediate action to start to remove these impediments.”).

Congress preserved for localities to address.<sup>438</sup> The Commission should declare that these types of activities do not fall within the range of local zoning functions preserved by the Communications Act and do not require local zoning approval where the underlying tower or other such facility was previously approved. They are very different in nature from proposals to materially modify the underlying tower or building, such as by substantially increasing the height of an existing tower or by erecting a second tower at the same location.

In addition to adopting an authoritative construction of the statute to that effect, the Commission can also promote broadband deployment by issuing a policy statement making it clear that subjecting such activities to extensive application and review processes is contrary to the Commission's broadband goals, and by promoting the establishment of model zoning ordinances and supporting legislative initiatives that would confirm that extensive local reviews are not necessary in these circumstances. Furthermore, the Commission should work with other federal agencies to minimize delays for wireless facilities siting projects caused by environmental reviews and to standardize processes and fees for siting wireless facilities on Federal lands.

## **V. THE FIFTEENTH REPORT SUFFERS FROM SERIOUS FLAWS**

The *Fifteenth Report* contained several improvements over the *Fourteenth Report*. For example, it appropriately declined to recreate the misleading "key trends" section from the previous *Report*.<sup>439</sup> The *Fifteenth Report* also reflected a more nuanced understanding of the economics of the mobile broadband ecosystem – in particular the importance of market conduct

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<sup>438</sup> See 47 U.S.C. § 332(c)(7).

<sup>439</sup> See *Fourteenth Report*, 25 FCC Rcd at 11411-13.

and the role played by economies of scale. Verizon Wireless commends the Commission for these improvements. Nevertheless, like its predecessor, the *Fifteenth Report* included several analytical flaws. These should be remedied in the *Sixteenth Report*.

**A. The *Fifteenth Report* Again Errs in Failing to Make an Effective Competition Finding**

Although Congress directed the Commission to report annually on the state of the CMRS market, and to include in each report “an analysis of *whether or not* there is effective competition,”<sup>440</sup> the Commission failed to fulfill this obligation in the *Fifteenth Report*, just as it had failed to do in the *Fourteenth Report*. Instead, the *Report* argued that “the mobile wireless ecosystem is sufficiently complex and multi-faceted that it would not be meaningful to try to make a single, all-inclusive finding regarding effective competition that adequately encompasses the level of competition in the various interrelated segments, types of services, and vast geographic areas of the mobile wireless industry.”<sup>441</sup> It concluded that “[i]t would be overly simplistic to apply a binary conclusion or blanket label to this complex and multi-dimensional industry.”<sup>442</sup> It thus again declined to characterize the market even though each of the first thirteen *Competition Reports* provided *some* assessment of the CMRS market<sup>443</sup> – and each of the

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<sup>440</sup> 47 U.S.C. § 332(c)(1)(C) (emphasis added).

<sup>441</sup> *Fifteenth Report*, 26 FCC Rcd at 9691 ¶ 14.

<sup>442</sup> *Id.*

<sup>443</sup> For example, while the *First Report* (1995) found that the market was “not fully competitive,” the *Second Report* through the *Seventh Report* (1997-2002) found that competition was “emerging” with a trend toward “increased competition.” Implementation of Section 6002(b) of the Omnibus Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *First Report*, 10 FCC Rcd 8844, 8872 ¶ 84 (1995) (“*First Report*”) (“[T]he mobile telephone service segment of the CMRS business is not fully competitive ....”); *Second Report*, 12 FCC Rcd 11266, 11269 (1997) (“[C]ompetition in the mobile marketplace is emerging.”); *Third Report*, 13 FCC Rcd 19746, 19749 (1998) (“[S]ubstantial progress has been made towards a truly competitive mobile telephone marketplace.”); *Fourth Report*, 14 FCC Rcd 10145, 10206 (1999) (“[T]he mobile telephone market has made steady competitive progress.”); *Fifth Report*, 15 FCC Rcd 17660, 17663 (2000) (“[T]he CMRS industry continues to benefit from the effects of increased competition ....”); *Sixth Report*, 16 (continued on next page)

reports issued from 2003 to 2008 had concluded that “the CMRS marketplace is effectively competitive.”<sup>444</sup> The failure to make such a finding is contrary to the statute and fails to reflect the reality of the marketplace – as documented by the Commission’s own *Report*.

What follows are some key facts and data taken *directly from the Fifteenth Report* that tell a very clear story for the 2009-2010 time period – one that reflects the competition, dynamism, and differentiation that is the wireless ecosystem and supports a conclusion of effective competition:

#### Deployment and Investment

- Over 94 percent of the U.S. population is covered by four or more wireless carriers (up from below 91 percent in 2008). Almost 90 percent are served by five or more providers – compared to below 74 percent in 2008 and below 65 percent in 2007. (*Fifteenth Report* Table 5; *Fourteenth Report* Table 4; *Thirteenth Report* Table 1.) 99.8 percent of Americans are covered by at least one facilities-based provider. (¶ 44.)
- 98.5 percent of the U.S. population resides in census blocks covered by 3G or 4G service. Almost 92 percent of Americans are served by at least two mobile broadband providers, up from below 90 percent in 2008 and 72.5 percent a year before. Likewise, almost 82 percent of Americans live in areas covered by three or more mobile broadband providers, up from 76.1 percent the previous year and 50.7 percent the year before. (*Fifteenth Report* Table 7; *Fourteenth Report* Table 7; *Thirteenth Report* Table 10.)
- Regional providers are growing and investing in their networks. For example, MetroPCS expanded its facilities-based coverage from 56 million POPs in October 2008 to approximately 146 million in October 2010. In the fourth quarter 2010, MetroPCS became the first U.S. provider to launch a network using LTE technology,

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FCC Rcd at 13431 (“The past year has continued the positive trends of increased competition in the CMRS industry described in the *Fifth Report*.”); *Seventh Report*, 17 FCC Rcd 12985, 13066 (2002) (“The past year has continued the positive trends of increased competition in the CMRS industry described in previous reports.”).

<sup>444</sup> Implementation of Section 6002(b) of the Omnibus Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Eighth Report*, 18 FCC Rcd 14783, 14876 ¶ 217 (2003); *Ninth Report*, 19 FCC Rcd 20597, 20689 ¶ 225 (2004); *Tenth Report*, 20 FCC Rcd 15908, 15985 ¶ 207 (2005); *Eleventh Report*, 21 FCC Rcd 10947, 11031 ¶ 216 (2006); *Twelfth Report*, 23 FCC Rcd at 2354 ¶ 293; *Thirteenth Report*, 24 FCC Rcd at 6311 ¶ 277.

and as of January 2011 it had launched its LTE in 13 cities. Leap has expanded its coverage from nearly 54 million POPs in October 2008 to 94.2 million POPs by the end of 2009 and offers 3G service across its entire footprint. (¶¶ 69, 70, 115.)

- From 1999 to 2009, wireless industry capex exceeded \$213 billion. (¶ 207.)

### Pricing and Value

- Growth of unlimited prepaid plans and other developments have created “a trend to lower per-minute rates and increased usage and ARPU in prepaid services.” (¶ 95.) Prepaid prices continue to fall as a result of aggressive competition. (¶¶ 96-102.) Prepaid and wholesale service grew from 19.1 percent as a percentage of all subscriptions to 21.8 percent. (¶ 158.) According to UBS, the number of wholesale subscribers grew 55 percent in 2009. (¶ 166.) Wholesale subscribers accounted for 17 percent of total net adds in 2009, up from 4 percent in 2008. (¶ 178.)
- According to Morgan Stanley, text messaging prices declined from \$0.011 per message in 2008 to \$0.009 in 2009. (¶ 193 and Table 21.)
- Total mobile wireless ARPU dropped nearly 3 percent, from \$47.09 to \$45.85, with voice service ARPU dropping 9 percent from \$36.98 to \$33.54. (¶ 203)
- Although average monthly data traffic per subscriber grew 78 percent, from 138 MB in 2008 to 245 MB in 2009, wireless data service ARPU rose only 22 percent from \$10.11 in 2008 to \$12.30 in 2009. (¶¶ 186, 203.)
- American consumers enjoy lower prices than consumers in nearly all other nations: Voice revenue per minute (“RPM”) equaled \$0.04 in the U.S., compared to \$0.09 in Canada, \$0.11 in the United Kingdom, \$0.16 in Germany, \$0.09 in South Korea, and \$0.25 in Japan. (Table 44.)

### Innovation and Growth

- Mobile wireless connections increased four percent in 2009 to 290.7 million, which translates into a nationwide penetration rate of 93.5 percent. (¶ 158.)
- MetroPCS and Leap, while smaller than the top four providers, increased their subscriber bases by about 24 percent and 29 percent, respectively, during 2009. (¶ 179.)
- At the end of 2009 there were 55.8 million mobile Internet access subscribers, up from 26.5 million at the end of 2008. (Chart 7.)
- In June 2010, there were 21 handset manufacturers offering devices in the U.S., up from 16 in June 2009. (Table 29.) These manufacturers offered a total of 302 handset models. (¶ 326.) Ten handset manufacturers offered a total of 144 smartphones in June 2010, up from 56 in 2009. (¶ 327.)

- Mobile applications continue to proliferate aggressively. Apple’s App Store, for example, makes about 400,000 mobile applications available, and users have downloaded 9 billion applications from Apple. (Chart 45.)
- With the increasing prevalence of WiFi enabled handsets, such as the iPhone, hotspot usage by handsets has increased significantly. According to one study, handsets accounted for 35 percent of all hotspot connections in 2009, up from 20 percent in 2008, and are projected to account for half of all hotspot connections by 2011. (¶ 375.)

### Consumer Satisfaction

- A Commission study found that 58 percent of personal mobile phone users said they were *very satisfied* with reception; another 29 percent were *somewhat* satisfied. Overall, 87 percent of users are at least somewhat satisfied with the coverage of their signal. (¶ 224.)
- Consumer Reports surveyed customers regarding satisfaction, finding that four out of five conventional contract providers scored between 60 (“fairly well satisfied”) and 80 (“very satisfied”). (¶ 225.)

Together, these facts continue the year-over-year trends reflected in prior reports, and amply demonstrate that the mobile wireless market is effectively competitive.

### **B. The *Fifteenth Report’s* Spectrum Analysis Is Unsubstantiated and Unsound**

The *Fifteenth Report’s* spectrum analysis repeats three critical errors that appeared for the first time in the *Fourteenth Report*. First, it incorrectly continues to exclude MSS and WCS spectrum from its competitive spectrum analysis. As the Commission has recognized, this spectrum is suitable for the provision of mobile wireless and broadband services, and therefore should be included in any commercial mobile spectrum review. Second, the *Fifteenth Report* departs from longstanding Commission policy not to differentiate among mobile wireless spectrum bands in competitive analyses. While the favorable propagation characteristics of lower band spectrum can enhance network coverage, this does not make it more advantageous *per se*: higher band spectrum has a number of unique benefits to improve network capacity – and

today, the need to increase capacity is essential. Finally, the *Report* fails to consistently attribute Clearwire spectrum to Sprint Nextel dispute its majority ownership stake.

