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Federal Communications Commission
Washington, D.C. 20554

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In the Matter of
Implementation of Section 6002(b) of the
Omnibus Budget Reconciliation Act of 1993
Annual Report and Analysis of Competitive
Market Conditions With Respect to Mobile
Wireless, Including Commercial Mobile Services

WT Docket No. 10-133
(Terminated)

FIFTEENTH REPORT

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McDowell concurring and issuing a separate statement.

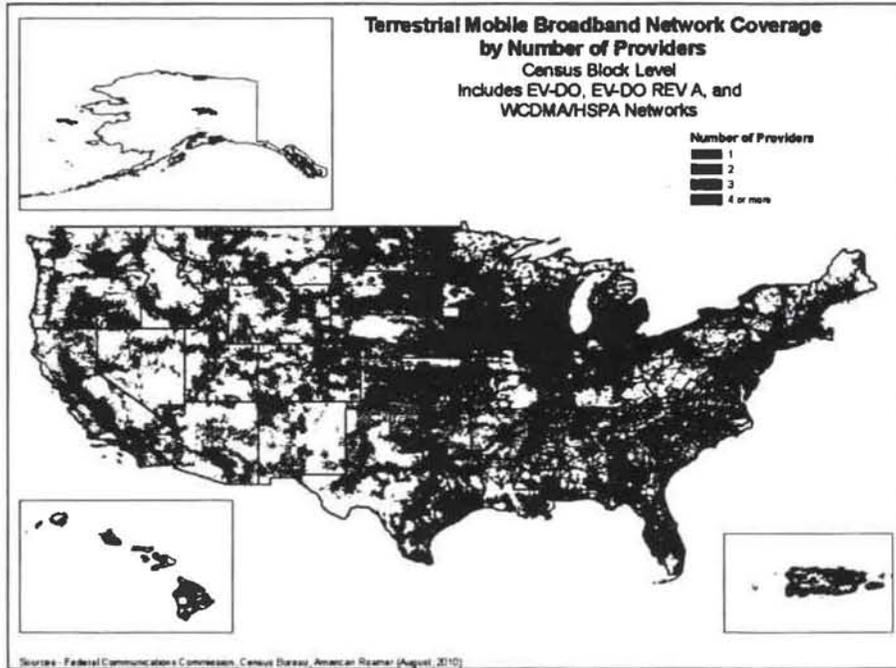
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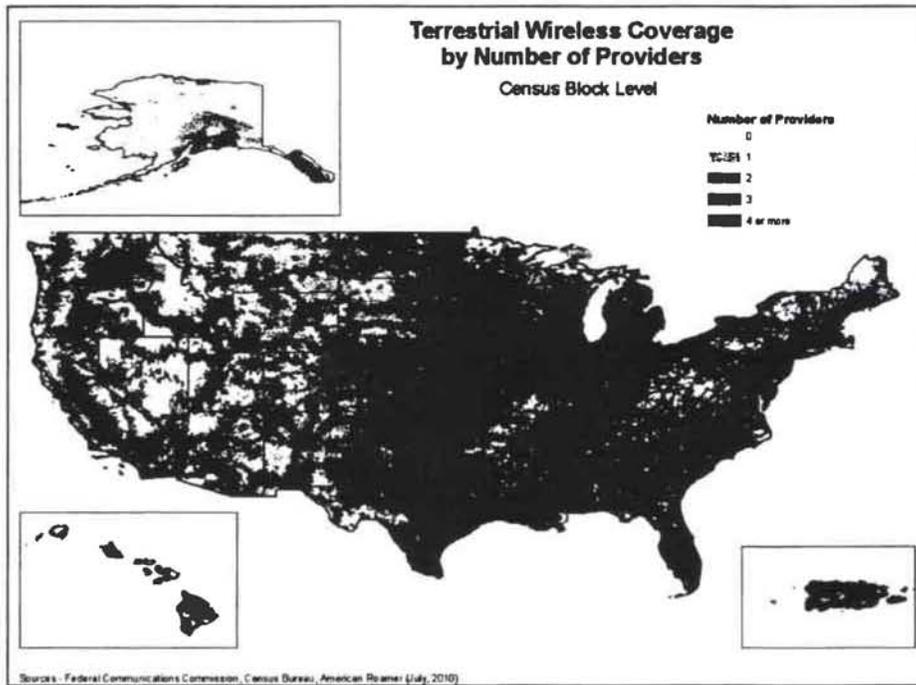
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Map 1: Mobile Wireless Broadband Coverage



Map 2: Mobile Wireless Network Coverage



## I. EXECUTIVE SUMMARY

1. Congress requires the Federal Communications Commission (Commission) to produce an annual report on the state of competition in the mobile services marketplace under section 332(c)(1)(C) of the Communications Act. In May 2010, the Commission released the *Fourteenth Report*, which provided an analysis of mobile wireless market conditions during 2008 and 2009.<sup>1</sup> This year's fifteenth Mobile Wireless Competition Report (*Fifteenth Report* or *Report*) updates the data and analysis presented in the *Fourteenth Report*, and analyzes mobile wireless service market conditions during 2009 and 2010,<sup>2</sup> including "competitive market conditions with respect to commercial mobile services" as required by the Act.<sup>3</sup> Like the *Fourteenth Report*, the *Fifteenth Report* presents a multitude of industry data on various aspects of mobile wireless competition.<sup>4</sup>

2. The *Fourteenth Report* examined, for the first time, competition across the entire mobile wireless ecosystem, including an analysis of the "upstream" and "downstream" market segments, such as spectrum, infrastructure, devices, and applications. Consistent with the Commission's first seven Annual Commercial Mobile Radio Service (CMRS) Competition Reports, the *Fourteenth Report* did not reach an overall conclusion regarding whether or not the CMRS marketplace was effectively competitive, but provided an analysis and description of the CMRS industry's competitive metrics and trends. The *Fifteenth Report* follows the same analytical framework used in the *Fourteenth Report*, with certain improvements based on responses to that *Report*. Thus, the *Fifteenth Report* makes no formal finding as to whether there is, or is not, effective competition in the industry. Rather, given the complexity of the various inter-related segments and services within the mobile wireless ecosystem, the *Report* focuses on presenting the best data available on competition throughout this sector of the economy and highlighting several key trends in the mobile wireless industry.

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<sup>1</sup> 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, *Fourteenth Report*, 25 FCC Rcd 11407 (2010) (*Fourteenth Report*).

<sup>2</sup> The *Report* includes network coverage data from American Roamer from the third quarter of 2010. In other instances, particularly where year-end metrics are discussed or annual comparisons are made, the *Report* uses year-end 2009 data. See Section II, Introduction, *infra*, for an additional discussion of data timeframes.

<sup>3</sup> 47 U.S.C. § 332(c)(1)(C). As discussed below, this analysis integrates an analysis of commercial mobile radio services (CMRS) into an analysis of all mobile wireless services, including voice, messaging, and broadband. See Section II, Introduction, *infra*.

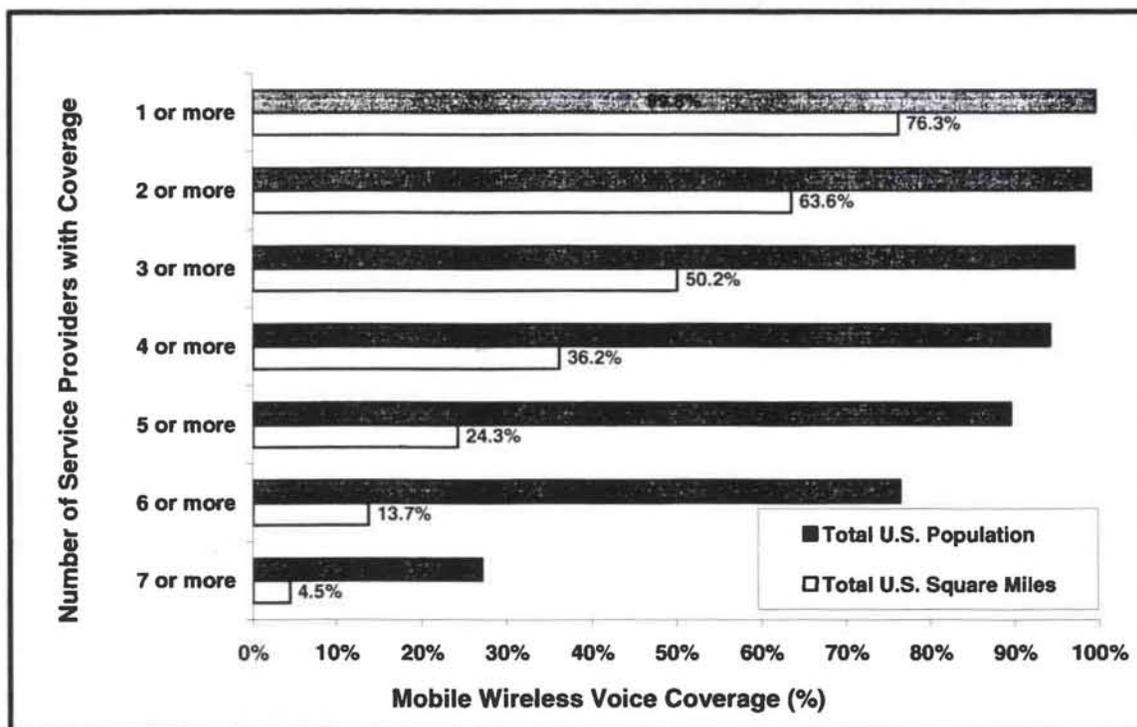
<sup>4</sup> 47 U.S.C. § 332(c)(1)(C). As with previous *Reports*, this *Report* does not address the merits of any license transfer applications that are currently pending before the Commission or that may be filed in the future, which will be decided based on the record collected in each proceeding. See, e.g., *Fourteenth Report*, 25 FCC Rcd at 11429 n. 14 ("an application for approval of a license transfer, may present facts pointing to narrower or broader markets than any used, suggested, or implied in this *Report*").

