

July 2010

TELECOMMUNICATIONS

Enhanced Data
Collection Could Help
FCC Better Monitor
Competition in the
Wireless Industry



GAO

Accountability * Integrity * Reliability



Highlights of [GAO-10-779](#), a report to congressional requesters

Why GAO Did This Study

Americans increasingly rely on wireless phones, with nearly 40 percent of households now using them primarily or solely. Under federal law, the Federal Communications Commission (FCC) is responsible for fostering a competitive wireless marketplace while ensuring that consumers are protected from harmful practices. As requested, this report discusses changes in the wireless industry since 2000, stakeholders' perceptions of regulatory policies and industry practices, and the strategies FCC uses to monitor competition. To conduct this work, GAO collected and analyzed data and documents from a variety of government and private sources; conducted case studies in both rural and urban areas of four states; and interviewed stakeholders representing consumers, local and state agencies and officials, and various segments of the industry.

What GAO Recommends

FCC should assess whether expanding original data collection of wireless industry inputs and outputs—such as prices, special access rates, capital expenditures, and equipment costs—would help the Commission better satisfy its requirement to review competitive market conditions with respect to commercial mobile services. FCC took no position on GAO's recommendation, but provided technical changes to this report that were incorporated as appropriate.

[View GAO-10-779](#) or [key components](#). For more information, contact Mark Goldstein at (202) 512-2834 or goldsteinm@gao.gov.

TELECOMMUNICATIONS

Enhanced Data Collection Could Help FCC Better Monitor Competition in the Wireless Industry

What GAO Found

The biggest changes in the wireless industry since 2000 have been consolidation among wireless carriers and increased use of wireless services by consumers. Industry consolidation has made it more difficult for small and regional carriers to be competitive. Difficulties for these carriers include securing subscribers, making network investments, and offering the latest wireless phones necessary to compete in this dynamic industry. Nevertheless, consumers have also seen benefits, such as generally lower prices, which are approximately 50 percent less than 1999 prices, and better coverage.

While views differed among stakeholders, some carriers and consumer groups perceive certain FCC wireless policies as having prevented the entry and growth of small and regional carriers, though it is difficult to assess some of these issues without better data. In particular, many stakeholders outside of the top national carriers who we spoke with noted that policies for making spectrum available for commercial use, as well as policies governing some essential elements of wireless networks, favor large national carriers, potentially jeopardizing the competitiveness of the wireless industry. One such essential element is special access to infrastructure that connects cell phone towers to wireline phone networks. Better data on rates governing those elements would clarify the extent to which competition is hindered. Additional data are also necessary to determine whether consumers are hindered from moving between wireless carriers by particular industry practices. Many small carriers and consumer groups perceive early termination fees associated with wireless service contracts and exclusive handset arrangements as creating switching costs that serve as barriers to consumer movement.

FCC uses three strategies to oversee and monitor competition in the wireless phone industry: reviews of proposed mergers, investigations of competitive challenges, and its annual wireless competition report to Congress. In assessing mergers, FCC balances potential public interest benefits and harms. FCC has also undertaken a variety of investigations and inquiries related to competitive challenges, generally in response to complaints. The primary tool that FCC uses is the annual wireless competition report. While FCC recently undertook steps that significantly improved this report, it still does not fully assess some key industry inputs and outputs. FCC generally has not collected data on many industry investments or consumer switching costs because of the complexity and burden associated with gathering these data. However, FCC has recently undertaken ad hoc inquiries to collect such data and, despite challenges and costs, this information could help FCC better fulfill its statutory reporting requirement. In particular, additional data could help assess the competitiveness of small and regional carriers, as well as shed light on the impact of switching costs for consumers.

Contents

Letter		1
	Background	4
	Since 2000, the Wireless Industry Has Consolidated and Usage Has Increased, Creating Challenges for Small and Regional Wireless Carriers and Some Benefits for Consumers	10
	Some Stakeholders Perceive Certain Regulatory Policies and Industry Practices Jeopardizing the Competitiveness of the Wireless Industry	26
	FCC Employs Various Strategies to Monitor Competition in the Industry, but Its Annual Report Is Missing Some Data on Inputs and Outputs	39
	Conclusions	44
	Recommendation for Executive Action	45
	Agency Comments	45
Appendix I	Scope and Methodology	48
Appendix II	GAO Contact and Staff Acknowledgments	52
Tables		
	Table 1: Stakeholders Interviewed for this Report	49
	Table 2: Cellular Market Areas (CMA) Used as Case Studies	50
Figures		
	Figure 1: Key Components of a Mobile Phone System	6
	Figure 2: Mergers of Select Wireless Carriers, 2000-2009	12
	Figure 3: Wireless Subscriber Market Share	13
	Figure 4: Estimated Wireless Penetration Rate	15
	Figure 5: Estimated Wireless Phone Subscribers	16
	Figure 6: Estimated Wireless Voice Minutes of Use	17
	Figure 7: Net Subscriber Additions by Carrier	18
	Figure 8: Wireless Subscriber Churn	19
	Figure 9: Capital Expenditures as a Percentage of Revenue	21
	Figure 10: Average Revenue per User	23
	Figure 11: Consumer Price Index for Telephone and Wireless Services	25