**1. The *Fifteenth Report* Continues to Wrongly Exclude MSS and WCS Spectrum Suitable for Mobile Services**

The *Fifteenth Report* paints a confused picture of what spectrum is considered as part of its analysis of competition in the mobile wireless market. On the one hand, its analysis references consideration of spectrum “suitable” for the provision of mobile wireless services<sup>445</sup> – the standard used to analyze the competitive effects of transactions.<sup>446</sup> Elsewhere, it discusses spectrum bands “potentially available” for mobile wireless services<sup>447</sup> – the standard used in prior Competition Reports.<sup>448</sup> While slightly different, both take into account spectrum that may be but is not yet used to provide mobile wireless service. Inexplicably, then, the *Fifteenth Report* continues to exclude MSS and WCS spectrum from its spectrum competition analyses, including the charts and tables presented.<sup>449</sup>

The *Report* acknowledges that the MSS bands “may later be used for the provision of mobile voice and broadband services,” citing LightSquared’s plans to construct a 4G mobile broadband network using its ATC authority.<sup>450</sup> Yet, the *Report* declines to consider MSS

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<sup>445</sup> See *Fifteenth Report*, 26 FCC Rcd at 9830 ¶ 288, 9833 ¶ 291, 9840-41 ¶ 306.

<sup>446</sup> See *id.* at 9827-28 ¶ 281, 9840-41 ¶ 306.

<sup>447</sup> See *id.* at 9891, App. A, ¶ 1; see also *id.* at 9825 tbl.26 (identifying “Spectrum Potentially Usable for Mobile Wireless Services”).

<sup>448</sup> See *Thirteenth Report*, 24 FCC Rcd at 6222-23 ¶ 69, 6224 tbl.5; *Twelfth Report*, 23 FCC Rcd at 2276-77 ¶ 77, 2277 tbl.8.

<sup>449</sup> See *Fifteenth Report*, 26 FCC Rcd at 9830-41 ¶¶ 286-307. The *Report* states without elaboration: “The data in these tables do not include MSS spectrum holdings. Nor do they include WCS spectrum holdings. WCS spectrum is currently licensed to several providers, including AT&T, Horizon Wi-Com, NextWave, NTELOS, Sprint Nextel, and Windstream. Additional information on WCS licensees can be accessed using the Spectrum Dashboard located on the Commission’s website ....” *Id.* at 9830 n.833.

<sup>450</sup> See *id.* at 9825-26 ¶ 277.

spectrum as part of its spectrum competition analysis “because ... services offered in these bands do not impact competition in mobile wireless services.”<sup>451</sup> With respect to WCS, the *Report* acknowledges that revised rules adopted in 2010 “will enable WCS licensees to offer mobile broadband services.”<sup>452</sup> Nevertheless, WCS spectrum is also excluded from the *Report’s* spectrum competition analyses.<sup>453</sup> As discussed below, the MSS and WCS bands are both suitable and available to provide mobile service and compel their inclusion in any wireless spectrum competition analysis.<sup>454</sup> Moreover, the Commission cannot logically exclude MSS spectrum from its assessment of the market after justifying approval of at least one MSS venture on the ground that it will enhance terrestrial mobile competition.

**a. The Exclusion of Spectrum Suitable for Mobile Service Defies Precedent**

The *Fifteenth Report’s* decision to exclude from its competitive analysis spectrum that is not currently being used – despite its potential and suitability to do so – is inconsistent with precedent. As noted, prior Competition Reports have considered spectrum bands “potentially available” for mobile wireless services as part of the competition report analysis before they actually became available for such use. For example, the Commission considered 700 MHz

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<sup>451</sup> *See id.* at 9826 ¶ 277. The *Fourteenth Report* took a similar approach, excluding both MSS and WCS spectrum on this basis. *See Fourteenth Report*, 25 FCC Rcd at 11565 ¶ 259. By contrast, both the *Twelfth Report* and the *Thirteenth Report* included substantive discussions of MSS and WCS spectrum, *see Twelfth Report*, 23 FCC Rcd at 2286 ¶¶ 97, 2345-52 ¶¶ 259-88; *Thirteenth Report*, 24 FCC Rcd at 6235-36 ¶¶ 95-96, 6298-310 ¶¶ 240-73, and every Competition Report since the *First Report* has included a discussion of satellite providers. *See, e.g., First Report*, 10 FCC Rcd at 8858 ¶¶ 42-43.

<sup>452</sup> *Fifteenth Report*, 26 FCC Rcd at 9825 ¶ 276.

<sup>453</sup> *See id.* at 9830-41 ¶¶ 286-307.

<sup>454</sup> Also unclear is the extent to which the Commission’s spectrum competition analysis includes the 1.9 GHz spectrum given to Sprint Nextel as part of the 800 MHz rebanding proceeding. That spectrum is included in Table 26 (“Spectrum Potentially Usable for Mobile Wireless Services”), but it is unclear whether the spectrum is also accounted for in the discussion of Sprint Nextel’s PCS holdings in Table 27 (“Percentage Spectrum Holdings”) and Paragraph 301. *Compare Fifteenth Report*, 26 FCC Rcd at 9825 tbl.26 with *id.* at 9831 tbl.27 & 9838 ¶ 301.

spectrum in the *Eighth* (2003), *Ninth* (2004), *Tenth* (2005) and *Eleventh* (2006) *Competition Reports*, even though the 700 MHz auction (Auction No. 73) did not occur until 2008. Similarly, the Commission discussed AWS spectrum in the *Ninth* (2004) and *Tenth* (2005) *Competition Reports*, even though the AWS auction (Auction No. 66) did not occur until 2006.

Moreover, the exclusion is inconsistent with the Commission’s analogous competition policies with respect to spectrum holdings, which look to whether spectrum is “suitable” to provide mobile services and has the “potential” to support comparable service. Starting in 1994, prior to auctioning and licensing broadband PCS spectrum, the Commission imposed a cap on the amount of spectrum an entity could aggregate in a given area.<sup>455</sup> The cap limited the aggregation of cellular, PCS and SMR spectrum – all spectrum with the “*potential to ... offer*” or “*capab[ility] of offering*” service comparable to that provided by cellular systems.<sup>456</sup> In other words, the spectrum cap took into account not just spectrum then used to provide cellular-type services, but also spectrum like PCS with the potential or capability to provide such services.

After phasing out the spectrum cap,<sup>457</sup> the Commission adopted a “spectrum screen” in 2004 to help flag competitive concerns in transactions – once again including all “suitable” spectrum.<sup>458</sup> The Commission included, in its evaluation of potential competitive harms, spectrum that is “*suitable for the provision of mobile telephony services.*”<sup>459</sup> “Suitability” is

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<sup>455</sup> Implementation of Sections 3(n) and 332 of the Communications Act, *Third Report and Order*, 9 FCC Rcd 7988, 7999 ¶ 16, 8100-8110 ¶¶ 238-65 (1994).

<sup>456</sup> See *id.* at 8109 ¶ 261, 8105 ¶ 252 & n.480 (emphasis added).

<sup>457</sup> See 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services, *Report and Order*, 16 FCC Rcd 22668, 22669-71 ¶¶ 2-6 (2001).

<sup>458</sup> See *AT&T-Cingular Order*, 19 FCC Rcd at 21568-69 ¶ 109. The screen identifies markets in which spectrum aggregation exceeds a predetermined amount.

<sup>459</sup> *Id.* at 21560-61 ¶ 81 (emphasis added).

determined based on “whether the spectrum is capable of supporting mobile service given its physical properties and the state of equipment technology, whether the spectrum is licensed with a mobile allocation and corresponding service rules, and whether the spectrum is committed to another use that effectively precludes its use[] for mobile telephony.”<sup>460</sup> In 2004, the spectrum that met this standard included cellular, PCS, and SMR spectrum.<sup>461</sup> At that time, the Commission declined to include other spectrum, such as AWS and MDS (now BRS) spectrum, as it did not meet the suitability criteria “because it is committed to non-mobile telephony uses currently and for the near-term future.”<sup>462</sup>

By 2007, the FCC determined that 700 MHz spectrum should be part of its spectrum input analysis even though much of it had yet to be auctioned: “700 MHz spectrum ... is ... capable of supporting mobile services .... We are also confident at this point in time that it will be licensed and available on a nationwide basis in the sufficiently near-term – less than a year and a half ....”<sup>463</sup> While the Commission continued to exclude AWS and BRS spectrum in 2007 because it was committed to other uses,<sup>464</sup> by 2008 circumstances had changed. Citing “sufficient progress ... in clearing AWS-1 spectrum” and “significant additional progress ... in completing the transition of BRS spectrum to the new band plan,”<sup>465</sup> the Commission included

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<sup>460</sup> *AT&T-Dobson Order*, 22 FCC Rcd at 20311 ¶ 26.

<sup>461</sup> *AT&T-Cingular Order*, 19 FCC Rcd at 21560-61 ¶ 81.

<sup>462</sup> *Id.* at 21561 n.283.

<sup>463</sup> *AT&T-Dobson Order*, 22 FCC Rcd at 20313 ¶ 31.

<sup>464</sup> *Id.* at 20314 ¶ 32 (“At this time, however, we find it is not appropriate to include other spectrum bands – particularly AWS-1 and BRS spectrum – in the initial spectrum screen that we apply to the input markets for mobile telephony spectrum. These bands do meet one of the criteria for suitability.... [T]his spectrum is currently committed to another use that effectively precludes it [sic] use for mobile telephony, and it is unclear whether it will be available for mobile use in the sufficiently near-term”).

<sup>465</sup> *Sprint Nextel-Clearwire Order*, 23 FCC Rcd at 17597 ¶ 66, 17599 ¶ 72.

AWS and BRS spectrum as part of its spectrum screen.<sup>466</sup> Notably, it concluded that spectrum should be a relevant input “*if it will meet the criteria for suitable spectrum within two years.*”<sup>467</sup>

In sum, under the Commission’s spectrum competition policies, spectrum is considered as part of a competition analysis if, within two years, it *will* be “suitable” for the provision of mobile telephony or broadband service – meaning it is capable of supporting mobile service, has been licensed for mobile use, and is not committed to a use that precludes mobile operations. Under such a forward-looking approach, MSS and WCS spectrum should be included in any competition analysis.

**b. MSS ATC Spectrum Is Suitable to Provide, and Has the Potential to Compete with, Mobile Services**

As a threshold matter, while the Commission has found MSS and terrestrial mobile wireless service to be imperfect substitutes,<sup>468</sup> this is not the case with MSS ATC. Even the *Fifteenth Report* recognizes that MSS ATC services “could potentially enhance competition in the provision of mobile terrestrial wireless services.”<sup>469</sup> In fact, the FCC has taken a number of steps – all *prior* to issuance of the *Fifteenth Report* – that make MSS ATC spectrum clearly “suitable” to provide mobile services near-term.

First, the National Broadband Plan, released well prior to the *Fifteenth Report*, recommended that the FCC take further steps to “accelerate terrestrial deployments in the MSS

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<sup>466</sup> The Commission also considers a broader relevant market that includes both mobile telephony and mobile broadband. *See id.* at 17596 ¶ 61 (“In light of recent developments and our determination to evaluate the broader combined market for mobile telephony/broadband services in our competitive analysis, we decide to include AWS-1 and certain BRS spectrum in an updated, market-specific initial spectrum screen in those markets where that spectrum is available.”).

<sup>467</sup> *Id.* (emphasis added).

<sup>468</sup> *See Thirteenth Report*, 24 FCC Rcd at 6301 ¶ 247.

<sup>469</sup> *Fifteenth Report*, 26 FCC Rcd at 9702 ¶ 39.

bands.”<sup>470</sup> In response, the FCC in 2010 released a *Notice of Proposed Rulemaking and Notice of Inquiry* that seeks to “remove regulatory barriers to terrestrial use, and to promote additional investments, such as those recently made possible by a transaction between Harbinger Capital Partners and SkyTerra Communications.”<sup>471</sup> That item makes clear the competition MSS ATC services will provide:

As Globalstar, SkyTerra/Harbinger, and other MSS providers realize their plans to offer high-speed broadband services to consumers using terrestrial networks under their ATC authority, *the services they offer have the potential to expand the services offered in the overall market of mobile terrestrial wireless services and enhance competition in this larger mobile marketplace.*<sup>472</sup>

Second, in April 2011, the Commission adopted an order adding co-primary terrestrial Fixed and Mobile allocations to the 2 GHz band and applying its existing terrestrial secondary market spectrum leasing policies to MSS ATC leasing arrangements “[i]n contemplation of [MSS] spectrum being used for wireless services.”<sup>473</sup> The Commission extended the leasing rules based on a finding that “recent and planned near-term developments in the use of MSS/ATC spectrum for the provision of terrestrial services are increasing the potential that these services will become sufficiently similar to the services offered in the overall market of mobile terrestrial wireless services to enhance competition in this larger mobile marketplace.”<sup>474</sup>

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<sup>470</sup> NATIONAL BROADBAND PLAN at 88.