Selected developments and key metrics with respect to the current state of mobile wireless competition are highlighted below:

### Number of Providers & Network Deployment

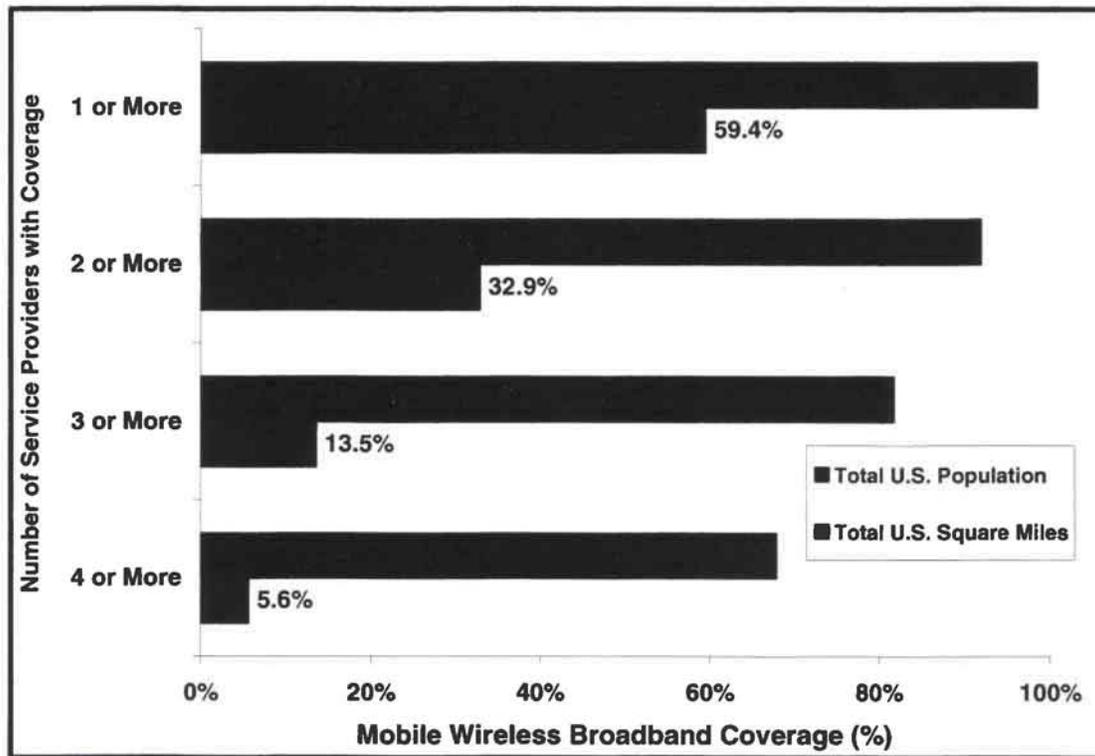
For the fourth consecutive *Report*, the Commission has conducted an analysis of service provider coverage by census block, based on data from American Roamer<sup>5</sup> and population data from the 2000 Census.<sup>6</sup> These data present the number of providers with network coverage in these census blocks, which may differ from the number of providers offering service to consumers living in these census blocks.

**Estimated Mobile Wireless Voice Coverage by Census Block, 2010**



<sup>5</sup> Our analysis of mobile wireless network coverage is based on coverage maps provided by American Roamer. We note that this analysis likely overstates the coverage actually experienced by consumers, because American Roamer reports advertised coverage as reported to it by many mobile wireless service providers, each of which uses a different definition or determination of coverage. Although the data are not consistent across geographic areas and service providers, the analysis is useful because it provides a general baseline that can be compared over time across network types, technologies, and providers. *Connecting America: The National Broadband Plan*, FCC, at 39 (Chapter 4) (rel. Mar. 16, 2010), available at [www.broadband.gov](http://www.broadband.gov) (*National Broadband Plan*). We also recognize that an analysis of coverage at the nationwide level provides only a general benchmark. A nationwide average will mask regional disparities in coverage and create an overall picture that does not capture variances across the country. See Section III.C.1, Number of Competitors, *infra*.

<sup>6</sup> Unless otherwise noted, population data in the *Report* are taken from U.S. Census Bureau (Census Bureau). For purposes of calculating numbers on broader geographic bases, such as the nationwide penetration rate, we use Census Bureau population estimates as of July 1, 2008. For purposes of calculating the extent of service provision based on census blocks, we use 2000 Census population figures because that is the Census Bureau's most recent data about population at the census block level.

Estimated Mobile Wireless Broadband Coverage by Census Block, 2010<sup>7</sup>

During 2009 and 2010, the four nationwide mobile wireless service providers (Verizon Wireless, AT&T, Sprint Nextel, and T-Mobile), as well as other mobile operators, continued to upgrade and expand their networks with advanced 3G and 4G technologies that allow for faster mobile broadband connection speeds.<sup>8</sup>

<sup>7</sup> Additional information on mobile broadband network availability can be found in the National Broadband Map, released by NTIA on February 17, 2011, available at <http://www.broadbandmap.gov/>.

<sup>8</sup> For purposes of this Report, the term “broadband” – when referring to mobile broadband networks, coverage, providers, or services – includes the 3G and 4G network technologies: HSPA, EV-DO, LTE, and mobile WiMAX. See Section IV.B.1, Network Coverage and Technology Upgrades, *infra*, for a further discussion.

**3G/4G Deployment by Selected Mobile Wireless Service Providers**

<b>Service Provider</b>	<b>HSPA and EV-DO Deployment</b>	<b>LTE and WiMAX Deployment</b>
Verizon Wireless	As of September 2010, EV-DO Rev. A network covered 289 million POPs.	In December 2010, launched LTE in 38 cities covering 110 million people. Plans to expand LTE to its entire EV-DO footprint (289 million people) by the end of 2013.
AT&T Wireless	As of early 2010, HSPA covered 230 million POPs. As of January 2011, entire HSPA network had been upgraded with HSPA+ (14.4 Mbps).	Plans to launch LTE in areas covering around 75 million people by mid-2011 and to complete its LTE buildout by year-end 2013.
Sprint Nextel	As of August 2010, EV-DO Rev. A network was available in census blocks covering 239 million POPs.	Resells Clearwire's WiMAX service.
Clearwire		As of year-end 2010, WiMAX network covered approximately 120 million people.
T-Mobile	HSPA network covered 212 million POPs as of mid-2010 and HSPA+ (21 Mbps) network covered 200 million POPs in 100 cities as of year-end 2010.	No U.S.-specific plans.
MetroPCS		As of January 2011, launched LTE in 13 cities.

**Subscribers, Connections, and Net Adds**

The data source that the Commission has used for many years to estimate the number of mobile wireless subscribers, Numbering Report/Utilization Forecast (NRUF), tracks the number of phone numbers that have been assigned to mobile wireless devices. When all mobile wireless devices were assigned telephone numbers and subscribers generally carried one mobile device for making voice calls, NRUF provided reasonably accurate measures of subscribership. However, consumers are now more likely to use more than one mobile device – particularly non-voice devices, such as Internet access devices (*e.g.*, wireless modem cards, netbooks, and mobile Wi-Fi hotspots), e-readers, tablets, and telematics systems – that commonly are assigned telephone numbers. In addition, certain mobile broadband providers do not assign telephone numbers to the devices on their networks. Therefore, NRUF is becoming increasingly less useful in measuring the number of individual subscribers but instead provides an estimate of the number of mobile wireless connections or connected devices.

Based on NRUF data, the number of mobile wireless connections grew four percent from 279.6 million at the end of 2008 to 290.7 million at the end of 2009. CTIA also estimates the total number of mobile subscriber connections based on its industry survey and found that the number of connections grew six percent from 270.3 million at the end of 2008 to 285.6 million at the end of 2009. Industry-wide net new mobile wireless subscriber/connection additions (or “net adds”) for 2009 totaled 11.1 million, based on NRUF data, and 15.3 million based on CTIA data.

The Commission is also able to estimate the number of mobile voice subscribers and mobile Internet access subscribers using data reported by service providers on Form 477. Based on those data, at the end of 2009 there were 274.3 million subscribers to mobile telephone, or voice, service, up nearly five percent from 261.3 million at the end of 2008. At the same time, there were 55.8 million subscribers to mobile Internet access services at speeds exceeding 200 kbps in at least one direction – which is more than double the number at the end of 2008.<sup>9</sup>

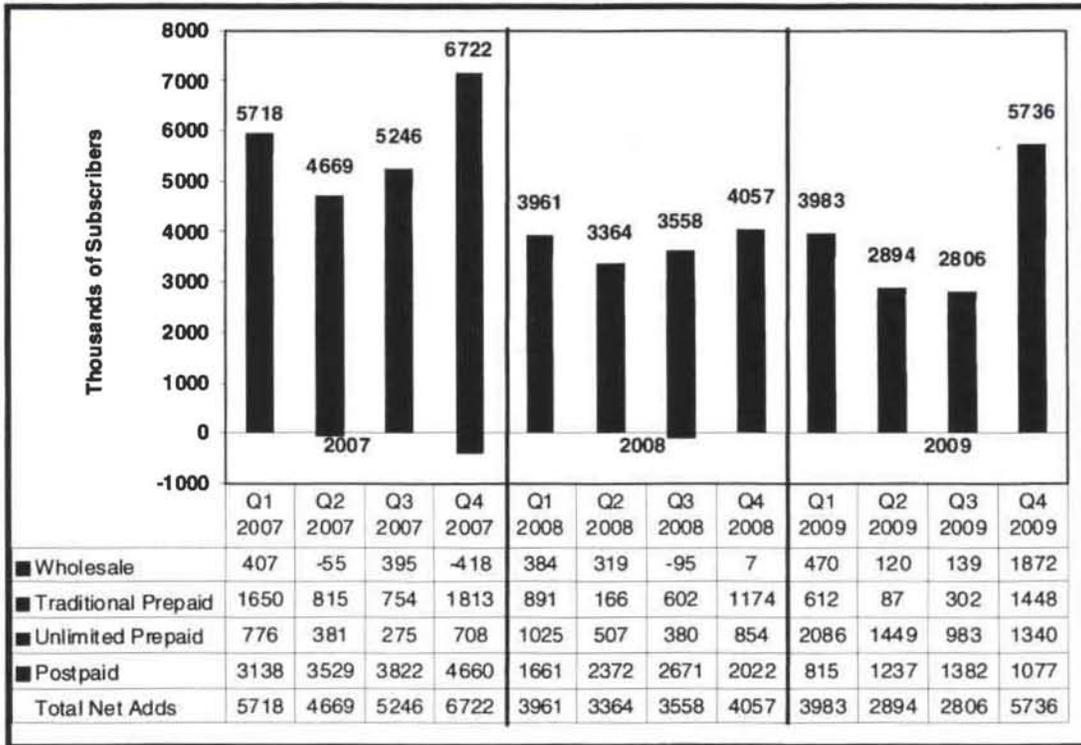
<sup>9</sup> This figure is based on the Commission's Form 477 data, which collects subscribership and other data from providers of Internet access services at speeds exceeding 200 kbps in at least one direction. See Section V.A, Subscribership/Connection Levels, *infra*, for a complete discussion. Only services provided using 3G or 4G mobile network technologies – including HSPA, EV-DO, LTE, and mobile WiMAX – would meet this speed threshold. In the Form 477 data, mobile telephone subscribers and mobile Internet access subscribers are not mutually exclusive.