Figure 12: Spectrum License Maps	28
Figure 13: Proposed Cap of Spectrum Below 2.3 GHz	31
Figure 14: Disguised Cellular Tower in Eureka, California	37

Abbreviations

ARPU	Average Revenue per User
CDMA	Code-Division Multiple Access
CMA	Cellular Market Area
DOJ	Department of Justice
ETF	early termination fee
FCC	Federal Communications Commission
GHz	gigahertz
GSM	Global System for Mobile Communication
HHI	Herfindahl-Hirschman Index
ILEC	Incumbent Local Exchange Carrier
LNP	local number portability
MHz	megahertz
MSA	Metropolitan Statistical Area
MVNO	mobile virtual network operators
REA	Regional Economic Area
RSA	Rural Service Area
USF	Universal Service Fund

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



United States Government Accountability Office
Washington, DC 20548

July 27, 2010

Congressional Requesters

Wireless phone use in the United States has risen dramatically over the last 20 years, and Americans increasingly rely on wireless phones as their sole or primary means of telephone communication. According to industry data, the total number of wireless phone service subscribers nationwide has grown from about 3.5 million in 1989 to about 285 million by the end of 2009.¹ Today, nearly 40 percent of households rely primarily on wireless devices, and the industry generates revenues in excess of \$150 billion a year. Further, consumers use their mobile devices for more than phone calls and text messages; devices are increasingly becoming a primary link to the Internet. As consumer reliance on mobile devices for Internet access (e.g., for e-mail and maps) grows, so does the need for wireless data service. Indeed, the Federal Communications Commission's (FCC) National Broadband Plan² noted that "mobile broadband is the next great challenge and opportunity for the United States" and identified a goal of making the United States the world leader "in mobile innovation, with the fastest and most extensive wireless networks of any nation."³

Members of Congress and public interest groups have raised concerns about the competitiveness of the wireless industry in recent years. Consolidation through mergers and acquisitions has created a market for wireless services in which four companies—AT&T Inc. (AT&T), Sprint Nextel (Sprint), T-Mobile USA Inc. (T-Mobile), and Verizon Wireless (Verizon)—have the vast majority of subscribers. Such consolidation has

¹For the purposes of this report, the term "wireless phone service" includes the provision of such service by cellular, broadband personal communications service, and digital specialized mobile radio carriers. Federal law and FCC regulations refer to wireless phone service as "commercial mobile service" or "commercial mobile radio service." This service may generally be referred to as wireless phone service, mobile phone service, or cellular (or cell) phone service interchangeably.

²FCC, *Connecting America: The National Broadband Plan* (Washington, D.C., March 2010).

³For the purposes of this report, "broadband" refers to advanced communications systems capable of providing high-speed transmission of services such as data, voice, and video over the Internet and other networks. Transmission is provided by a wide range of technologies, including digital subscriber line and fiber optic cable, coaxial cable, wireless technology, and satellite. Broadband platforms make possible the convergence of voice, video, and data services onto a single network.

created concerns that there may be a lack of competitiveness, which could lead to deteriorating service and higher prices for consumers. Under federal law, FCC is responsible for fostering a competitive wireless marketplace while ensuring that consumers are protected from harmful practices. FCC has generally taken a deregulatory approach to the wireless industry in order to foster competition and innovation, though it monitors the industry through its annual report on wireless competition. The Department of Justice Antitrust Division, along with FCC, reviews and approves wireless industry mergers and acquisitions.

In November 2009, we reported on the need for FCC to improve its oversight of wireless phone service quality and consumer issues.⁴ In response to your request, this report examines other changes and issues in the wireless industry and whether there are additional actions FCC could take to ensure effective competition. In particular, this report discusses (1) the ways in which the wireless industry has changed since 2000 and the implications of those changes on competition and consumers, (2) stakeholders' perceptions of the effect of various regulatory policies and industry practices on the wireless industry and consumers, and (3) the strategies FCC has employed to monitor and oversee competition in the wireless industry.