<sup>471</sup> Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz, *Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 9481, 9481 ¶ 1 (2010).

<sup>472</sup> *Id.* at 9490-91 ¶ 21 (emphasis added).

<sup>473</sup> Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz, *Report and Order*, 26 FCC Rcd 5710, 5710 ¶ 1 (2011).

<sup>474</sup> *Id.* at 5716 ¶ 14.

Accordingly, the Commission found that conforming terrestrial and MSS ATC leasing policies “will promote greater consistency, regulatory parity, predictability, and transparency” with respect to these similar offerings.<sup>475</sup>

Third, in March 2010, the Commission approved applications transferring control of LightSquared (then known as SkyTerra) to Harbinger.<sup>476</sup> The approval was conditioned on Harbinger’s commitment “to build a terrestrial network using [LightSquared]’s ATC authorizations.”<sup>477</sup> That network will be “an additional, nationwide facilities-based mobile broadband network” able to “provide service at 4G speeds to over 90 percent of the U.S. population.”<sup>478</sup> The Commission approved the transaction “because of the competition it will bring in mobile wireless broadband services,” specifically noting Harbinger’s expectation that LightSquared’s service “will enhance competition in the provision of terrestrial mobile broadband services, including those provided by AT&T and Verizon Wireless.”<sup>479</sup> The company is required to provide coverage to at least 100 million people in the U.S. by December 2012 and 260 million people by December 2015.<sup>480</sup> As noted above, despite challenges related to potential interference with GPS receivers,<sup>481</sup> LightSquared continues to move forward with its plans.<sup>482</sup>

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<sup>475</sup> *See id.*

<sup>476</sup> SkyTerra Communications, Inc. and Harbinger Capital Partners Funds, *Memorandum Opinion and Order and Declaratory Ruling*, 25 FCC Rcd 3059, 3060 ¶ 1 (IB/OET/WTB 2010). References herein to LightSquared include SkyTerra and other predecessors-in-interest, as appropriate.

<sup>477</sup> *Id.* at 3089 ¶ 72.

<sup>478</sup> *Id.* at 3088 ¶ 68. Harbinger has stated that in addition to its use of MSS ATC spectrum, its terrestrial broadband mobile 4G LTE network at the outset will also “consist[] of 8 MHz of 1.4 GHz terrestrial spectrum, [and] access to 5 MHz of 1.6 GHz terrestrial spectrum.” *Id.* at 3096, App. B. Because this spectrum is also suitable for and able to be used to compete with mobile services, it should also be included in the CMRS spectrum analysis.

<sup>479</sup> *Id.* at 3088 ¶¶ 68, 70.

<sup>480</sup> *Id.* at 3098, App. B.

<sup>481</sup> In a separate proceeding, LightSquared received a waiver of the FCC’s MSS ATC integrated service rule to allow the company’s wholesale customers to provide terrestrial-only services to end users, conditioned on the outcome of (continued on next page)

Fourth, between January 2009 and January 2010, the Commission granted ATC authority to the two 2 GHz MSS (S-Band) licensees, DBSD and TerreStar, allowing them to provide terrestrial mobile services.<sup>483</sup> As discussed previously, the FCC is currently considering DISH's plans to acquire the assets of DBSD and TerreStar, including their ATC authorizations, so that DISH can "launch a hybrid satellite and terrestrial mobile and fixed-broadband network (MSS/ATC)."<sup>484</sup>

Finally, in October 2008, the FCC modified the ATC authority of Globalstar and granted it certain interim waivers of the ATC gating criteria, permitting Globalstar to deploy ATC services.<sup>485</sup> While that authority is currently suspended pending completion of Globalstar's second generation satellite network and compliance with the gating criteria,<sup>486</sup> Globalstar

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ongoing proceedings to ensure GPS services will not suffer harmful interference. *See* LightSquared Subsidiary LLC Request for Modification of its Authority for an Ancillary Terrestrial, *Order and Authorization*, 26 FCC Rcd 566, 566 ¶ 1 (IB 2011).

<sup>482</sup> *See, e.g.*, LightSquared, About Us, <http://www.lightsquared.com/about-us/> (last visited Dec. 1, 2011).

<sup>483</sup> TerreStar Networks Inc., *Order and Authorization*, 25 FCC Rcd 228, 238 ¶ 30 (IB 2010) (noting that "TerreStar proposes to provide Commercial Mobile Radio Service ('CMRS') via its ATC facilities"); New ICO Satellite Services G.P., *Order and Authorization*, 24 FCC Rcd 171, 171 ¶ 1 (IB 2009) (granting authority to "operate dual-mode mobile terminals that can be used to communicate either via ICO's geostationary-orbit Mobile Satellite Service ('MSS') satellite ... or via ancillary terrestrial component ('ATC') base stations").

<sup>484</sup> *Dish-DBSD-TerreStar Public Notice*, 26 FCC Rcd at 13021.

<sup>485</sup> Globalstar Licensee LLC, *Order and Authorization*, 23 FCC Rcd 15975, 15975 ¶ 1 (2008). Indeed, pursuant to an ATC spectrum lease with Globalstar, Open Range deployed a terrestrial broadband network covering several hundred thousand rural residents. Although the FCC authorized Open Range to continue its service while Globalstar's ATC authority was suspended, *see* Policy Branch Information, *Public Notice*, 26 FCC Rcd 13504, 13504 (2011) (SAT-STA-20110819-00163), the company recently declared bankruptcy. Phil Milford, *Open Range, Rural Wireless Provider, Files for Bankruptcy*, BLOOMBERG, Oct. 6, 2011, <http://www.bloomberg.com/news/2011-10-06/open-range-rural-wireless-provider-files-for-bankruptcy-1-.html>. The Open Range service, however, showed that the MSS spectrum is suitable for terrestrial wireless service.

<sup>486</sup> *See* Globalstar Licensee LLC, *Order*, 25 FCC Rcd 13114, 13115 ¶ 1 (IB/WTB/OET 2010).

recently stated that it has made substantial progress toward the completion of its new satellite network and expects to launch its final six satellites in early 2012.<sup>487</sup>

Each of these steps underscores yet again why MSS spectrum must be included as an input in any CMRS competition analysis.

**c. WCS Spectrum Is Suitable to Provide, and Has the Potential to Compete with, Mobile Services**

In addition, the Commission amended the WCS rules in 2010 to “*immediately make 25 megahertz of spectrum available for mobile broadband services.*”<sup>488</sup> The Commission took these steps to “*promote broadband competition and facilitate the development and provision of innovative broadband services, including mobile broadband services, to the American public in the 2305-2320 and 2345-2360 MHz bands allocated to WCS.*”<sup>489</sup> The FCC also established aggressive buildout requirements that require WCS licensees providing mobile services to serve 40 percent of a license area’s population within 42 months, and 75 percent within 72 months.<sup>490</sup> Thus, according to the Commission, WCS spectrum is suitable to provide, and has the potential

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<sup>487</sup> See, e.g., Reply Comments of Globalstar, Inc., IB Docket No. 11-149, ET Docket No. 10-142, at 4 n.11 (filed Nov. 8, 2011) (“Over the past year, Globalstar has launched the first twelve satellites of its second-generation MSS constellation, and it plans two additional launches of six satellites each, one in December 2011 and the other early in 2012. Once operational, Globalstar’s state-of-the-art second-generation MSS network should support reliable and effective voice and data services to consumers, public safety personnel, and other customers in the U.S. and internationally.”).

<sup>488</sup> News Release, FCC, FCC Unleashes 25 MHz of Spectrum for Mobile Broadband Use (May 20, 2010), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-298308A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-298308A1.pdf) (emphasis added).

<sup>489</sup> Amendment of Part 27 of the Commission’s Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, *Report and Order and Second Report and Order*, 25 FCC Rcd 11710, 11725 ¶ 36 (2010) (emphasis added), *recon. pending*.

<sup>490</sup> *Id.* at 11713 ¶ 3.

to compete with, mobile services – as even the *Fifteenth Report* concedes.<sup>491</sup> Accordingly, WCS spectrum must be included in the FCC’s overall analysis of spectrum holdings.

## **2. No Basis Exists for Affording Any Competitive Significance to a 1 GHz Threshold**

The *Fifteenth Report* observes that the favorable propagation characteristics of lower band spectrum “allow for better coverage across larger geographic areas,” whereas higher band spectrum “may be well suited for adding capacity.”<sup>492</sup> Despite the *Report*’s recognition that both lower and higher bands provide significant benefits,<sup>493</sup> it repeats the *Fourteenth Report*’s unexplained conclusion that spectrum below 1 GHz affords “competitive advantages” over spectrum above 1 GHz.<sup>494</sup> This treatment places undue weight on benefits of lower band frequencies and is particularly misguided given that most demand for spectrum today is due to capacity constraints<sup>495</sup> – a need that can be addressed with higher band spectrum.

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<sup>491</sup> *Fifteenth Report*, 26 FCC Rcd at 9825 ¶ 276 (stating that the revised rules “will enable WCS licensees to offer mobile broadband services”).

<sup>492</sup> *Id.* at 9832 ¶ 289.

<sup>493</sup> *Compare Fifteenth Report*, 26 FCC Rcd at 9833 ¶ 292 (stating that the favorable propagation characteristics of lower band spectrum allow it to “provide superior coverage over larger geographic areas,” making it “ideal for delivering advanced wireless services to rural areas”) (quoting Service Rules for the 698-746, 747-762, and 777-792 MHz Bands, *Second Report and Order*, 22 FCC Rcd 15289, 15349 ¶ 158 (2007)) with *Fifteenth Report*, 26 FCC Rcd at 9837 ¶ 296 (finding that higher-frequency spectrum “can be ideally suited for providing high capacity where it is needed, such as in high-traffic urban areas”).

<sup>494</sup> *Fifteenth Report*, 26 FCC Rcd at 9841 ¶ 307; *Fourteenth Report*, 25 FCC Rcd at 11577 ¶ 283.

<sup>495</sup> See NATIONAL BROADBAND PLAN at 77 (finding that “[t]he growth of wireless broadband will be constrained if government does not make spectrum available”); FCC, MOBILE BROADBAND: THE BENEFITS OF ADDITIONAL SPECTRUM, OBI TECHNICAL PAPER NO. 6, 18 (Oct. 2010) (“[M]obile data demand will exceed available capacity by 2013, and will reach a nearly 300 MHz deficit by 2014.”), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-302324A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-302324A1.pdf); *id.* at 13 (“[W]e assume all future cell site growth will emphasize capacity over coverage, which is also conservative from the standpoint of estimating spectrum needs since new coverage sites do not address capacity constraints.”); *id.* at 20 (“[I]ncreasing network density through the addition of cell-sites is the primary substitute to new spectrum for adding broadband capacity to the network.”); FCC Office of Intergovernmental Affairs, Webinar: The National Broadband Plan 7 (May 25, 2010) (noting that there is “[i]nsufficient capacity for broadband” and recommending that the government “[m]ake more spectrum available”), [http://reboot.fcc.gov/c/document\\_library/get\\_file?uuid=aecda170-3dc2-4c35-80b9-bbacd984ea4c&groupId=19001](http://reboot.fcc.gov/c/document_library/get_file?uuid=aecda170-3dc2-4c35-80b9-bbacd984ea4c&groupId=19001).