Mobile Wireless Subscribers and Connections								
Year	Mobile Wireless Connections				Mobile Telephone Subscribers		Mobile Internet Access Subscribers	
	NRUF (millions)		CTIA (millions)		Form 477* (millions)		Form 477 (millions)	
	Total	Net Adds	Total	Net Adds	Total	Net Adds	Total	Net Adds
2001	128.5	n/a	128.4	18.9	124.0	23.0		
2002	141.8	13.3	140.9	12.4	138.9	14.9		
2003	160.6	18.8	158.7	18	157.0	18.1		
2004	184.7	24.1	182.1	23.4	181.1	24.1		
2005	213.0	28.3	207.9	25.8	203.7	22.6		
2006	241.8	28.8	233.0	25.1	229.6	25.9		
2007	263.0	21.2	255.4	22.4	249.3	19.7		
2008	279.6	16.6	270.3	14.9	261.3	12.0	26.5	
2009	290.7	11.1	285.6	15.3	274.3	13.0	55.8	29.3

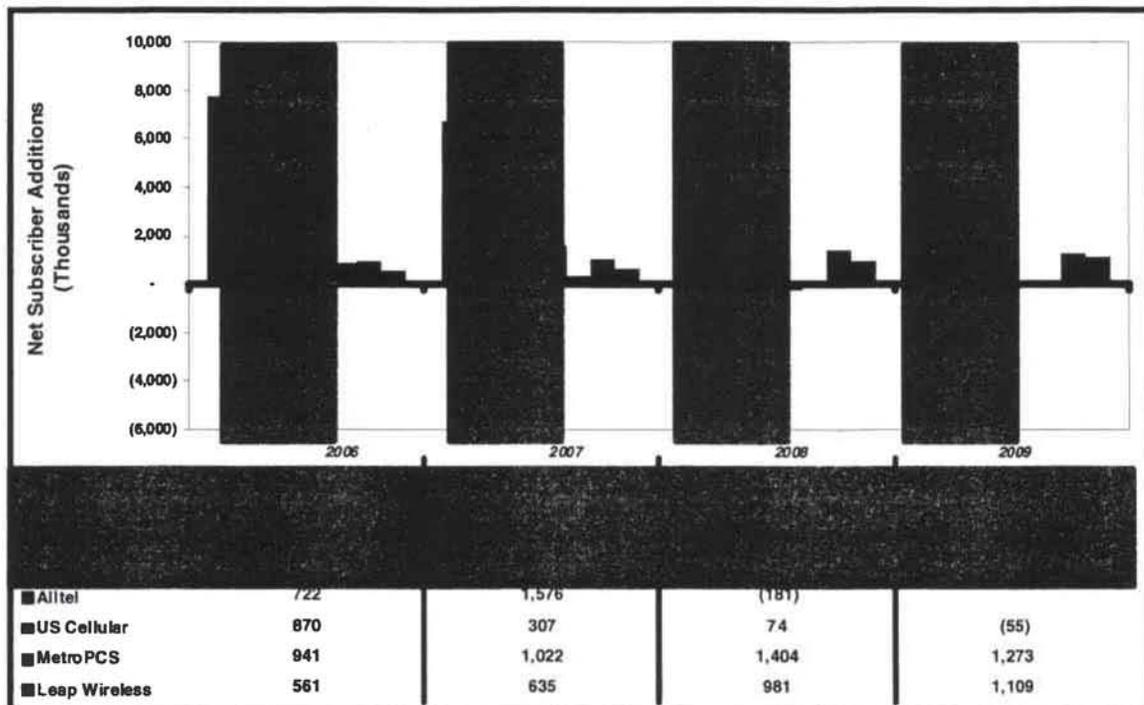
\* Prior to December 2004, only facilities-based wireless carriers with at least 10,000 mobile telephone subscribers per state were required to report data. Starting with the 2005 data, all facilities-based wireless carriers are required to report.

Quarterly net adds during 2009 varied by the type of pricing plan, with wholesale and prepaid subscribers accounting for a larger portion of total net adds than in 2008. In addition, as also shown below, net adds have not been distributed evenly among major mobile wireless service providers.

Quarterly Net Adds by Pricing Plan: 2007-2009<sup>10</sup>



<sup>10</sup> Wholesale net adds include subscriber connections served by resellers or MVNOs excluding TracFone.

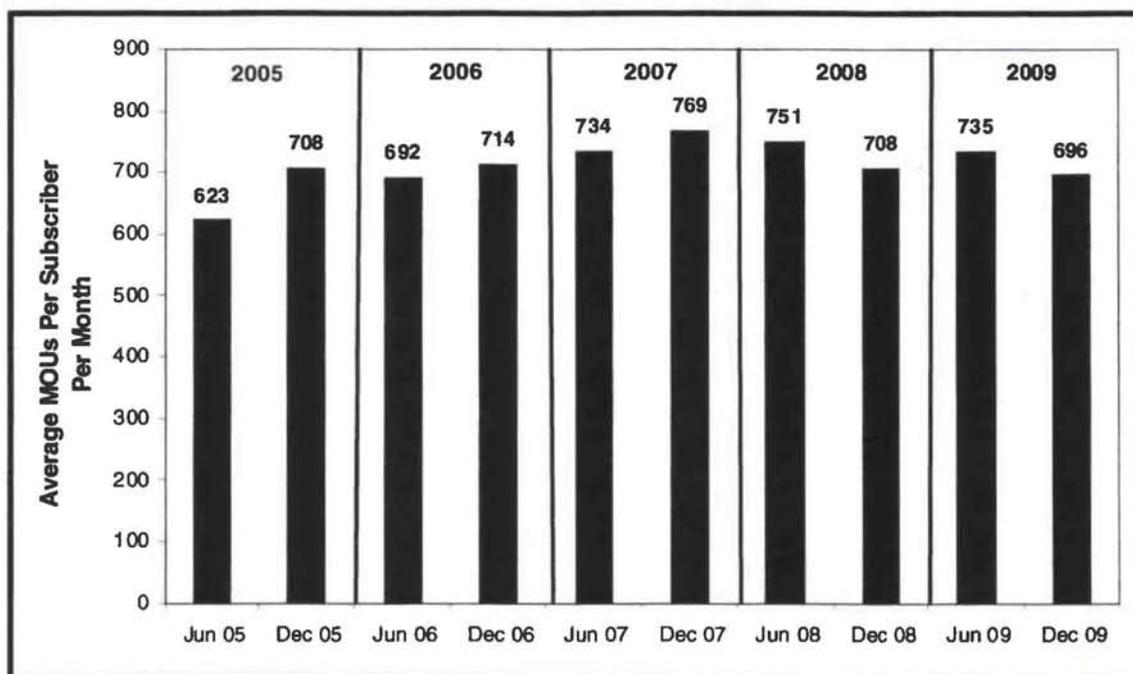
Net Additions by Service Provider<sup>11</sup>Usage

Average monthly mobile voice usage per subscriber continued to decline in 2009, while text and multimedia messaging usage increased (see charts below). While the data currently available to the Commission on mobile data traffic for the United States are limited, one firm has estimated that mobile data traffic in North America averaged 16,022 terabytes (TB) per month in 2009, two and a half times larger than the 2008 average of 6,282 TB per month.<sup>12</sup> Based on this estimate, one analyst claims that total mobile wireless network traffic was evenly split between voice and data as of June 2010. This analyst also estimates that average monthly data traffic per subscriber grew 78 percent from 138 MB in 2008 to 245 MB in 2009.

<sup>11</sup> Includes wholesale subscribers. *Pro-forma* calculations were made to account for mergers and show only “organic” net adds generated independent of mergers. For instance, Verizon Wireless’s reported net additions for 2009, including the subscribers acquired from Alltel, totaled 19,193,000.

<sup>12</sup> See Section V.C, Output and Usage Levels, *infra*, for a complete discussion.

## Average Voice MOUs Per Subscriber Per Month



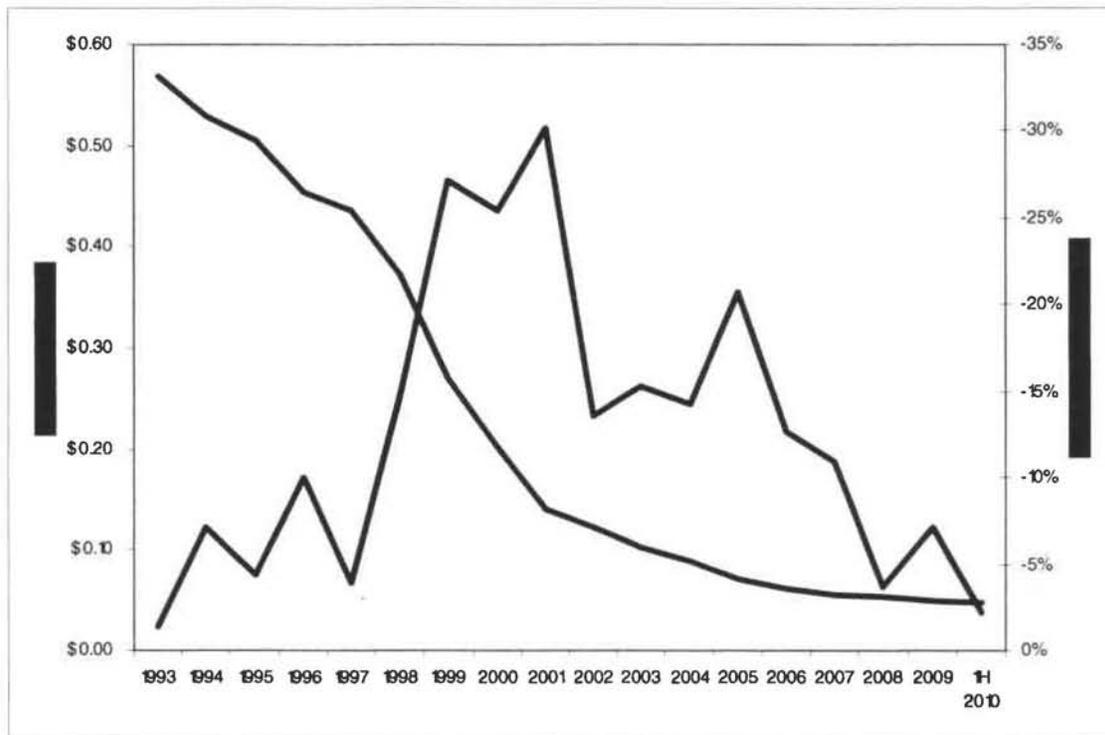
## Average Text and MMS Messages Per Subscriber Per Month

Six-Month Period Ending	Average Text Messages Per User Per Month	Average MMS Messages Per User Per Month
Jun-05	29	0.3
Dec-05	40	0.7
Jun-06	51	0.9
Dec-06	69	1.2
Jun-07	103	1.8
Dec-07	144	2.3
Jun-08	248	3.6
Dec-08	388	5.8
Jun-09	451	6.3
Dec-09	488	14.4

**Price Metrics**

Two measures of pricing for wireless services – the Cellular Consumer Price Index (CPI) and unit price (revenue per user per month divided by average unit consumption per month) – show that the price level remained generally flat during 2009. After declining every year since 1997, the annual Cellular CPI was unchanged during 2009, while the overall CPI decreased by 0.4 percent. In addition, average voice revenue per minute (RPM), rounded to the nearest cent, remained at \$0.05 for the third straight year. While voice RPM has declined dramatically over the past 17 years, the rate of per-minute price declines has been varied considerably from year to year, and has decreased in recent years, as shown in the chart below.