Historically, the Commission’s competition policies concerning spectrum have never differentiated among bands based on propagation characteristics. As the Commission explained in 2008:

[E]ver since the Commission first determined to evaluate potential spectrum aggregation of 800 MHz cellular spectrum, 800/900 MHz SMR, and 1.9 GHz broadband PCS spectrum for purposes of competitive review, *it has not differentiated among bands based on specific propagation characteristics or purported distinctions in trading value.* Nor did we do so last year when we recently expanded the initial spectrum aggregation screen to include 700 MHz band spectrum. We decline to do so here with respect to the particular BRS spectrum that we find, below, suitable for mobile telephony/broadband services.<sup>496</sup>

Like the *Fourteenth Report* before it, the *Fifteenth Report* departs from that policy without ever acknowledging it is doing so. As Verizon Wireless detailed in last year’s comments, there is no competition policy basis to distinguish between mobile spectrum bands on the basis of propagation characteristics.<sup>497</sup>

**a. The *Fifteenth Report* Places Insufficient Weight on the Capacity Benefits of Higher Band Spectrum**

As a threshold matter, the *Report* recognizes that “higher-frequency spectrum may be just as effective, or more effective, for providing significant capacity, or increasing capacity, within smaller geographic areas.”<sup>498</sup> It nonetheless goes on to find competitive advantages for lower band spectrum. Yet, as shown below, higher band spectrum can expand capacity, is often available in larger blocks, and can enhance network performance.

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<sup>496</sup> Sprint Nextel Corporation and Clearwire Corporation, *Memorandum Opinion and Order*, 23 FCC Rcd 17570, 17597 ¶ 63 (2008) (“*Sprint Nextel-Clearwire Order*”) (emphasis added).

<sup>497</sup> See Verizon Wireless 2010 Competition Comments at 136-38.

<sup>498</sup> *Fifteenth Report*, 26 FCC Rcd at 9836 ¶ 296; see also *id.* at 9837 ¶ 296 (“[H]igher frequency spectrum can be ideally suited for providing high capacity where it is needed ....”).

**Enhanced Capacity.** Carriers that rely heavily or exclusively on spectrum over 1 GHz have emphasized the capacity benefits of upper band spectrum. For example, when touting its spectrum position to investors, Sprint Nextel’s former Chief Technology Officer explained: “the 2.5 gigahertz band spectrum Sprint Nextel’s WiMAX network will use *compares favorably to 700 megahertz band spectrum*. While the lower band enables coverage to be deployed more cheaply initially, *the upper band allows greater overall capacity to handle more subscribers.*”<sup>499</sup> In 2010, T-Mobile similarly stated that “[t]here are certain circumstances where upper band spectrum is as effective as, *or preferred to*, lower band spectrum in providing competitive services, *particularly for enhancing capacity* in highly populated areas,”<sup>500</sup> and advised investors that the company’s significant spectrum holdings in the 1.9 and 1.7/2.1 GHz bands afford it the “[m]ost capacity in the industry.”<sup>501</sup>

**Contiguous Blocks.** These capacity benefits are also attributable to the larger blocks of contiguous spectrum available in the higher bands.<sup>502</sup> As Professor Jeffrey Reed and Dr. Nishith Tripathi have explained, “the use of larger blocks of contiguous spectrum increases the

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<sup>499</sup> Paul Kirby, *Sprint Nextel CTO Offers Vigorous Defense of WiMAX*, TR DAILY, Apr. 22, 2008 (emphasis added) (quoting Barry West, Chief Technology Officer of Sprint Nextel Corporation).

<sup>500</sup> See *Ex Parte* Notice from Russell H. Fox, Counsel for T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 10-133 *et al.*, at 2 (filed Dec. 2, 2010).

<sup>501</sup> ROBERT DOTSON & BRIAN KIRKPATRICK, T-MOBILE USA, INC., DEUTSCHE TELEKOM INVESTOR DAY. T-MOBILE USA: REGAINING U.S. MARKET POSITION 23 (Mar. 18, 2010), [http://www.download-telekom.de/dt/StaticPage/83/41/44/dtag\\_investor\\_day\\_presentation\\_usa\\_dotson\\_834144.pdf](http://www.download-telekom.de/dt/StaticPage/83/41/44/dtag_investor_day_presentation_usa_dotson_834144.pdf) (measured on a “Site\*Hz per Subscriber” basis).

<sup>502</sup> See *Fifteenth Report*, 26 FCC Rcd at 9836-37 ¶ 296 (“[T]here currently is significantly more spectrum above 1 GHz that is potentially available for use ... and, in many parts of these higher bands, spectrum is licensed in larger contiguous blocks. Larger blocks can enable operators to deploy wider channels and simplify device design.”) (internal citation omitted).

achievable throughput per cell.”<sup>503</sup> According to Sprint Nextel and its partner Clearwire, this is critical: the companies’ access to the 120 MHz of spectrum in the higher bands that is needed to provide “true broadband” gives them a competitive “advantage.”<sup>504</sup> For example, in a Sprint Nextel presentation on WiMAX, the company argued:

As WiMAX and LTE use very similar radio technologies, the bandwidth efficiency should be roughly equal and, in the end . . . , having more spectrum available is a far greater advantage than the frequency band it occupies.

Initial LTE services are planned for the 700 MHz spectrum the FCC auctioned in 2008. In each major market, the 700 MHz A- and B-Blocks provide a total of 24 MHz and the C-Block (Open Device Block) has a total of 22 MHz. *Sprint/Clearwire have an average of 120 MHz of 2.5 GHz BRS spectrum in most major markets.*<sup>505</sup>

**Performance.** In addition, some radio systems “may perform better at higher frequencies.”<sup>506</sup> As Dr. Charles Jackson explained in a previous report, “[s]everal closely related aspects of today’s mobile technologies – specifically diversity antennas, smart antennas, and multiple-input, multiple-output (MIMO) – *can be expected to work better at higher frequencies*

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<sup>503</sup> JEFFREY REED AND NISHITH TRIPATHY, COMPARATIVE ANALYSIS OF SUITABILITY OF LOWER AND HIGHER FREQUENCY BANDS FOR CELLULAR NETWORK DEPLOYMENTS 30 (Mar. 17, 2011) (“REED/TRIPATHI COMPARATIVE ANALYSIS”), *appended to* Joint Opposition of AT&T Mobility Spectrum LLC and Qualcomm Incorporated, WT Docket No 11-18 (Mar. 21, 2011 (“AT&T/Qualcomm Opp.”); *see also id.* at 32 (“To the extent a provider is able to amass large (contiguous) blocks of a single (higher) frequency rather than relying upon multiple smaller blocks across multiple frequency bands (e.g., 700 MHz and AWS bands), less equipment may be needed – both in base stations and in end user equipment.”).

<sup>504</sup> John Saw, Clearwire, FCC National Broadband Plan Workshop, Spectrum, Tr. 35:19-21, 36:15-17 (Sep. 17, 2009), [http://www.broadband.gov/docs/ws\\_25\\_spectrum.pdf](http://www.broadband.gov/docs/ws_25_spectrum.pdf) (testifying that “[y]ou’re looking at 120 megahertz . . . of spectrum to really deliver true broadband services” and “you also need to have contiguous blocks of spectrum to really be able to deliver the true . . . broadband experience”).

<sup>505</sup> Sprint Nextel, Mobile WiMAX: The 4G Revolution Has Begun, Version 1.0, 12, [www.wimax.com/whitepapers/sprint-mobile-wimax.pdf](http://www.wimax.com/whitepapers/sprint-mobile-wimax.pdf) (last visited Dec. 5, 2011) (emphasis in original).

<sup>506</sup> *Fifteenth Report*, 26 FCC Rcd at 9836 ¶ 296.

than at lower frequencies.”<sup>507</sup> This is because these advanced antenna systems are most effective if they are well separated, and shorter wavelengths allow more antennas to be used in close proximity while maintaining needed separation.<sup>508</sup> Higher frequencies also can result in significant efficiencies when duplexing equipment is used,<sup>509</sup> allowing LTE/WiMAX operators to maximize the performance of their high-speed services. Finally, higher band spectrum may work better with in-building antenna systems.<sup>510</sup>

More broadly, history has shown that spectrum above 1 GHz has the power to transform the industry. Between 1994 and 2000, the Commission auctioned 120 MHz of broadband PCS spectrum in the 1.9 GHz bands that “made mobile voice communications a mass-market reality and unleashed a tidal wave of innovation and investment.”<sup>511</sup> As the *Fifteenth Report* recognizes, this spectrum “facilitated the growth and development of a more competitive mobile wireless

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<sup>507</sup> See CHARLES JACKSON, THE SUPPLY OF SPECTRUM FOR CMRS 8 (Aug. 19, 2008) (emphasis added), *appended to* Joint Opposition to Petitions to Deny and Comments of Cellco Partnership d/b/a Verizon Wireless and Atlantis Holdings Inc., WT Docket No. 08-95, Att. 4 (filed Aug. 19, 2008).

<sup>508</sup> See *id.* at 9; see also REED/TRIPATHI COMPARATIVE ANALYSIS at 34-35 (“MIMO or Spatial Multiplexing (SM) can likewise significantly increase throughput but requires multiple transmit antennas and multiple receive antennas. At lower frequency bands, it is difficult to ensure adequate ‘separation’ in the handheld device due to the larger wavelengths of lower frequencies. Here, too, while MIMO solutions should work in lower band deployments, the achievable gains are likely to [be] reduced as compared to higher-band deployments.”).

<sup>509</sup> See REED/TRIPATHI COMPARATIVE ANALYSIS at 32. As AT&T has explained, “[a] single duplexer can span a larger block of spectrum at 2.5 GHz, for example, than it could at 700 MHz,” and “[b]roadband technologies, such as LTE and WiMAX, can exploit 20 MHz or more of contiguous spectrum in a single channel to deliver their highest spectral efficiency and highest throughputs.” See *Ex Parte* Notice from Jeanine Poltronieri, AT&T, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 09-66, 3 (filed May 6, 2010).

<sup>510</sup> See REED/TRIPATHI COMPARATIVE ANALYSIS at 30-31, 36. As AT&T notes, “pico cells which cover a building and femto cells which cover a home ... may perform better in high-band systems since the required antenna spacing is less for both the handset and the base station.” AT&T/Qualcomm Opp. at 17.

<sup>511</sup> NATIONAL BROADBAND PLAN at 78.

marketplace.”<sup>512</sup> These transformations demonstrate that higher band spectrum can and has played a significant role in promoting competition.

**b. The *Fifteenth Report* Over-Emphasizes the Importance of Lower Band Propagation Characteristics**

While it is true that spectrum in lower bands has superior propagation characteristics, the *Report* places undue weight on the coverage benefits attributable to lower band spectrum. The view that lower spectrum bands permit less costly deployment is based on the assumption that because lower band signals typically travel farther than higher band signals, fewer cell sites are needed to provide equivalent coverage.<sup>513</sup> As Professor Reed and Dr. Tripathi explain, however, “the number of cells/base stations deployed in a wireless broadband network is influenced by many factors in addition to the intrinsic propagation characteristics of the spectrum used.”<sup>514</sup> First, network deployment needs must take into account not only coverage but also quality of service issues, including capacity and throughput; depending on the circumstances, capacity needs could “diminish or eliminate propagation-related cost advantages.”<sup>515</sup> This is the case in urban areas, for example, where congestion, not coverage, is at issue.