## Mobile Wireless Voice Revenue per Minute: 1993-2010



We are not able to estimate the average price per text message this year because the industry has stopped reporting text messaging revenues separately from overall data service revenues. One analyst, however, has estimated that price per text yields dropped for the fifth consecutive year to \$0.009 in 2009, a 25 percent decline from the previous year. Given the limited data available to the Commission on mobile data traffic, we are not able to estimate an industry-wide unit price for non-messaging mobile data services for 2009. However, one analyst has estimated that, as of mid-2010, typical price-per-MB for unlimited data plans on smartphones ranged from \$0.02 to \$0.15, and the typical price-per-MB for data plans for laptops and wireless data cards ranged from \$0.01 to \$0.08.<sup>13</sup>

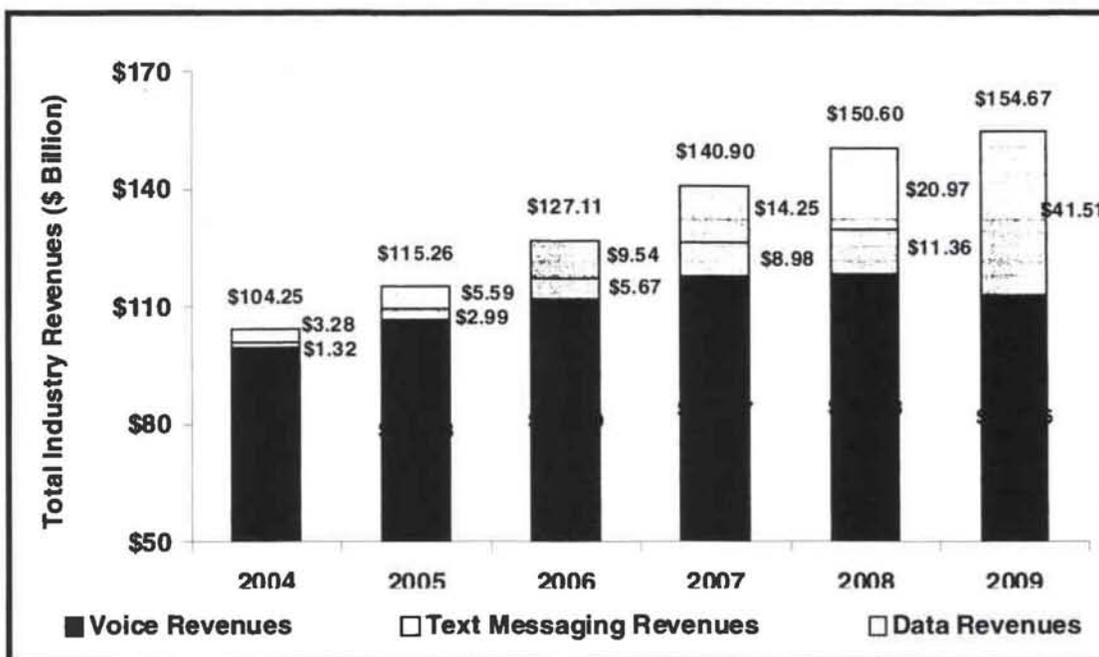
### Industry Revenue and Average Revenue Per User (ARPU)

The total revenue generated by the mobile wireless industry is substantial, approximately \$154.7 billion in service revenues in 2009, and has been growing consistently.<sup>14</sup> In 2009, the mobile wireless ecosystem comprised 21.8 percent of the total revenues of the U.S. information and communications technology (ICT) industry, up from 19.9 percent in 2008. While the revenues of the ICT industry declined 5.7 percent from 2008 to 2009, the revenues attributable to wireless increased 3.3 percent. The annual revenue growth rates in recent years, however, have been slowing – 2009 revenues were three percent greater than 2008, as contrasted with almost seven percent growth between 2007 and 2008. Annual voice revenues declined for the first time in 2009, by approximately four percent, from \$118 billion to \$113 billion. At the same time, data revenue increased 28 percent from \$32 billion to \$42 billion.

<sup>13</sup> See Section V.D.1, Price Indicators, *infra*, for a complete discussion.

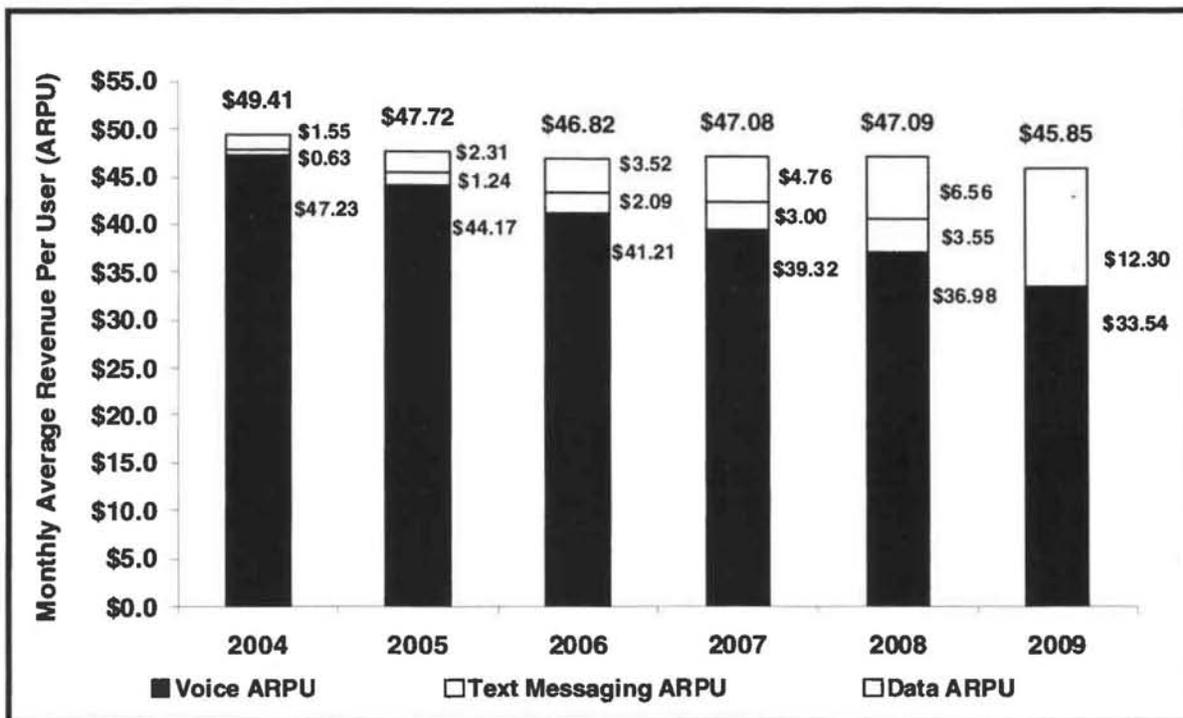
<sup>14</sup> Dollar figures stated in this *Report* have not been adjusted for inflation (*i.e.*, they are nominal dollars) unless stated otherwise.

**Total Mobile Wireless Industry Revenues**



After remaining unchanged in 2008, total ARPU declined nearly three percent in 2009 from \$47.09 to \$45.85. In 2009, total revenue was broken into voice service and data service revenue, and voice ARPU declined nine percent from \$36.98 to \$33.54. Total data service ARPU rose 22 percent from \$10.11 in 2008 to \$12.30 in 2009, and accounted for 27 percent of ARPU in 2009. In 2008 and prior years, total data revenue collected by industry was broken into messaging revenue and other data service revenue. However, as previously discussed, because this was not done in 2009, we are not able to estimate separate monthly ARPUs for messaging and non-messaging data services.

**Monthly ARPU by Type of Service**

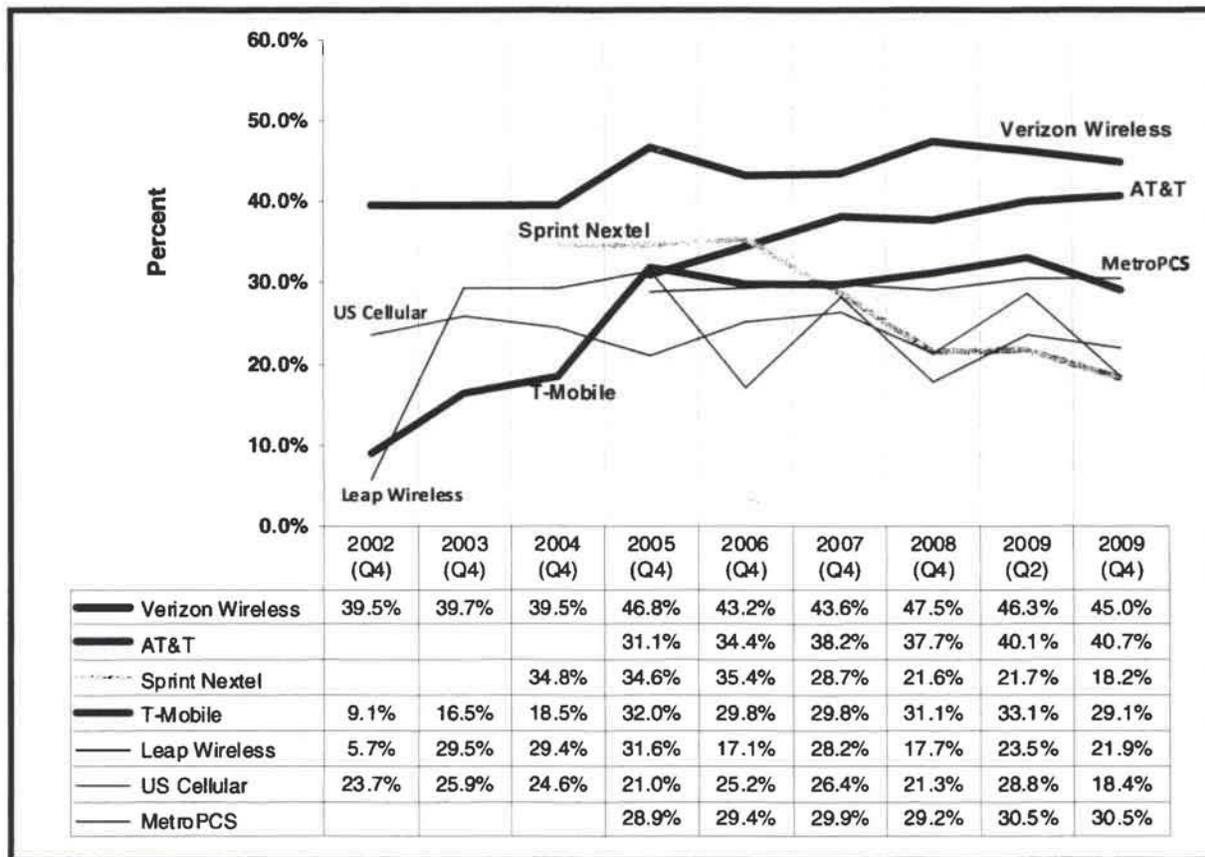


### Profitability Metrics

In the absence of the data necessary to estimate economic profits, there are various measures used by industry observers to estimate accounting profits in the wireless industry. One such metric, based on company data reported to the Securities and Exchange Commission, is EBITDA (Earnings before Interest, Taxes, Debt, and Amortization) – which equals accounting profits before deducting interest expenses, corporate income taxes, depreciation, and amortization. In November 2010, it was reported that AT&T and Verizon Wireless together accounted for more than 80 percent of wireless industry EBITDA during the third quarter of 2010.<sup>15</sup>