Second, deployments relying on multiple frequency bands must be considered: “If an operator uses both lower- and higher-frequency spectrum for its 4G deployments to meet the target throughput requirements, this could eliminate the lower-frequency propagation advantage,

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<sup>512</sup> *Fifteenth Report*, 26 FCC Rcd at 9823 ¶ 272. The National Broadband Plan described the resulting changes as profound: most markets saw significant increases in the number of wireless providers; price per-minute of mobile phone service dropped by half; mobile subscribers more than tripled; cumulative industry investment more than tripled; cell sites more than quadrupled; and industry employment tripled. See NATIONAL BROADBAND PLAN at 78.

<sup>513</sup> See *Fifteenth Report*, 26 FCC Rcd at 9834-35 ¶ 293.

<sup>514</sup> REED/TRIPATHI COMPARATIVE ANALYSIS at 2.

<sup>515</sup> *Id.*

because effective network planning and seamless mobility typically require contiguous coverage of multiple carrier frequencies across a given geographic area.”<sup>516</sup> Third, obstructions, zoning restrictions, interference considerations, and other restrictions on base station placement may “limit the achievable coverage performance (and associated cell size benefits) in real-world lower frequency networks.”<sup>517</sup> For all these reasons, the low frequency/low cost assumption is a fallacy. As Professor Reed and Dr. Tripathi conclude:

[T]he number of cell-sites required to cover a given area with lower frequency spectrum that propagates particularly well could thus be much higher than the number of cell-sites predicted by a pure coverage-driven deployment or even the hybrid coverage/capacity approaches that have been employed in the past.<sup>518</sup>

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Notably, carriers with spectrum holdings primarily above 1 GHz have achieved population coverage similar to that achieved by carriers with significant spectrum holdings below 1 GHz. For example, Sprint Nextel has achieved near nationwide coverage significantly using its higher band spectrum,<sup>519</sup> and AT&T has been able to provide near complete coverage of the Carolinas and other areas where it only holds higher band spectrum. In fact, as the chart below shows, there is very little difference in POPs covered by AT&T and Verizon, which have more significant spectrum holdings below 1 GHz, and Sprint Nextel and T-Mobile, which have limited holdings or no spectrum at all below 1 GHz:

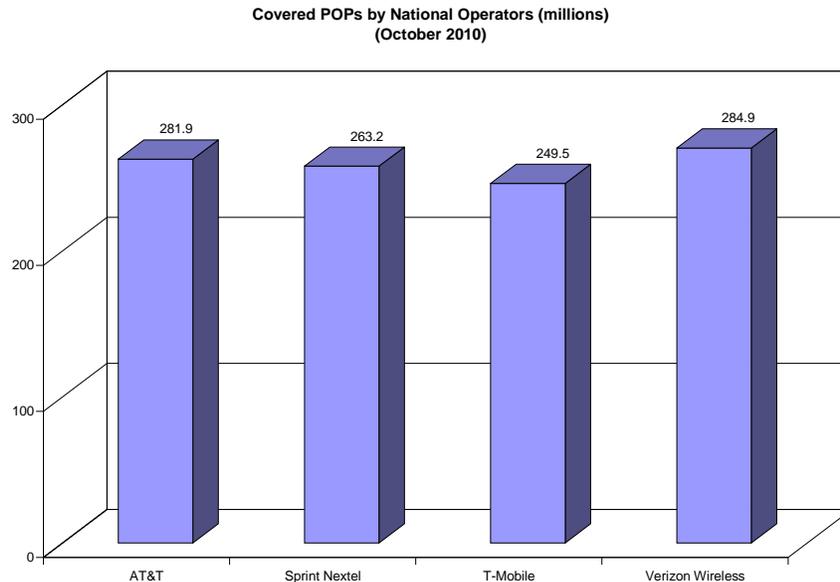
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<sup>516</sup> *Id.* at 2-3.

<sup>517</sup> *Id.* at 3.

<sup>518</sup> *Id.* at 26.

<sup>519</sup> *See* REED/TRIPATHI COMPARATIVE ANALYSIS at 3.



Source: *Fifteenth Report*, Table 1 (Mobile Wireless Network Coverage, Selected Facilities-Based Providers: Voice Networks)

MetroPCS and Leap Wireless are also rapidly deploying advanced services using higher band spectrum.<sup>520</sup> This undercuts the notion that spectrum above 1 GHz creates a competitive disadvantage that inhibits coverage.

**c. The *Fifteenth Report* Uses Incomplete Auction Data as a Proxy for Spectrum Value Above and Below 1 GHz**

The *Fifteenth Report* mistakenly concludes that “[a] comparison of spectrum prices for the recent auctions of AWS and 700 MHz spectrum ... suggests that providers may have placed a higher value on 700 MHz spectrum.”<sup>521</sup> According to the *Report*, the average price for 700 MHz spectrum was \$1.28 per MHz-POP, as compared to \$0.54 per MHz-POP for AWS

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<sup>520</sup> See AT&T/Qualcomm Opp. at 14-15.

<sup>521</sup> *Fifteenth Report*, 26 FCC Red at 9836 ¶ 295.

spectrum.<sup>522</sup> The *Report* uses these results to buttress its conclusion regarding the competitive advantages of spectrum below 1 GHz.

As a threshold matter, the *Report* provides no reason why the results of these two auctions alone are taken out of context and the results of other major auctions ignored. As Verizon Wireless demonstrated in 2010, if all major mobile wireless spectrum auctions since 1995 are considered and prices adjusted for inflation, no price trends between spectrum above and below 1 GHz are discernible.<sup>523</sup> Rather, pricing varies greatly from one auction to the next, even for the same spectrum, as the chart below demonstrates:

Auction No.	Spectrum	Auction End Date	Net Price Per MHz-POP	CPI Adj. Net Price Per MHz-POP
4	PCS (1.9 GHz)	March-95	\$0.46	\$0.66
5	PCS (1.9 GHz)	May-96	\$1.19	\$1.65
10	PCS (1.9 GHz)	July-96	\$1.55	\$2.15
11	PCS (1.9 GHz)	January-97	\$0.29	\$0.40
22	PCS (1.9 GHz)	April-99	\$0.13	\$0.17
35	PCS (1.9 GHz)	January-01	\$3.69	\$4.58
71	PCS (1.9 GHz)	May-07	\$0.21	\$0.22
78	PCS (1.9 GHz)	August-08	\$0.21	\$0.21
66	AWS (1.7/2.1 GHz)	September-06	\$0.54	\$0.58
78	AWS (1.7/2.1 GHz)	August-08	\$0.11	\$0.11
44	700 MHz	September-02	\$0.03	\$0.04
49	700 MHz	June-03	\$0.03	\$0.04
73	700 MHz	March-08	\$1.29	\$1.32

Source: *see generally* <http://wireless.fcc.gov/auctions/>

Notes: Per MHz-POP prices all based on Population Census from 2000; prices based only on licenses from the 50 states (excludes Puerto Rico, American Territories and Gulf of Mexico<sup>524</sup>) and do not include licenses held by the FCC at end of each auction; CPI-adjusted prices reflect June 2010 dollar values (*see* <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>)

<sup>522</sup> *Id.*

<sup>523</sup> *See* Verizon Wireless 2010 Competition Comments at 145-46.

<sup>524</sup> This accounts for the difference between the \$1.29 price per MHz-POP shown above for Auction No. 73 and the \$1.28 price per MHz-POP cited by the FCC in the *Fifteenth Report*. *See supra* n.522 and accompanying text.

The *Fifteenth Report* ignores this data.

While the *Report* acknowledges that “a number of factors in addition to frequency can impact the prices in a particular auction,” it fails to address any of the significant differences between the AWS and 700 MHz auctions that can account for the price differential, focusing instead only on commonalities.<sup>525</sup> In fact, each auction stands alone because of factors related to supply and demand, economic and market conditions, auction format, reserve prices, minimum opening bids, encumbrances, reserves, and cost to clear.

Specifically, there are numerous reasons why the average price for AWS spectrum sold for less in Auction 66 than 700 MHz spectrum in Auction 73. The first is supply: in Auction 66, 90 MHz of mobile spectrum was available but in Auction 73, there was only 52 MHz – even less (46 MHz) if the unpaired 6 MHz E block is excluded. The AWS auction had significantly more spectrum, which likely would decrease demand and thus yield lower prices per MHz-POP.

A second reason is encumbrances: AWS required significant band clearing of federal government use over a period of years, unlike the Auction 73 700 MHz spectrum. A more apt comparison would be the lower 700 MHz spectrum auctioned in Auctions 44 and 49 (see chart above), which at the time was weighed down by uncertainty surrounding the timing for clearing TV stations from the band – uncertainty that depressed participation in the auction and is reflected in the low price of the spectrum. Even within Auction 73, the price of spectrum varied greatly based on demand, open access conditions, and encumbrances. However, if price was the

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<sup>525</sup> *Fifteenth Report*, 26 FCC Rcd at 9836 ¶ 295 (“Although a number of factors in addition to frequency can impact the prices in a particular auction, including factors unrelated to technical characteristics of the spectrum, both auctions involved large quantities of paired spectrum with similar service rules in a relatively close timeframe, eliminating at least some of the other factors that could reduce the significance of the comparison.”).

sole determinant of spectrum quality, the 700 MHz Lower C Block from Auctions 44 and 49 would be 30-35 times “worse” than the rest of the 700 MHz band.

A third reason why auction prices vary is economic and market conditions. There was an explosion in data and broadband use between the 2006 AWS auction and the 2008 700 MHz auction, which substantially increased spectrum demand by 2008. The PCS auctions provide a useful comparison, showing a wide range of spectrum values under different economic conditions and other factors (including, among others, spectrum block size, designated entity restrictions for certain spectrum, and government-offered financing). Thus any effort to draw support for the 1 GHz line based on auction results is invalid.

### **3. The *Fifteenth Report* Does Not Consistently Attribute Clearwire Spectrum to Sprint Nextel**

The *Fourteenth Report* recognized that Sprint Nextel held a majority interest in Clearwire,<sup>526</sup> and that Sprint Nextel was reselling 4G service powered by Clearwire’s WiMAX network,<sup>527</sup> but presented its findings regarding spectrum holdings in a way that disaggregated the spectrum controlled by the two companies.<sup>528</sup> As Verizon Wireless stated in its comments prior to the *Fifteenth Report*, this presentation of data had the effect of suggesting that Verizon Wireless and AT&T had access to more spectrum than Sprint Nextel, which is not the case.<sup>529</sup> The *Fifteenth Report* partly remedied this problem, stating:

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<sup>526</sup> *Fourteenth Report*, 25 FCC Rcd at 11461 ¶ 69, 11483 ¶ 113.

<sup>527</sup> *Id.* at 11483 ¶ 113.

<sup>528</sup> *Id.* at 11568-70 ¶ 267, tbls.25-26, cht.40. The *Fourteenth Report*’s spectrum discussion also downplayed the relationship between Sprint Nextel and Clearwire, stating only that Clearwire “is affiliated with Sprint Nextel.” *Id.* at 11568 ¶ 266.

<sup>529</sup> See Verizon Wireless 2010 Competition Comments at 157-59.

Sprint Nextel and Clearwire combined hold 47 percent of the MHz-POPs of the above-1 GHz spectrum bands (PCS, AWS, BRS, and EBS). Sprint Nextel holds a 54 percent interest in Clearwire and has the ability to nominate seven of Clearwire's thirteen directors. Throughout this *Report*, we attribute Clearwire to Sprint Nextel when discussing spectrum holdings and network coverage.<sup>530</sup>

To the extent that this language reflected the Commission's intention, Verizon Wireless supports its view. However, Verizon Wireless notes that the *Fifteenth Report's* Chart 38, entitled "Mobile Wireless Provider Spectrum Holdings by Band, Weighted by Population," continues to identify Sprint Nextel separately from Clearwire, and to treat their spectrum as though it were held by separate entities.<sup>531</sup> Tables 27 and 28 likewise separate out the two companies.<sup>532</sup> The *Sixteenth Report* should remedy this error.

**C. The *Fifteenth Report* Continues to Place Undue Emphasis on Market Structure at the Expense of Market Behavior**

Verizon Wireless had criticized the *Fourteenth Report* for appearing to place undue emphasis on market-share metrics and consolidation, and it credits the Commission for responding to these points in the *Fifteenth Report*. Nevertheless, the *Fifteenth Report* included various analyses of concentration marred by some recurrent errors.

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<sup>530</sup> *Fifteenth Report*, 26 FCC Rcd at 9682 n.19. See also *id.* at 9694 ¶ 27 n.53 ("Throughout this *Report*, we attribute Clearwire to Sprint Nextel when discussing spectrum holdings and network coverage. When analyzing concentration and performance metrics, the two firms are treated as separate entities because the NRUF data used for the concentration analysis do not include Clearwire, and Sprint Nextel does not consolidate Clearwire in its SEC filings and financial/operational data.").

<sup>531</sup> *Id.* at 9832 cht.38.

<sup>532</sup> *Id.* at 9831 tbls.27-28.

## 1. The *Fifteenth Report* Continues to Focus Too Heavily on HHI Measures to Assess Competitive Trends

At certain points the *Fifteenth Report* recognizes that the mobile wireless market, due to economies of scale, is likely to be more concentrated than markets outside the high-technology field, but the *Report* still overemphasizes the impact of HHI measures on competition.<sup>533</sup>

It is well established within academia and antitrust enforcement literature that market shares alone simply do not paint a comprehensive portrait of competition within an industry. As Areeda and Hovenkamp observe in the leading antitrust treatise, even a high market share will not necessarily denote market power.<sup>534</sup> Katz and Shelanski similarly have noted that “current product-market shares may indicate very little about the future of the industry or about whether any given firm will possess significant market power.”<sup>535</sup> The Federal Trade Commission (“FTC”) and the Department of Justice (“DOJ”), the two agencies charged with implementing and enforcing the nation’s antitrust laws, likewise have reiterated the need to look beyond concentration. The revised Horizontal Merger Guidelines issued by these two entities state that “[m]arket shares may not fully reflect the competitive significance of firms in the market” and thus, must only be consulted in conjunction with other evidence of the state of competition.<sup>536</sup>

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<sup>533</sup> See *Fifteenth Report*, 26 FCC Rcd at 9707-13 ¶¶ 48-54, 9715 ¶ 61 n.151; Verizon Wireless 2010 Competition Comments at 125.

<sup>534</sup> See PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION* § 506d (Aspen Publishers 2007) (“*Antitrust Law*”) (“Substantial market power can persist only when there are significant and continuing barriers to expansion and entry.”); see also *id.* § 506a (“[T]he degree of market power depends on the response of buyers to price changes. Greater responsiveness (greater ‘elasticity’ of demand) minimizes market power.”).

<sup>535</sup> Michael L. Katz & Howard A. Shelanski, ‘Schumpeterian’ Competition and Antitrust Policy in High-Tech Markets, 14 *COMPETITION* 47, \*10 (2005).

<sup>536</sup> U.S. DEPARTMENT OF JUSTICE AND FEDERAL TRADE COMMISSION, *HORIZONTAL MERGER GUIDELINES* § 5.3 (issued Aug. 19, 2010), <http://www.justice.gov/atr/public/guidelines/hmg-2010.html> (“HORIZONTAL MERGER GUIDELINES”).

This is not news to the Commission. Indeed, before the *Fourteenth Report*, the Commission routinely rejected excessive focus on market share. In determining whether a transaction is in the public interest, the Commission would instead apply a “multi-factor, market-specific analysis” drawing “conclusions based on the totality of the circumstances present in a given market....”<sup>537</sup> As economist Michael Topper explained in response to the 2009 *Competition NOI*: “market structure indicators such as the number of competitors, market shares, or concentration ratios should only be a first step in a competition inquiry. The next step is to understand the conduct of providers and consumers in the market.”<sup>538</sup> In fact, “[e]ven in highly concentrated markets, producer rivalry can lead to competitive outcomes....”<sup>539</sup> The *Fifteenth Report* at times seems to recognize as much, stating that “an analysis of other factors,

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<sup>537</sup> *Verizon Wireless-Alltel Order*, 23 FCC Rcd at 17489 ¶ 94; see also *Verizon Wireless-Rural Order*, 23 FCC Rcd at 12497 ¶ 70 (noting that Commission’s merger review involves consideration of numerous variables and analyses deemed important for “predicting the incentive and ability of service providers to successfully restrict competition on price or non-price terms through coordinated interaction, and the incentive and ability of the merged entity unilaterally to elevate prices or suppress output.”) (citation omitted); *AT&T-Cingular Order*, 19 FCC Rcd at 21557 ¶ 69 (“HHI data provide only the beginning of the analysis. The Commission then examines other market factors that pertain to competitive effects, including the incentive and ability of other firms to react and of new firms to enter the market. Ultimately, the Commission must assess whether it is likely that the merged firm could exercise market power in any particular market”); NYNEX Corp. and Bell Atlantic Corp., *Memorandum Opinion and Order*, 12 FCC Rcd 19985, 19987 ¶ 2 (1997) (“Our examination of a proposed merger under the public interest standard ... extends beyond the traditional parameters of review under the antitrust laws.”).

<sup>538</sup> DECLARATION OF MICHAEL D. TOPPER, ASSESSING THE COMPETITIVENESS OF MOBILE WIRELESS: AN ECONOMIC ANALYSIS 16 (Sep. 30, 2009) (“TOPPER”), attached as Exhibit A to Comments of Verizon Wireless, WT Docket No. 09-66 (filed Sep. 30, 2009) (responding to Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless including Commercial Mobile Services, *Notice of Inquiry*, 24 FCC Rcd 11357 ¶ 28 (2009) (“2009 *Competition NOI*”)); see also GREGORY L. ROSSTON & MICHAEL D. TOPPER, AN ANTITRUST ANALYSIS OF THE CASE FOR WIRELESS NETWORK NEUTRALITY 21 (Aug. 2009), <http://siepr.stanford.edu/publicationsprofile/1989> (“While structural measures such as HHIs provide a starting place, industry structure is just a first step in an antitrust analysis assessing the competitiveness of the wireless market. The next step is to assess the actual performance of the industry, as measured by prices and quantities consumed.”) (“ROSSTON-TOPPER”).

<sup>539</sup> TOPPER at 7.

such as entry conditions and the degree of price and non-price rivalry, may nonetheless find that a market with high concentration levels is competitive.”<sup>540</sup>

A narrow focus on concentration and HHIs is even more misguided when applied to a market with substantial fixed costs, like wireless, where it is simply not efficient or commercially viable for large numbers of companies to operate in the same area. Topper explains the relationship between economies of scale in network industries and efficient industry structure:

It is well recognized in economics that the number of competitors that can efficiently serve a market depends on the size of the market relative to the minimum efficient scale (MES) of production and distribution. In industries like wireless with substantial fixed costs, it will be inefficient and not commercially viable for a very large number of firms to operate in the same geographic area.<sup>541</sup>

For this very reason, the DOJ’s Antitrust Division last year cautioned the Commission not to expect the broadband market to resemble the perfectly competitive markets found in economics textbooks.<sup>542</sup> The *Fifteenth Report* also recognizes this, stating that “economy[s] of scale are important in the mobile wireless industry,” and that “[a] high level of network

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<sup>540</sup> *Fifteenth Report*, 26 FCC Rcd at 9702 ¶ 40; *see also id.* 9713 ¶ 54 (internal citation omitted) (“Shares of subscribers and measures of concentration are not synonymous with a non-competitive market or with market power – the ability to charge prices above the competitive level for a sustained period of time. High market concentration may indicate that a firm or firms potentially may be able to exercise market power, but market concentration measures alone are insufficient to draw such a conclusion.”).

<sup>541</sup> TOPPER at 10 (internal citation omitted); *see also* MICHAEL L. KATZ, MEASURING EFFECTIVE CMRS COMPETITION ¶ 11 (July 13, 2009) (“KATZ”), attached as Exhibit A to Reply Comments of AT&T, WT Docket No. 09-66 (filed July 13, 2009) (“In the presence of economies of scale and density, it is economically inefficient and unlikely to be commercially viable to have a large number of suppliers, each operating at a small scale or low density. In such markets, it is a mistake to seek or expect to have a large number of suppliers and/or to have suppliers set prices equal to marginal costs (as would perfect competitors).”).

<sup>542</sup> *See Ex Parte* Submission of the United States Department of Justice, GN Docket No. 09-51, at 11 (filed Jan. 4, 2010) (“U.S. DOJ *Ex Parte*”). The revised Horizontal Merger Guidelines issued in August 2010 state that “a primary benefit of mergers to the economy is their potential to generate significant efficiencies and thus enhance the merged firm’s ability and incentive to compete, which may result in lower prices, improved quality, enhanced services, or new products.” HORIZONTAL MERGER GUIDELINES, § 10.

deployment costs (a type of fixed cost of building network capacity) in relation to the number of customers may limit the number of firms that can enter and survive in a market.”<sup>543</sup>

Despite these limitations, the *Fifteenth Report* emphasizes HHI figures and purported concentration, addressing these factors over a span of fourteen paragraphs including five tables, three charts, and one map.<sup>544</sup> The *Fifteenth Report* notes a drop in HHI figures over the course of 2009, but also underscores a 1 percent increase in HHI during the beginning of 2010.<sup>545</sup> Moreover, Chart 1 emphasizes the fact that recent HHI values have been above the “highly concentrated” threshold without acknowledging that threshold’s limited utility in the context of telecommunications markets.<sup>546</sup>

Odder still is the *Fifteenth Report*’s failure to evaluate whether concentration has in fact given rise to pro-competitive and pro-consumer efficiencies. As the former economics director for the FCC’s Broadband Task Force concluded with regard to the *Fourteenth Report*: “even if we accept the premise that the market for wireless providers has become more concentrated, we nevertheless see an incredibly dynamic market that is yielding new devices, new services, and lower prices.”<sup>547</sup> Yet the *Fifteenth Report* neglects to consider the *effects* of concentration.

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<sup>543</sup> *Fifteenth Report*, 26 FCC Rcd at 9715 ¶ 61 (internal citation omitted).

<sup>544</sup> *Id.* at 9708-13 ¶¶ 50-55.

<sup>545</sup> *Id.* at 9709 ¶¶ 51-52.

<sup>546</sup> *Id.* at 9711, cht.1.

<sup>547</sup> Scott Wallsten, *The FCC’s New Wireless Competition Report: The Right Way to Look at the Industry*, TECHNOLOGY POLICY INSTITUTE BLOG, May 22, 2010, <http://www.techpolicyinstitute.org/blog/2010/05/the-fcc%e2%80%99s-new-wireless-competition-report-the-right-way-to-look-at-the-industry>.

## 2. The Exclusion of MVNOs as Distinct Market Participants Skews the *Fifteenth Report's* Evaluation of Concentration

The *Fifteenth Report's* concentration analysis is also flawed by its presumption that MVNOs exert no independent competitive pressure – it simply decides, without any empirical support, to “attribute[] the subscribers of MVNOs to their hosting facilities-based providers when it calculates market concentration metrics.”<sup>548</sup> Yet, the competitive impact to MVNOs cannot be so easily dismissed.