A second indicator of mobile wireless segment profitability is EBITDA margin, which is EBITDA as a percentage of service revenue. Standardizing EBITDA by service revenues facilitates cross-provider comparisons. In 2009, the difference between the provider with the highest EBITDA margin (Verizon Wireless) and the provider with the lowest (Sprint Nextel) was 26.8 percent. Since 2007, the two largest national providers have been the only providers with EBITDA margins greater than 35 percent.

**Reported EBITDA Margins: 2002 – 2009 (Selected Providers)**

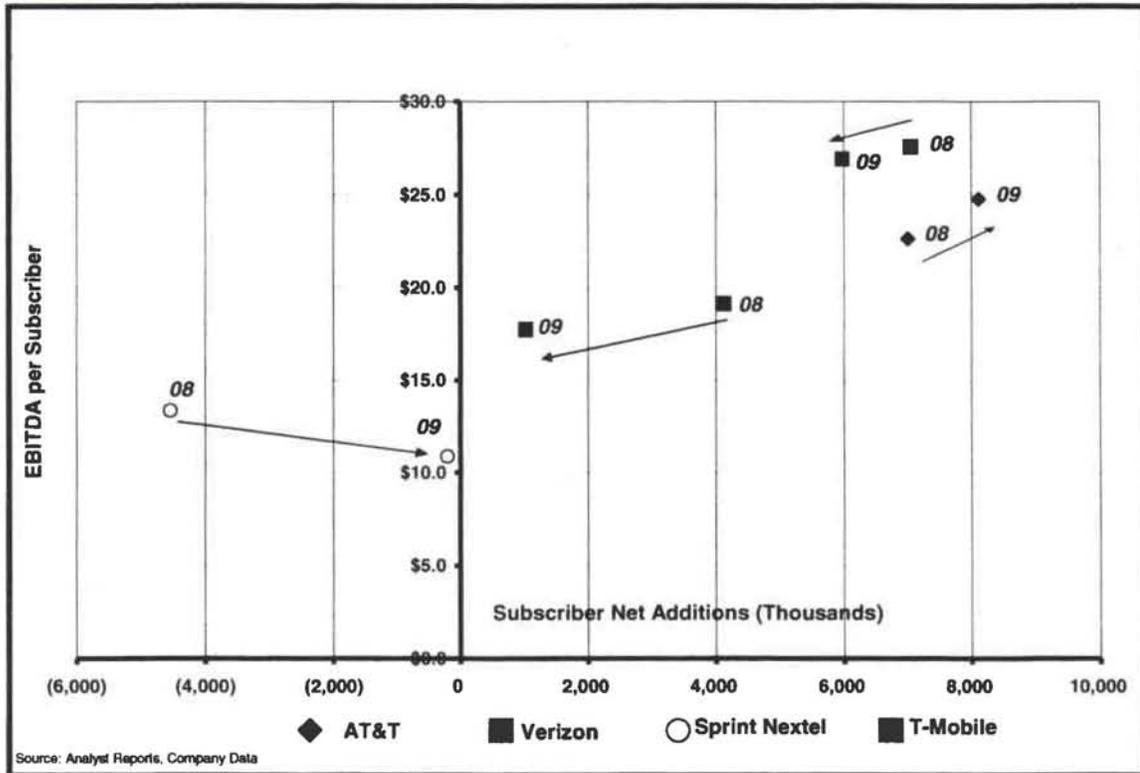


In looking at the annual EBITDA per subscriber versus net adds of the four nationwide service providers, we find that the two largest service providers, AT&T and Verizon Wireless, have both the highest EBITDA per subscriber and the highest net adds. AT&T experienced increases in both net adds and

<sup>15</sup> See Section V.G, Profitability, *infra*, for a complete discussion.

EBITDA per subscriber during 2009, while Verizon Wireless's EBITDA per subscriber and net adds declined slightly during 2009. T-Mobile's net adds declined significantly from just over 4 million in 2008 to around 1 million in 2009. At the same time, the company's EBITDA per subscriber also dropped slightly and remained in the \$15 to \$20 range. Sprint Nextel's net adds improved during 2009, but the company failed to break into positive territory and its EBITDA per subscriber fell to nearly \$10.

**Subscriber Additions vs. EBITDA Per Subscriber: 2008-2009**



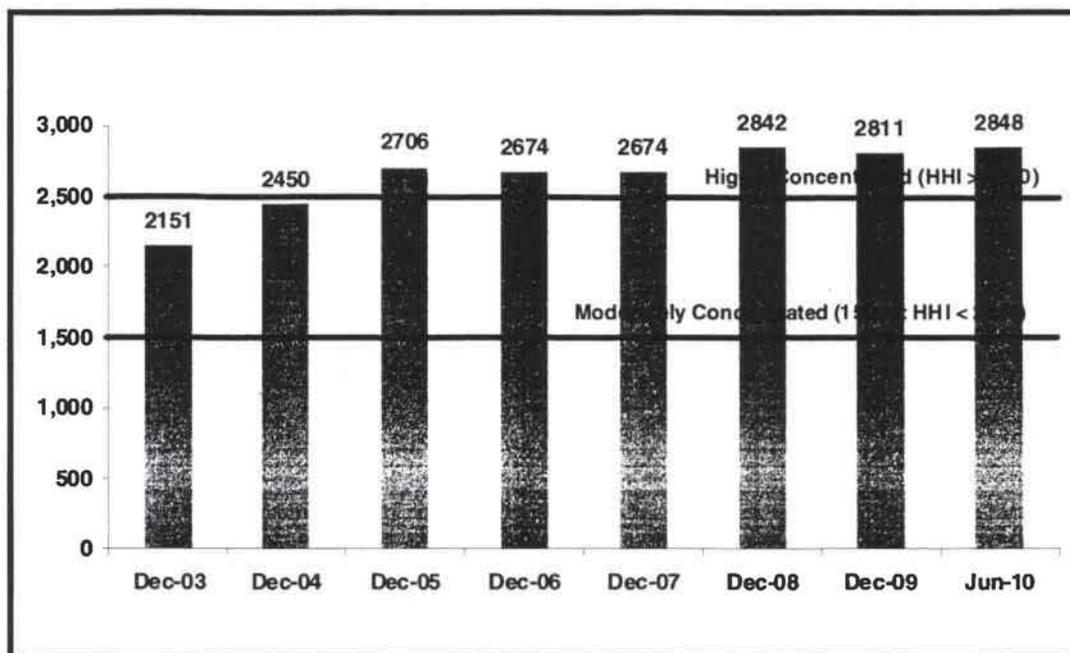
### Market Concentration

The Herfindahl-Hirschman Index (HHI), which is calculated by summing the squared market shares of all firms in any given market, is a commonly used measure of industry concentration. Antitrust authorities in the United States generally classify markets into three types: Unconcentrated ( $HHI < 1500$ ), Moderately Concentrated ( $1500 < HHI < 2500$ ), and Highly Concentrated ( $HHI > 2500$ ).<sup>16</sup>

In the mobile wireless services industry, the weighted average of HHIs (weighted by population across the 172 Economic Areas in the United States) was 2811 at the end of 2009, compared to 2842 at the end of 2008. Both the lowest HHI values and the highest HHI values by Economic Area decreased in 2009 relative to 2008. From 2003 (the first year the Commission calculated HHIs) to 2009, the average HHI has increased from 2151 to 2811, an increase of 660 points. As of mid-2010, the weighted average of the HHIs has increased to 2848, slightly higher than the year-end 2008 level.

<sup>16</sup> See *Horizontal Merger Guidelines*, United States Department of Justice and the Federal Trade Commission, <http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf>. See Section III.C.2, Herfindahl-Hirschman Index, *infra*.