As the *Fifteenth Report* acknowledges, at the end of 2009, MVNO provider TracFone Wireless had over 14 million subscribers, making it the *fifth largest* mobile wireless service provider after the four nationwide facilities-based providers.<sup>549</sup> Further, the *Fifteenth Report* again recognized that “TracFone is generally regarded as the leader in the low-end prepaid niche.”<sup>550</sup> Such an unaffiliated entity must be considered relevant in a competitive analysis. TracFone competes robustly to win customers away from facilities-based providers, including Verizon Wireless and AT&T, and succeeds in doing so; TracFone has increased its wireless subscribers to 19.3 million, a 15.7 percent increase since September 2010.<sup>551</sup>

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<sup>548</sup> *Fifteenth Report*, 26 FCC Rcd at 9700 ¶ 36. The *Fifteenth Report* includes a single cited source for the proposition that MVNOs may not exert substantial competitive pressure. See *id.* at 9701 ¶ 36 n.91, citing P. Kalmus and L. Wiethaus, *On the Competitive Effects of Mobile Virtual Network Operators*, TELECOMMUNICATIONS POLICY, Vol. 34, 2010. That source does not even purport to undertake any empirical analysis of how providers behave in the market. Rather, in seven pages of text, the authors construct a “simple analytical framework” to model how providers *might* behave in the market, and conclude that facilities-based providers will not sell capacity to MVNOs that might compete against them in the retail market. The data tell a very different story, in which an MVNO can become the fifth-largest retail provider in the nation and exert real pricing pressure on facilities-based carriers.

<sup>549</sup> See *id.* at 9699 ¶ 34.

<sup>550</sup> *Id.* at 9730 ¶ 96 (citation omitted).

<sup>551</sup> See AMÉRICA MÓVIL, THIRD QUARTER OF 2011 FINANCIAL AND OPERATING REPORT 15 (Oct. 27, 2011), <http://www.americamovil.com/amx/en/cm/investor/repQ.html?p=29&s=40>.

TracFone is not alone. As explained in depth above, MVNOs compete along a host of vectors, differentiating themselves by assembling unique modules of content, applications, and devices that may not be available from their underlying carriage providers. MVNOs also target specific populations, offering specialized services, customer-care options, and service plans tailored to their business plans. As the *Fifteenth Report* recognizes, “MVNOs often increase the range of services offered by the host facilities-based provider by targeting certain market segments, including segments previously not served by the hosting facilities-based provider.”<sup>552</sup>

There is simply no basis for categorically dismissing the competitive threat posed by a market participant simply because it relies on a retail competitor for one wholesale input.<sup>553</sup> Such an analysis should instead focus on “the extent to which customers view various services as substitutes.”<sup>554</sup> Customers, of course, generally do not care – and often do not know – whether a service involves resold offerings available at retail from another provider, focusing instead on price, quality, and the family of devices, services, applications, and capabilities offered by the brand.

Even more puzzling is the fact that the *Fifteenth Report*’s approach to MVNOs stands in stark contrast to the central role that the Commission has previously afforded to resale in its competition policy framework. The Commission has consistently acknowledged the significant role of resellers in competitive markets:

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<sup>552</sup> *Fifteenth Report*, 26 FCC Rcd at 9699 ¶ 33.

<sup>553</sup> See, e.g., *FTC v. Cardinal Health Inc.*, 12 F. Supp. 2d 34 (D.D.C. 1998) (observing that all forms of distribution must, at some level, compete with each other and thus undertaking a careful evaluation of whether manufacturers, wholesalers, and retailers were in the same market for antitrust purposes based on whether customers can substitute among them easily).

<sup>554</sup> U.S. DOJ *Ex Parte* at 12.

Resellers benefit the marketplace by focusing on residential and smaller business customers, giving them pricing and volume discounts and customer service that facilities-based carriers often make available only to larger customers. Resellers also exert downward pressure on the rates charged by facilities based providers of CMRS through their ability to purchase wireless service at high-volume rates and pass those savings on to residential and small business customers. Low-volume consumers benefit from the reseller's lower rates. They also benefit from the reseller's ability to impose market discipline on the facilities-based provider, which can result in lower prices overall.<sup>555</sup>

Market experience shows that MVNOs do, in fact, compete against facilities-based carriers, and that facilities-based providers affirmatively wish to sell them carriage. Indeed, since 2003, the year after the mandatory resale requirements sunset, MVNOs have increased subscribership by more than two and a half times.<sup>556</sup>

Thus, the *Fifteenth Report's* refusal to recognize the competitive force exerted by resellers and MVNOs, and its continuing attribution of MVNO customers – nearly 10 percent of wireless subscribers – to the underlying network provider, distort its evaluation of market concentration.

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<sup>555</sup> Personal Communications Industry Association's Broadband Personal Communications Services Alliance's Petition for Forbearance For Broadband Personal Communications Services, *Memorandum Opinion and Order and Notice of Proposed Rulemaking*, 13 FCC Rcd 16857, 16874-75 ¶ 35 (1998) (internal citations omitted).

<sup>556</sup> *Compare* Industry Analysis and Technology Division, Wireline Competition Bureau, FCC, Local Telephone Competition: Status as of December 31, 2003, tbl.13 (June 2004) (noting that as of December 2003, MVNO Resale Subscribers totaled about 9.4 million (6 percent of 157,042,082 total subscribers)) *with* Dec. 2010 Local Telephone Competition Data, tbl.17 (noting that as of December 2010, MVNO resale subscribers totaled about nearly 26 million (9 percent of 285,125,000 total subscribers)).

### 3. An Evaluation of the Effects of Consolidation Reveals Significant Consumer Welfare Benefits

Moreover, any analysis of consolidation must account for the benefits that such consolidation can bring. The *Fifteenth Report* observes that many recent wireless mergers have not had an anticompetitive effect:

“In many instances, the entities that were combined had not previously competed in the same geographic market. As a result, these transactions resulted in the expansion of the coverage of the newly combined entity. In markets where the entities were significant competitors, the Commission may have required divestitures in specified markets as conditions of the transaction in order to prevent competitive harm.”<sup>557</sup>

As explained more above, the current market structure reflects a deliberate shift away from the cost-duplication that attended the previously fractured wireless marketplace, and toward a regime in which wireless providers can achieve scale and thereby increase customer welfare. As the market evolved, prices have continued to fall and usage continued to climb. All of this occurred at a time when providers continued to cover more and more of the population.<sup>558</sup> These clearly pro-consumer trends have occurred while and after the FCC approved a number of major wireless transactions.

Verizon Wireless firmly believes an empirical review demonstrates the benefits of consolidations the Commission has approved. For example, in 2008, the Commission granted Verizon Wireless authority to acquire ALLTEL and Rural Cellular Corp. (“RCC”)<sup>559</sup> – two wireless providers primarily serving geographic areas not previously served by Verizon

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<sup>557</sup> *Fifteenth Report*, 26 FCC Rcd at 9722 ¶ 75.

<sup>558</sup> See generally FCC CMRS Competition Reports 2000-2008.

<sup>559</sup> See generally *Verizon Wireless-Alltel Order*; *Verizon Wireless-Rural Order*.

Wireless. This transaction has resulted in significant benefits for former ALLTEL and RCC subscribers, and broader market-wide benefits as well, including:

- A comprehensive upgrade of ALLTEL and RCC properties to EvDO Rev. A;
- Customers in the acquired ALLTEL and RCC markets will receive Verizon Wireless’s premier 4G LTE service;
- Dramatically lower roaming and long distance prices for former RCC and ALLTEL customers; and
- Far greater access to devices, applications, and content.

These benefits are consistent with the Commission’s conclusion that the sales of ALLTEL and RCC to Verizon Wireless were in the public interest. More broadly, they demonstrate the validity of the findings it made in those and in other merger proceedings – that consolidation can bring benefits to consumers.

**D. The *Fifteenth Report* Too Often Fails to Acknowledge that Today’s Market is Advancing Consumer Welfare**

**1. The *Fifteenth Report* Does Not Acknowledge Consumer Satisfaction as a Basis for Low Churn**

Like the *Fourteenth Report*, the *Fifteenth Report* cites churn levels as “[a] reasonable proxy to determine whether switching costs are high enough to prevent consumers from making changes” in their service plans.<sup>560</sup> The clear implication is that lower churn rates are an indication that switching costs are too high to allow customers to change providers. As the *Report* notes fleetingly, however, low churn may instead reflect high levels of consumer satisfaction: “By examining the magnitude and trend over time of service provider churn, we

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<sup>560</sup> *Fifteenth Report*, 26 FCC Rcd at 9817 ¶ 260. As the *Fifteenth Report* explains, “[c]hurn refers to the percentage of current customers an operator loses over a given period of time, *i.e.*, a company’s gross loss of customers during that time period.” *Id.* (citation omitted).

can quantify the degree to which consumers have both *the desire* and the ability to change service providers to better meet their mobile wireless service needs.”<sup>561</sup> This reference is never elaborated upon or discussed.

Because satisfaction affects customer churn, and surveys are showing increasing customer satisfaction, it is not surprising that churn may decline over time. As discussed by economists Gregory Rosston and Michael Topper, carrier network investments, improved customer care and incentives, as well increasing customer experience over time with wireless network services, have limited churn rates and reflect an increase in the quality of the customer experience.<sup>562</sup> Therefore, any utilization of low churn data must take into account the role that increased consumer satisfaction plays in reducing churn rates.<sup>563</sup> Indeed, other evidence in the *Fifteenth Report* suggests that low churn rates do, in fact, reflect high consumer satisfaction. For example, Table 25 shows that, as of the end of 2009, the average Verizon Wireless customer remained a customer for 71 months – nearly six years.<sup>564</sup> The average subscriber lifetime for the four nationwide carriers has ranged recently between 52 and 55 months.<sup>565</sup> These periods are far longer than traditional postpaid contract lengths, which generally last at most two years. Thus, low churn levels are unlikely to reflect barriers to customer switching. Rather, the more logical conclusion is that the decline in customer churn is due to carriers’ increasing emphasis on customer service as well as the quality of carriers’ business models.

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<sup>561</sup> *Id.* (emphasis added) (citation omitted).

<sup>562</sup> *See* ROSSTON-TOPPER at 24.

<sup>563</sup> *See, e.g.*, General Motors Corp. and Hughes Electronics Corp., Transferors and the News Corp., Transferee, for Authority to Transfer Control, *Memorandum Opinion and Order*, 19 FCC Rcd 473, 613 ¶ 325 (2003) (recognizing that “reduced churn” can be an indication of “increased consumer satisfaction”).

<sup>564</sup> *Fifteenth Report*, 26 FCC Rcd at 9820, tbl.25.

<sup>565</sup> *Id.*

## 2. The *Fifteenth Report* Avoids Discussion of Falling Postpaid Service Prices

The record compiled in the lead-up to the *Fifteenth Report* included extensive data regarding declining prices for postpaid wireless service. For example, Verizon Wireless provided 11 data points regarding new postpaid plans offering reduced rates.<sup>566</sup> Other providers offered similar information regarding falling prices.<sup>567</sup>

Notwithstanding the record evidence, the *Fifteenth Report*'s section on pricing trends *does not discuss these postpaid price reductions at all*. In the *Fifteenth Report*'s words: “[W]hereas the *Fourteenth Report* included an extensive discussion of recent pricing changes and new features and options with respect to postpaid voice plans, the *Report* focuses on the industry’s shift from unlimited data pricing to tiered, usage-based data pricing for smartphones.”<sup>568</sup> If the *Report* is to reflect a true portrait of the mobile ecosystem, however, it must address falling prices. Although many other factors are also important – including investment, innovation, and devices, for example – pricing trends also play a critical role in evaluating a market’s competitiveness.<sup>569</sup> The Commission should not have omitted this analysis from the *Fifteenth Report*, and it should not omit discussion of the falling prices addressed above<sup>570</sup> in the *Sixteenth Report*.