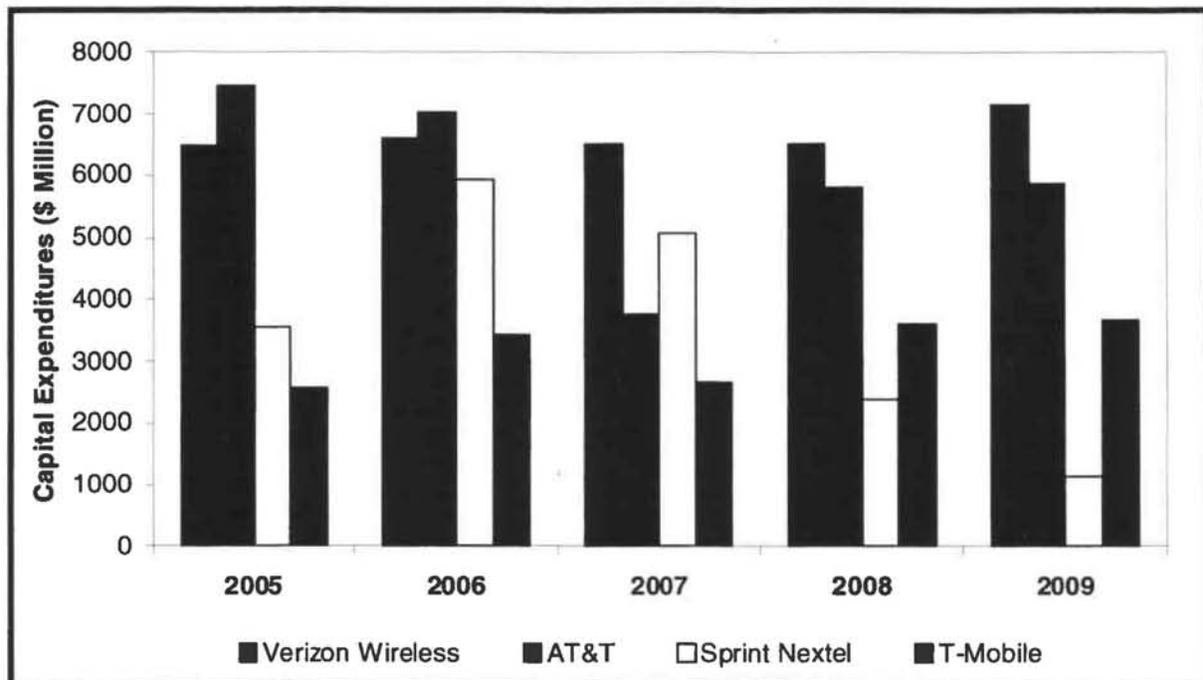
## Average Herfindahl-Hirschman Index

**Investment**

Annual incremental capital investment by the wireless industry, as reported by CTIA and the U.S. Census Bureau, has varied between \$20 billion and \$25 billion over the past five years. According to CTIA, capital investment increased slightly from \$20.2 billion in 2008 to \$20.4 billion in 2009. Census Bureau estimate of wireless industry capital expenditures in 2009 was similar at \$20.65 billion. While this represents an 18 percent decrease from \$25.6 billion in 2008, in both 2008 and 2009, the wireless sector continued to account for more than 30 percent of all telecom investment, a quarter of all information/communication industry investment, and two percent total investment in the U.S. economy.

Wireless capital investment as a percentage of total wireless industry revenue continued to decline in 2009 from 14 percent to 13 percent. Capital expenditures also have varied significantly from operator to operator, as shown below.

## Capital Expenditures by Service Provider

**Network Quality**

The Commission has recognized the importance of accurate, up-to-date data on mobile network performance – to inform policy, to help consumers make better choices, and to spur competition. The measurement and representation of the overall quality of a provider’s network, however, present a number of challenges. For instance, there is neither a single definition of network quality nor a definitive method to measure it. For voice services, aspects of network quality include the strength and coverage of the provider’s signal, voice call quality, and the reliability of the network connection, while aspects of network quality for data services also include throughput rates and latency. In addition, the service quality experienced by consumers may vary with time of day, weather, foliage, user location, interference, or network parameters, as well as according to the particular application and/or device being used. The network quality information published by service providers, such as coverage maps and data throughput rates, are most often based on statistical assumptions of network capabilities.

We note that network providers and others gather data on the actual network performance of mobile wireless providers in several ways, including through consumer surveys, network drive tests, fixed probes, internal network level assessments, and the use of crowd-sourcing applications. These methods continue to evolve, and several independent studies have reported network performance measurements for mobile wireless data providers. However, the public data they provide are limited in scope and are not yet robust enough to provide detailed and standardized results.

To help facilitate the availability of better mobile network performance information, during 2010 the Commission released a consumer broadband test for certain smartphone models that collects and reports broadband performance metrics, sought comment on the measurement of mobile broadband network performance and coverage, and solicited information from entities that can provide mobile broadband performance measurement and mapping services or data that represent the performance of mobile broadband networks across the United States.

## **Spectrum**

As mobile wireless data usage grows, spectrum becomes an increasingly important input for mobile broadband networks, affecting the ability of service providers to compete in the delivery mobile broadband service. As noted in a recent Commission staff paper, current spectrum forecasts suggest that mobile broadband growth will likely outpace technology and network improvements by an estimated factor of three, leading to a spectrum deficit that is likely to approach 300 megahertz within the next five years.<sup>17</sup> A service provider's particular mix of spectrum holdings affects how it can provide efficient mobile wireless services. For instance, it is well established that lower frequency spectrum may allow for wider coverage with fewer cell sites, which is key in rural areas, and better in-building coverage, which is especially important in urban areas. Furthermore, as some providers have noted, higher-frequency spectrum may be effective for increasing capacity, particularly within smaller, more densely-populated geographic areas.

Most of the spectrum below 1 GHz suitable for the provision of mobile broadband is held by the two largest mobile wireless service providers. Verizon Wireless and AT&T together hold approximately 90 percent of Cellular spectrum based on megahertz-POPs (MHz-POPs),<sup>18</sup> which was the first band to be licensed for commercial mobile services and has the most extensive network buildout. Verizon Wireless holds 45 percent of the MHz-POPs of Cellular and 700 MHz spectrum combined, while AT&T holds approximately 33 percent. In the Broadband PCS (PCS) and Advanced Wireless Services (AWS) spectrum between 1 GHz and 2.5 GHz, no licensee holds more than 23 percent of the MHz-POPs, with T-Mobile holding the most. In the 2.5 GHz band (which include the Broadband Radio Service (BRS) and Educational Broadband Service (EBS)), Clearwire holds the majority of the spectrum.<sup>19</sup>

## **Backhaul**

Several recent trends in the mobile wireless industry have increased the demand for backhaul capacity. First, the increased adoption of smartphones and other Internet-capable mobile devices is leading to the consumption of greater amounts of data. Second, the proliferation of fixed-price mobile Internet access plans enables subscribers to consume more services and greater bandwidth. Third, mobile wireless network data speeds have increased as technology has evolved, with current and future launches of 4G WiMAX and LTE networks supporting even higher data throughput rates and lower latencies. In light of this, identifying solutions to satisfy the growing demand for mobile backhaul is increasingly important.

## **Handsets and Devices**

One way in which mobile wireless service providers and handset manufacturers compete is with their handset and device offerings. Service providers compete in this area by introducing new handsets/devices, distinguishing their handset/device offerings from those of their competitors, responding to competitors' handset/device innovations with rival offerings, offering certain handset/device models on an exclusive basis, and allowing handsets/devices that they do not sell directly to be used on their networks. During 2009 and much of 2010, service providers and device manufacturers launched several new devices – including smartphones, tablets, wireless modem cards, and mobile Wi-Fi

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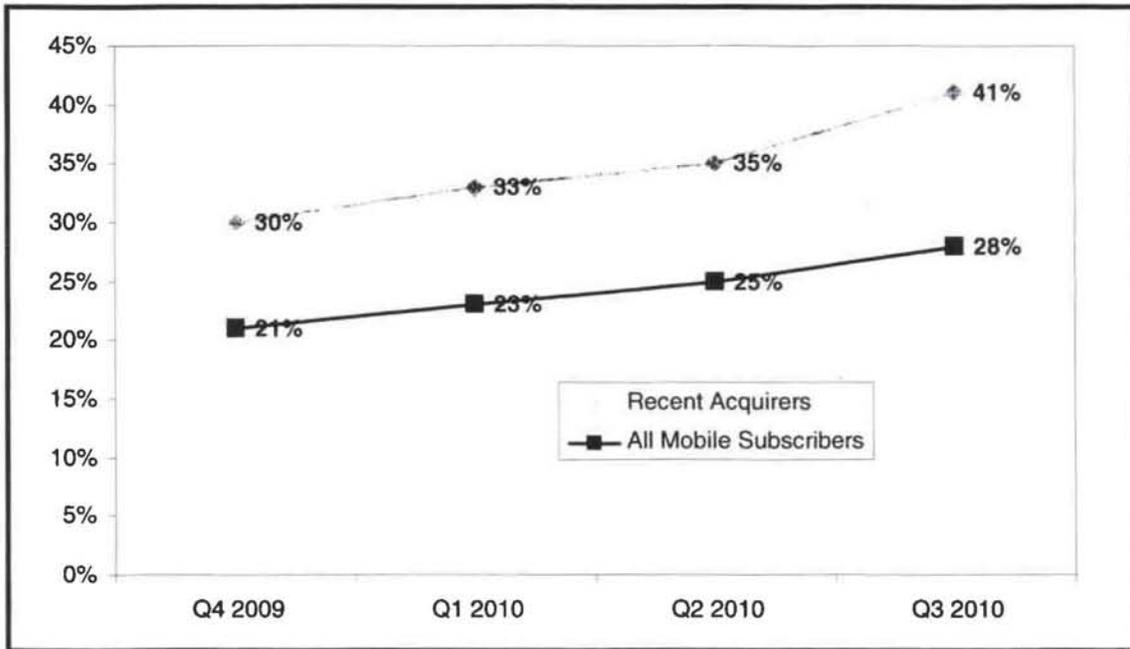
<sup>17</sup> See Section VII.A.1, Spectrum, *infra*.

<sup>18</sup> "MHz-POPs" refers to the amount of spectrum in a given license or set of frequencies multiplied by the population covered by the geographic area of the spectrum license. For example, the MHz-POPs of a 20 megahertz license covering a geographic area with a population of 1,000 would be 20,000.

<sup>19</sup> 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. 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.

hotspots – that enable consumers to use data services more quickly and easily while mobile. As shown below, smartphone penetration rates have increased over the past year.

**Smartphone Penetration Rates in the United States Q4 2009 – Q3 2010**



In addition, smartphone operating system/platform developers compete within the mobile wireless ecosystem. During the first eight months of 2010, Google’s share of the smartphone operating system market, with Android, increased from five to nearly 20 percent of smartphones in use. At the same time, the market shares of RIM, Microsoft, and Palm declined while Apple’s remained steady.

**Share of Smartphones in Use by Operating System (U.S.)**

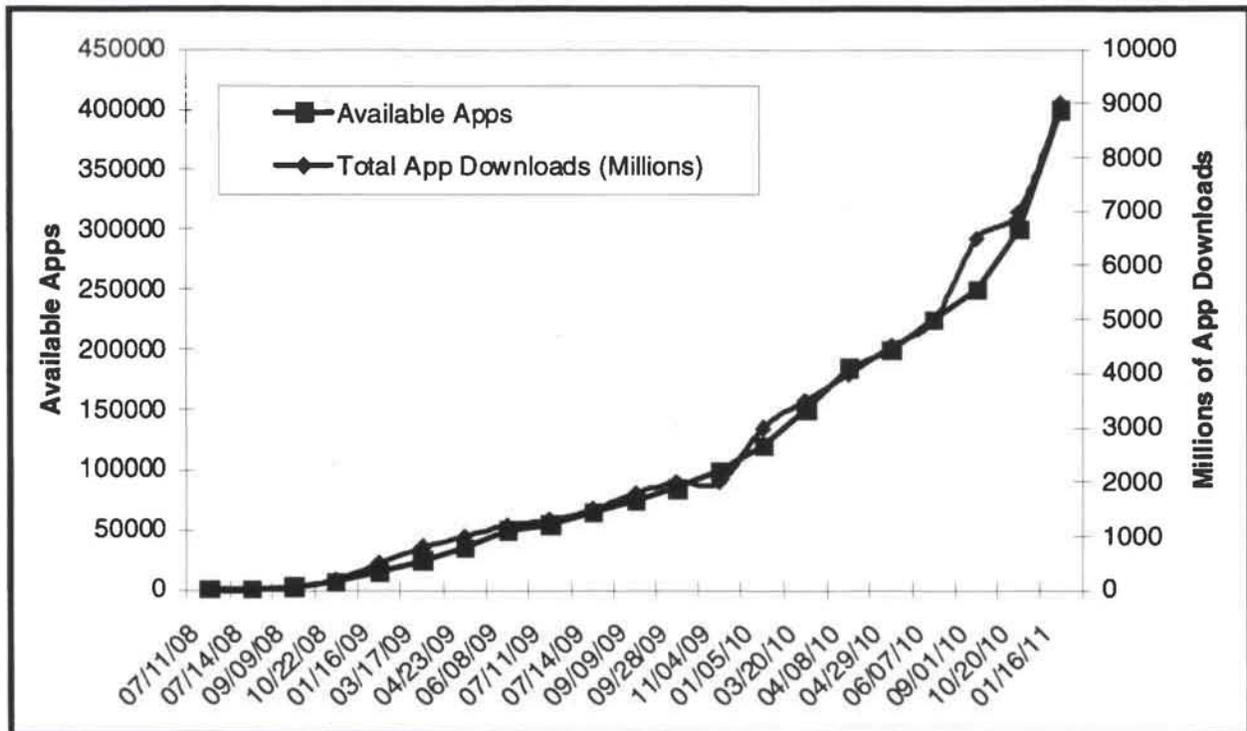
Operating System	Share of Smartphones in Use	
	December 2009	August 2010
RIM	41.6%	37.6%
Apple	25.3%	24.2%
Google	5.2%	19.6%
Microsoft	18.0%	10.8%
Palm	6.1%	4.6%
All Others	3.8%	3.2%

**Mobile Applications**

Both the number of mobile applications launched and the number of applications downloaded by consumers have grown significantly over the past three years. Several application stores have launched within the last three years, each offering thousands of applications for download. For example, as of September 2010, there were over 250,000 applications available from the Apple App Store, a number that more than doubled in less than a year (see chart below). In addition, the total number of applications downloaded from Apple’s App Store grew from 100,000 in 2008 to over 2 billion in 2009, and surpassed 6.5 billion by September 2010, with App Store developers earning over one billion dollars from the sales of their applications in the process. As of September 2010, the more recently created, but rapidly growing Android Market had over 80,000 available applications and had passed one billion total downloads.

Many different types of mobile applications, developed by a range of different third-party developers, are available through mobile application stores and web browsers. The major categories of applications include: web searching, news and information, e-mail and messaging, games, social networking, location-based services, photo sharing, music and video streaming, and VoIP. In addition, thousands of niche applications have been designed for specific uses, hobbies, interests, and industries by various third-party application developers. Analysts believe that one of the major applications driving mobile data usage is social networking. According to comScore, social networking ranked as the fastest-growing mobile content category between April 2009 and April 2010, with the number of mobile consumers using an application to access a social networking website increasing 240 percent to 14.5 million users.

**Apple App Store – Available Apps and App Downloads**



**Intermodal Competition**

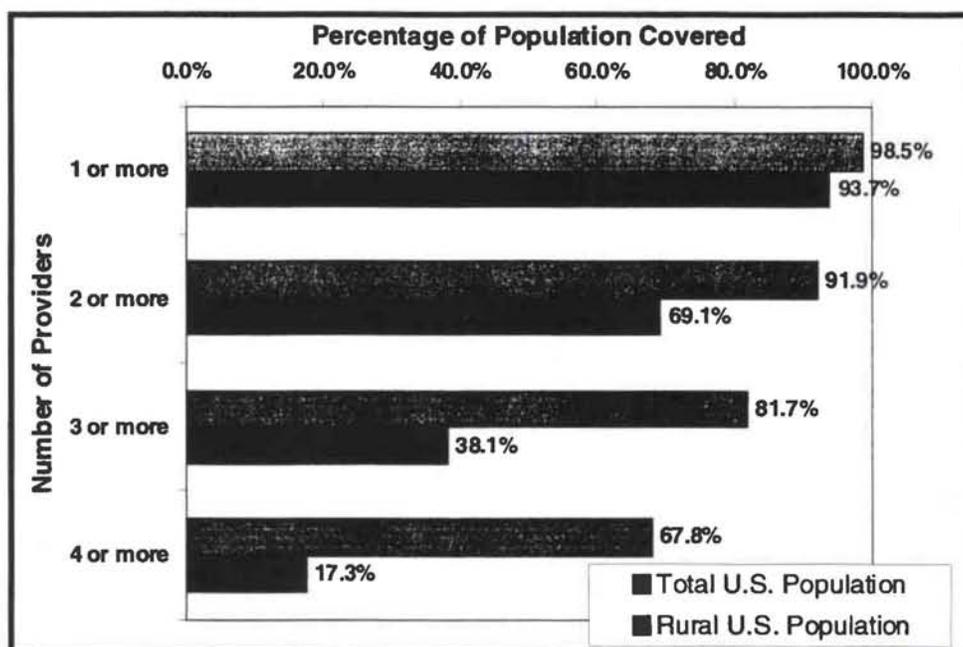
The number of Americans who rely exclusively on mobile wireless for voice service has increased significantly in recent years. According to the January-June 2010 National Health Interview Survey (NHIS), 24.9 percent of all adults lived in households with wireless-only voice connections, up from 21.1 percent in the first half of 2009. When looking at young adults aged 25 to 29, the number is much higher: over 50 percent live in wireless-only households. In addition, the percentage of children living in wireless-only households has increased significantly from 21.3 percent in the first half of 2009 to 29 percent in the first half of 2010.

**Urban-Rural Comparisons**

Rural counties comprise 86 percent of the geographic area of the United States, and account for

approximately 61 million people, or 21 percent of the U.S. population (including Puerto Rico).<sup>20</sup> Although mobile voice and mobile broadband network coverage in rural areas has improved since the *Fourteenth Report*, just over 500,000 people in rural areas had no mobile wireless coverage as of July 2010, and approximately 3.8 million had no mobile broadband coverage as of August 2010. In addition, while 99.2 percent of the rural population is covered by at least one mobile voice provider, and 96.9 percent is covered by at least two providers, there is a disparity in the percentage of rural and total U.S. population covered by more than two mobile voice provider networks. This disparity is even more pronounced when considering mobile broadband service: 82 percent of the total U.S. population is covered by three or more mobile broadband provider networks, compared to just 38 percent of the rural population.

### Mobile Broadband Coverage in Rural Areas



### International Comparisons

In making cross-country comparisons, several trends can be identified. First, market structure is converging to three or four national competitors per market in many countries. Second, the “calling party pays” system used in most other countries tends to result in lower average voice MOUs and higher revenue per minute of voice service (RPM) than the “receiving party pays” system used in the United States. Average monthly voice usage is significantly higher in the United States than in any other country, as shown in the table below. Third, the average monthly subscriber bill in the United States is considerably higher than the average bill in Western Europe, although Japan has a higher average monthly bill than either the United States or Western Europe. Finally, international differences in regulatory policy and the business environment have produced a wide variety of successful models for the mobile wireless sector, with no one model dominating on all dimensions of market performance.

<sup>20</sup> In this *Report*, rural areas are defined to include counties with a population density of 100 people or fewer per square mile.

## 2009 Mobile Market Performance in Selected Countries (Merrill Lynch)

<i>Country</i>	<i>Penetration (% of POPs)</i>	<i>Prepaid (% of Subs)</i>	<i>Voice MOUs per Month</i>	<i>Voice RPM</i>	<i>ARPU</i>	<i>Data (% of ARPU)</i>
<b>Receiving Party Pays</b>						
USA	93%	19%	824	\$0.04	\$49.91	29.3%
Canada	68%	20%	426	\$0.09	\$55.14	22.1%
Singapore	144%	50%	380	\$0.06	\$33.01	31.0%
<b>Calling Party Pays</b>						
UK	129%	59%	194	\$0.11	\$33.52	33.0%
Germany	132%	56%	109	\$0.16	\$22.08	29.8%
Italy	147%	87%	141	\$0.15	\$29.12	26.1%
Sweden	131%	35%	211	\$0.10	\$31.11	25.3%
France	96%	33%	237	\$0.15	\$48.40	23.7%
Finland	144%	13%	218	\$0.13	\$33.52	20.5%
Japan	88%	1%	137	\$0.25	\$58.06	44.5%
South Korea	99%	3%	311	\$0.09	\$33.63	19.1%
Australia	115%	42%	222	\$0.14	\$47.27	36.1%

## II. INTRODUCTION

3. In 1993, Congress created the statutory classification of Commercial Mobile Radio Services<sup>21</sup> (CMRS) to promote the consistent regulation of mobile radio services that are similar in nature.<sup>22</sup> At the same time, Congress established the promotion of competition as a fundamental goal for CMRS policy formation and regulation. To measure progress toward this goal, Congress required the Commission to submit annual reports that analyze competitive conditions in the industry.<sup>23</sup>

4. Congress called on the Commission to report on “competitive market conditions with respect to commercial mobile services.”<sup>24</sup> In particular, the statute requiring the annual report on CMRS competition states:

The Commission shall review competitive market conditions with respect to commercial mobile services and shall include in its annual report an analysis of those conditions. Such analysis shall include an identification of the number of competitors in various commercial mobile services, an analysis of whether or not there is effective competition, an analysis of whether any of such competitors have a dominant share of the market for such services, and a statement of whether additional providers or classes of providers in those services would be likely to enhance competition.<sup>25</sup>

To comply with Congress’s mandate to assess competitive market conditions, this *Report*, like the *Fourteenth Report*, undertakes an expansive and detailed analysis of the entire mobile wireless industry. First, this *Report* integrates an analysis of CMRS into an analysis of all mobile wireless services, including voice, messaging, and broadband. These services often jointly use the same spectrum, network facilities, and customer equipment, and many mobile service providers have integrated the marketing of these services, often offering them in bundles. Many providers of CMRS offer a variety of mobile data services, including mobile broadband Internet access service, which is not classified as “CMRS,”<sup>26</sup> and

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<sup>21</sup> Commercial Mobile Services came to be known as the Commercial Mobile Radio Services, or “CMRS.” CMRS includes a large number of terrestrial services and some mobile satellite services. See 47 C.F.R. § 20.9(10).