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<sup>566</sup> See Verizon Wireless 2010 Competition Comments at 54-56.

<sup>567</sup> See Comments of AT&T Inc., WT Docket No. 10-133, at 44 (filed July 30, 2010).

<sup>568</sup> *Fifteenth Report*, 26 FCC Rcd at 9725 ¶ 84 (internal citation omitted).

<sup>569</sup> As noted above, the *Fifteenth Report* elsewhere recognized that “an analysis of other factors, such as entry conditions and the degree of price and non-price rivalry, may ... find that [even] a market with high concentration levels is competitive.”). *Fifteenth Report*, 26 FCC Rcd at 9702 ¶ 40.

<sup>570</sup> See *supra* Section II.A.1.

**E. The *Fifteenth Report* Again Errs in Using Investment and Profitability as Indices of Competition**

**1. The *Fifteenth Report* Overstates the Relevance of the Capex/Revenue and Investment/Subscriber Ratios, and Fails to Account for Broader Economic Conditions**

Like the *Fourteenth Report* before it, the *Fifteenth Report* places too much emphasis on flawed metrics in assessing carrier investment. In comments prepared for the *Fourteenth Report*, Verizon Wireless and other entities provided significant analysis explaining why data concerning capital expenditures (“capex”) relative to revenue is not a useful metric in evaluating a market’s competitiveness.<sup>571</sup> The record compiled for the *Fifteenth Report* included similar discussion.<sup>572</sup> Yet the *Fifteenth Report* again places emphasis on the “capex-to-revenue ratio,” which either held steady or fell by one percent in 2009, depending on the source consulted.<sup>573</sup> The *Fifteenth Report* likewise notes that U.S. Census Bureau data show total wireless industry capex declining in 2009 vis-à-vis 2008 – and while it mentions that CTIA data shows total incremental capex rising in 2009, it instead focuses on falling *per-subscriber* investment.<sup>574</sup>

This approach to investment data is flawed in several respects. First, as Verizon Wireless and others have explained before, use of capex-to-revenues figures as a gauge of competition is inappropriate. Capital investment levels are strongly affected by factors completely unrelated to a company’s revenues in the same year, and more closely linked to technological cycles, the cost

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<sup>571</sup> See, e.g., Reply Comments of Verizon Wireless, WT Docket No. 09-66, at 23-24 (filed Oct. 22, 2009); Reply Comments of AT&T Inc., WT Docket No. 09-66, at 21-23 (filed Oct. 22, 2009).

<sup>572</sup> See Verizon Wireless 2010 Competition Comments at 164-65.

<sup>573</sup> See *Fifteenth Report*, 26 FCC Rcd at 9794 ¶ 210, ch.29 (reporting that capex-to-revenues held steady at 14 percent according to Census Bureau data, and fell from 14 percent to 13 percent according to CTIA data).

<sup>574</sup> See *id.* at 9792 ¶¶ 208-209.

of capital, and other factors.<sup>575</sup> For example, capital-intensive firms are likely to undertake substantial capital investments early on, and to follow that initial period with a period of declining capex-to-revenues ratios, in part because over the life cycle of a technology, capital costs reduce due to scale, until technological developments and changing business conditions warrant a new round of heavy investment (again, as a percentage of revenue).

This cycle is particularly relevant to the wireless industry, where providers begin operations with very high capex and very low revenues. Indeed, the capex-to-revenue ratio is likely to oscillate precisely *because of* the relationship between today's investment and tomorrow's revenues. Investment often will not give rise to additional revenues for years to come, and there is no reason to believe that investment will keep in lockstep pace with revenues, or vice versa.<sup>576</sup> In fact, as Verizon Wireless has pointed out before, and as the *Fifteenth Report* recognizes, "CAPEX by mobile service providers can be 'lumpy,' meaning that it can vary significantly from one year to the next for a specific provider."<sup>577</sup> Moreover, successful investment might have the effect of *decreasing* the capex-to-revenues ratio (by increasing the denominator in the equation in the years following an investment), and *failed* investment might have the effect of *increasing* the ratio (by decreasing the denominator). Thus, a framework that affords significant weight to the capex-to-revenues ratio perversely punishes success and rewards failure.

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<sup>575</sup> See, e.g., WILLIAM L. MEGGINSON & SCOTT B. SMART, INTRODUCTION TO CORPORATE FINANCE 670-74 (2004) (discussing financial factors influencing long-term investment decisions); Duke K. Bristow, Benjamin D. King & Lee R. Petillon, *Venture Capital Formation and Access: Lingering Impediments of the Investment Company Act of 1940*, 2004 COLUM. BUS. L. REV. 77, 80 n.4 (2004) ("Investment of risk capital is cyclical in nature...").

<sup>576</sup> "[C]apital goods do not begin to yield benefits until they are actually being used. Often the decision to build a building or purchase a piece of equipment must be made years before the actual project is completed." KARL E. CASE & RAY C. FAIR, PRINCIPLES OF ECONOMICS 262 (1989).

<sup>577</sup> *Fifteenth Report*, 26 FCC Rcd at 9791-92 ¶ 207.

Second, an analysis of capex alone does not take into consideration the expense of acquiring spectrum. In the past five years alone, wireless carriers have invested more than \$32.5 billion in acquiring new spectrum in Auction 66 (AWS-1) and Auction 73 (700 MHz Band).<sup>578</sup> Thus, an increase in spectrum-related spending relative to capital expenditures might appear to reflect a decrease in the capex-to-revenue ratio, even though spectrum investments could be at very high levels and could more effectively serve consumer needs in a given period than spending that would fall into the “capex” category.<sup>579</sup>

Third, the *Fifteenth Report*'s focus on “per subscriber” investment fails to account for the economics of networked industries, which involve high fixed capital costs and low incremental costs. In such industries, “investment per subscriber” has little meaning, because investments in network plant and technology will often benefit *all* users. Indeed, reliance on “investment per subscriber” has the perverse effect of punishing carriers for attracting new customers. If wireless providers increased their investments in 2009, but also saw substantial growth in subscriptions, there is no reason to *criticize* them because the pace of investment did not keep up with the pace of customer additions in that particular year.

Finally, any focus on investment must account for the dismal economic climate during the period at issue – namely, 2009 and early 2010. During this period, the nation was in the midst of the most significant economic recession since the Great Depression. The fact that

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<sup>578</sup> See Auction of 700 MHz Band Licenses Closes; Winning Bidders Announced for Auction 73, *Public Notice*, 23 FCC Rcd 4572 (WTB 2008); Auction of Advanced Wireless Services Licenses Closes; Winning Bidders Announced for Auction 66, *Public Notice*, 21 FCC Rcd 10521 (WTB 2006).

<sup>579</sup> The Executive Summary of the *Fifteenth Report* neglects to point out that three of the four nationwide providers, including Verizon Wireless, invested *more* in 2009 than in the previous two years, notwithstanding the recent economic downturn. See *Fifteenth Report*, 26 FCC Rcd at 9680-81. Only Sprint Nextel showed a decline. *Id.* at 9794 ¶ 211.

investment remained strong (at \$20.4 billion according to CTIA and at \$20.7 billion according to the Census Bureau) during this difficult time is itself meaningful, and of greater importance than any specific fluctuations observed.

## 2. Accounting Profit Is Not a Reliable Indicator of Competition

The FCC also erred in again relying on “profitability” to assess the competitiveness of the wireless market. As in the previous year, the record included substantial evidence, as well as scholarly study backed up by experience, demonstrating that accounting profit is not a reliable indicator of the state of competition in a market.<sup>580</sup> The *Fifteenth Report* acknowledges that “accounting-based indicators of profitability are not estimates of economic profit, nor are they necessarily indicators of competition or market power.”<sup>581</sup> However, it then chooses to ignore these problems, on the basis that “limitations on data availability make it difficult to measure true economic profit,”<sup>582</sup> and spends the next six pages discussing accounting profit. In other words, the *Fifteenth Report* recognizes that accounting profit is irrelevant but addresses it anyway.

The record below made clear that the Commission was right to discount the value of accounting-profit data in its evaluation of competition. As former FCC Chief Economist Michael Katz stated, “[i]t is well-recognized among economists that accounting measures of profitability are ill-suited for gauging competitive intensity. There are several well-known ways in which accounting profits diverge from economic profits. This divergence is a serious issue

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<sup>580</sup> See, e.g., Verizon Wireless 2010 Competition Comments at 165-67; Comments of Verizon Wireless, WT Docket No. 09-66, 11 n.39 (filed June 15, 2009).

<sup>581</sup> *Fifteenth Report*, 26 FCC Rcd at 9795 ¶ 212.

<sup>582</sup> *Id.*

because economic profits are the measure relevant to the assessment of market performance.”<sup>583</sup> Moreover, as Katz explains, “[e]ven if it were possible to estimate economic profits accurately, the existence of positive economic profits does not indicate that competition is ineffective or that regulatory intervention is warranted.”<sup>584</sup>

Empirical research confirms that accounting profit is not a reliable indicator of market power.<sup>585</sup> Notably, attempts in the 1970s to base a competition enforcement program on the relationship between concentration and profitability were strikingly unsuccessful.<sup>586</sup> Accordingly, the *Fifteenth Report* erred by attempting to use accounting profit as an indicator of competition in the market for mobile wireless services. The *Sixteenth Report* should dispense with any discussion of this inherently flawed metric.

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<sup>583</sup> KATZ at ¶ 5 (emphasis omitted).

<sup>584</sup> See *id.* (“It is necessary to account for both the stochastic nature of competitive outcomes and the costs and limitation of governmental intervention. With respect to the stochastic nature of outcomes, high ex post levels of profit are consistent with low ex ante or expected levels of profit, which are what drive investment decisions.”) (emphasis omitted). Similarly, as Carl Shapiro (currently the Assistant Attorney General for Economics at the Department of Justice Antitrust Division) testified before the Antitrust Modernization Commission, “[I]t is an error to infer genuine antitrust market power based on the gap between price and marginal cost. This error may be more common or more pronounced in innovative industries .... The gap between price and marginal cost provides a necessary return to cover various fixed costs, including R&D costs in innovative industries and the ‘first-copy’ in content-based markets. The key point to bear in mind here is that the competitive price can easily and significantly exceed marginal cost.” Carl Shapiro, Antitrust, Innovation, and Intellectual Property, Testimony before the Antitrust Modernization Commission, at 7 (Nov. 8, 2005), <http://faculty.haas.berkeley.edu/shapiro/amcinnovation.pdf>.

<sup>585</sup> See William E. Kovacic, *Failed Expectations: The Troubled Past and Uncertain Future of the Sherman Act as a Tool for Deconcentration*, 74 IOWA L. REV. 1105, 1136-39 (1989) (discussing scholarship on issue); Almarin Phillips, *Market Concentration and Performance: A Survey of the Evidence*, 61 NOTRE DAME L.REV. 1099, 1102-03 (1986).

<sup>586</sup> Kovacic, *Failed Expectations*, 74 IOWA L. REV. at 1108 (“Never in antitrust history has so massive a litigation program yielded such disappointing results. Most of the government’s deconcentration cases either collapsed before trial or failed to establish liability.”).

## VI. CONCLUSION

A broad range of evidence reflects a market in which consumers pay less for more capability, while innovation fuels further innovation. As these comments demonstrate, competition between and among providers of wireless services, devices, operating systems, applications, and content is resulting in ever greater consumer value. Whether considered individually or together, the market segments under consideration here are “effectively competitive.” The *Sixteenth Report* should find as much.

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