<sup>22</sup> The Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, § 6002(b), amending the Communications Act of 1934 and codified at 47 U.S.C. § 332(c). As in the past, this *Report* bases its analysis on a consumer-oriented view of mobile services by focusing on specific product categories, regardless of their regulatory classification. In some cases, this includes an analysis of offerings outside the umbrella of “services” specifically designated as CMRS. However, because these other services can affect competition in the CMRS market and because providers of these other services can compete with CMRS providers, the Commission has indicated that it is important to consider them in the analysis. As the Commission said, paraphrasing the Department of Justice/Federal Trade Commission guidelines on merger review, “When one product is a reasonable substitute for the other in the eyes of consumers, it is to be included in the relevant product market even though the products themselves are not identical.” Application of Echostar Communications Corporation, General Motors Corporation, and Hughes Electronics Corporation (Transferors) and Echostar Communications Corporation (Transferee), *Hearing Designation Order*, 17 FCC Rcd 20559, 20606, ¶ 106 (2002).

<sup>23</sup> 47 U.S.C. § 332(c)(1)(C).

<sup>24</sup> 47 U.S.C. § 332(c)(1)(C). As noted in previous *Reports*, any individual proceeding in which the Commission defines relevant product and geographic markets, such as an application for approval of a license transfer, may present facts pointing to narrower or broader markets than any used, suggested, or implied in this *Report*. See, e.g., 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, 2252, n. 5 (2008) (*Twelfth Report*).

<sup>25</sup> 47 U.S.C. § 332 (c)(1)(C).

<sup>26</sup> In 2007, the Commission classified wireless broadband Internet access service as an information service under the Communications Act and found that wireless broadband Internet access service using mobile technologies was not a (continued....)

other mobile data services whose regulatory status the Commission has not addressed.<sup>27</sup> Also, consumers are increasingly substituting among voice, messaging, and data services, and, in particular, are willing to move from voice to messaging or data services for an increasing portion of their communication needs.

5. In addition, as the mobile wireless services industry has transitioned from one centered on interconnected mobile voice communications to one that produces an array of voice, messaging, and broadband services, the number of related mobile wireless industry segments involved in bringing these information products to mobile consumers has grown and evolved. These interrelated market segments form the mobile wireless ecosystem, the various parts of the supply and production network that bring thousands of mobile wireless products to Americans every day. Each of the segments in the mobile wireless ecosystem has the potential to affect competitive and consumer outcomes in the mobile wireless services segment. As the ecosystem has evolved, so have the Commission's *Competition Reports*.<sup>28</sup> This *Report* analyzes competition across the entire mobile wireless ecosystem, including the "upstream" and "downstream" market segments, such as spectrum, infrastructure, devices, and applications. As discussed in detail below, this *Report's* detailed assessment of competitive market conditions required by the Act is founded upon an expanded view of the mobile wireless services marketplace and an examination of competition across the entire mobile wireless ecosystem.

6. Figure 1 below provides an overview of the mobile wireless ecosystem and the corresponding sections of the *Fifteenth Report* in which each of the ecosystem segments is discussed. The input segments are divided into spectrum, towers, network equipment, and backhaul facilities.<sup>29</sup> These segments can affect entry, competition, output, or prices in the provision of mobile wireless services. Following these inputs, the transmission of mobile wireless services includes voice services, messaging services,<sup>30</sup> and data services (including broadband). The downstream segments include mobile

(Continued from previous page)

"commercial mobile service" as defined in the Act. Appropriate Regulatory Treatment for Broadband Access to the Internet over Wireless Networks, WT Docket No. 07-53, *Declaratory Ruling*, 22 FCC Rcd 5201 (2007).

<sup>27</sup> Note that the regulatory classification of a particular wireless service offered by a CMRS carrier is determined on a case-by-case basis. See Amendment of the Commission's Rules to Permit Flexible Service Offerings in the Commercial Mobile Radio Service, WT Docket No. 96-6, *Second Report and Order and Order on Reconsideration*, 15 FCC Rcd 14680, 14683, ¶ 7, 14687, ¶ 15 (2000). Aside from broadband Internet access service, the regulatory classification of services and applications that rely on Internet Protocol (IP-enabled services) is pending. See IP-Enabled Services, WC Docket No. 04-36, *Notice of Proposed Rulemaking*, 19 FCC Rcd 4863 (2004). In addition, the Wireless Telecommunications Bureau has sought comment on a petition seeking clarification on the regulatory classification of text messaging services. See "Wireless Telecommunications Bureau Seeks Comment on Petition for Declaratory Ruling That Text Messages and Short Codes Are Title II Services or Are Title I Services Subject to Section 202 Non-Discrimination Rules," *Public Notice*, 23 FCC Rcd 262 (WTB 2008).

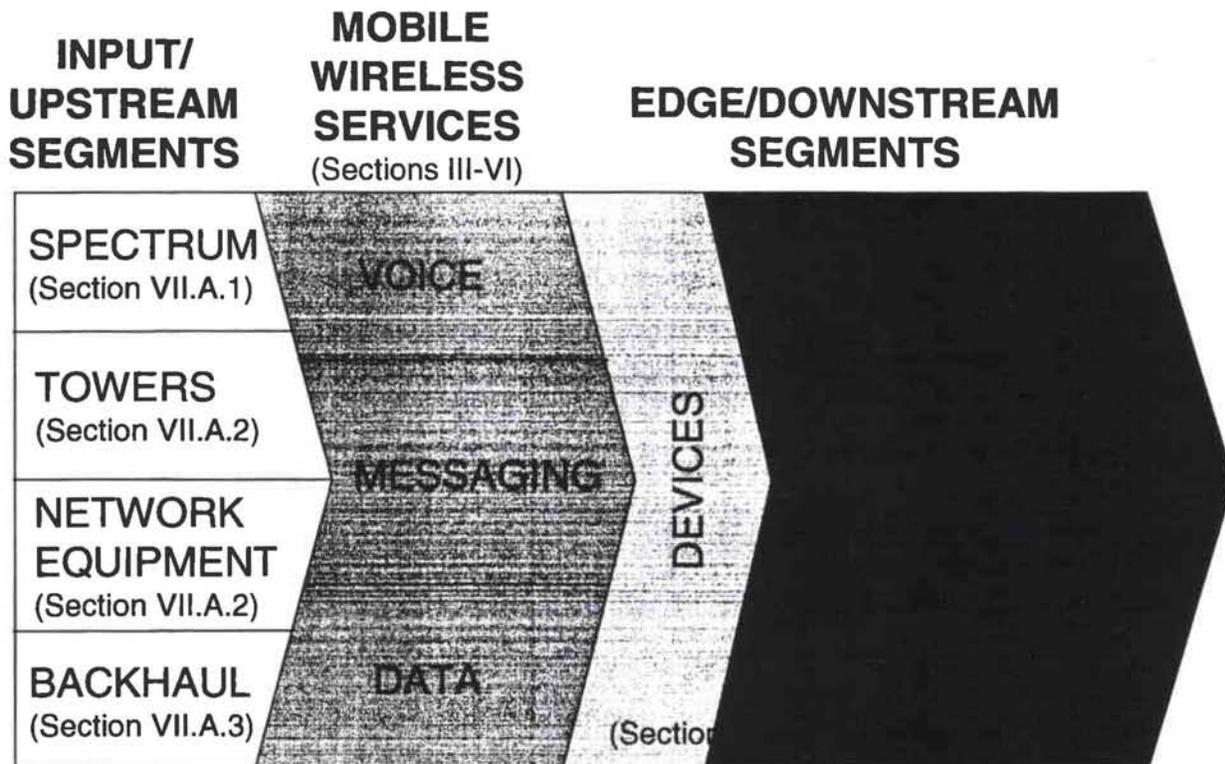
<sup>28</sup> See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *First Report*, 10 FCC Rcd 8844 (1995); *Second Report*, 12 FCC Rcd 11266 (1997); *Third Report*, 13 FCC Rcd 19746 (1998); *Fourth Report*, 14 FCC Rcd 10145 (1999); *Fifth Report*, 15 FCC Rcd 17660 (2000); *Sixth Report*, 16 FCC Rcd 13350 (2001); *Seventh Report*, 17 FCC Rcd 12985 (2002); *Eighth Report*, 18 FCC Rcd 14783 (2003); *Ninth Report*, 19 FCC Rcd 20597 (2004); *Tenth Report*, 20 FCC Rcd 15908 (2005); *Eleventh Report*, 21 FCC Rcd 10947 (2006); *Twelfth Report*, 23 FCC Rcd 2241; *Thirteenth Report*, 24 FCC Rcd 6185 (2009) (*Thirteenth Report*); *Fourteenth Report*, 25 FCC Rcd 11407 (2010) (*Fourteenth Report*). The reports can also be found on the Commission's website at [http://wireless.fcc.gov/index.htm?job=cmrs\\_reports](http://wireless.fcc.gov/index.htm?job=cmrs_reports).

<sup>29</sup> Spectrum, towers, network equipment, and backhaul facilities can be viewed as input or upstream markets because of their input relation to mobile wireless networks.

<sup>30</sup> Messaging includes text and multimedia (photo and video) message services, also referred to as SMS (Short Message Service) and MMS (multimedia messaging services), respectively.

devices, device operating systems, and mobile applications, content, and mobile commerce.<sup>31</sup> Mobile devices, the endpoints of mobile networks, connect consumers to the network. They can include traditional voice-centric handsets, devices that offer both voice and data services, as well as devices that provide data but not circuit-switched voice service, such as modem cards for portable computers and e-readers. Riding on the networks of the mobile wireless ecosystem are the information products that are consumed directly by subscribers – mobile applications, content (e.g., video and music files, web sites, photos, and documents), and mobile commerce (e.g., electronic shopping and financial transactions using a mobile device). The importance of the downstream segments to consumers’ mobile wireless experience is increasing with the deployment of mobile broadband networks that support Internet-based applications.

**Figure 1**  
**Mobile Wireless Ecosystem**



7. In this *Report*, the discussion of the middle part of the mobile wireless ecosystem – mobile wireless services – includes a detailed analysis of mobile wireless service market conditions in the CMRS marketplace, as required by Section 332(c) of the Act. As discussed above, the statute requires an identification of the number of competing providers of the various commercial mobile services, an analysis of whether there is effective competition, an analysis of whether any of the competitors has a dominant share of the market for the services, and a statement of whether additional providers or classes of providers in the services would be likely to enhance competition. Therefore, this *Report’s* competitive analysis of mobile wireless services considers data that provide information on whether any wireless service provider is exercising undue market power – the ability to profitably charge prices above cost for

<sup>31</sup> Mobile devices, device operating systems, and mobile applications, content, and mobile commerce can be viewed as edge or downstream markets because they are products that utilize mobile wireless services.