To determine the ways in which the industry has changed since 2000, we identified and analyzed quantitative data—such as the number of wireless subscribers and prices—from UBS Investment Research (a financial services firm); FCC; the Bureau of Labor Statistics; as well as survey data collected by CTIA, an industry association; and data from a commercial database. The metrics we used in this report are those that are commonly used to discuss the state of competition in the wireless telephone industry recommended by a variety of stakeholders with whom we spoke. Due to the proprietary nature of some information, we were limited in the data we could collect, which limited our ability to analyze competition in various segments of the wireless industry. To complement these data, we examined public comments submitted in response to FCC's August 2009

⁴GAO, *Telecommunications: FCC Needs to Improve Oversight of Wireless Phone Service*, [GAO-10-34](#) (Washington, D.C.: Nov. 10, 2009). In this report, we recommended that FCC improve its outreach to consumers about its complaint process, related performance goals and measures, and monitoring of complaints. We also recommended FCC develop policies for communicating with states and develop guidance on federal and state oversight roles, seeking statutory authority from Congress if needed. FCC noted actions that began to address most of the recommendations.

Notice of Inquiry on its annual mobile wireless competition report. To determine the implications for consumers and competition, as well as stakeholders' perceptions of the effect of various industry practices and regulatory policies, we spoke with a variety of stakeholders in order to gain a broad perspective on the issues; these stakeholders included all of the 4 large national carriers, 11 regional and small carriers, 4 device manufacturers and network operators, 3 tower companies, 7 industry associations, 6 consumer groups, 8 academic and industry experts, and numerous local and state officials as part of our case studies. We conducted case studies in both urban and rural cellular market areas in four states, as well as the District of Columbia,⁵ speaking with local government officials, telecommunications and economic development experts, and wireless companies. We selected the case study sites based on population, the number of competing carriers, the number of wireless carriers receiving Universal Service Fund (USF) High-Cost program subsidies,⁶ and suggestions from experts. The case studies serve as illustrative examples; they are a nonprobability sample and, therefore, cannot be generalized to all cellular market areas. To determine the strategies employed to oversee and monitor competition, we spoke with a variety of FCC officials as well as the Department of Justice Antitrust Division about their specific roles in the oversight of competition in the wireless industry. We also reviewed FCC reports, orders, and merger documentation related to the wireless industry. We also spoke with stakeholders about the impact of FCC's current strategies to oversee and monitor competition in the industry.

We conducted this performance audit from August 2009 to July 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence

⁵These states were California, Iowa, Minnesota, and West Virginia. For more information on the specific markets, see appendix I.

⁶The USF was designed to ensure that all Americans have access to affordable telecommunications services. All telecommunications carriers, and other entities providing interstate telecommunications services, are required to contribute to federal universal service, unless exempted by FCC. 47 U.S.C. §254. The USF is subdivided into four programs, including the High-Cost program, which provides financial support to carriers operating in high-cost—generally rural—areas in order to offset their costs, thereby allowing these carriers to provide rates and services that are comparable to the rates and services that customers in low-cost—generally urban—areas receive.

obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Appendix I provides a detailed discussion of our scope and methodology.

Background

Components of a Mobile Phone System. Mobile phones are low-powered radio transceivers (a combination radio transmitter and receiver) that use radio waves (spectrum)⁷ to communicate with base stations. These include traditional voice-only cellular phones, as well as “smart” phones that generally have large viewscreens, along with enhanced data and messaging capabilities. Wireless phone service carriers deliver mobile phone service by subdividing large geographic areas into smaller overlapping sections called cells. Each cell has a base station equipped with an antenna to receive and transmit radio signals to mobile phones within its coverage area. This area can vary in size from under a mile to 20 miles from the base station. A mobile phone’s communications are generally associated with the base station of the cell in which it is presently located.

When a call is initiated, the base station assigns a radio frequency to the mobile phone from among the group of frequencies that the station controls. The number of frequencies available at a base station will depend primarily on the amount of radio frequency spectrum obtained by the carrier from FCC, the number of base stations in the carrier’s service area, and the type of technology that the carrier uses.⁸ Each base station is linked to a mobile phone switching office, which is also connected to the local wireline telephone network. As a result, the majority of wireless traffic actually flows over the wireline telephone system, with only the last segment—traveling to and from mobile phones to towers—operating wirelessly. The mobile phone switching office directs calls to the desired locations, whether to another mobile phone or a traditional wireline telephone. This office is responsible for switching calls from one cell to another in a smooth and seamless manner as consumers change locations during a call. Special access services are used to provide backhaul, the

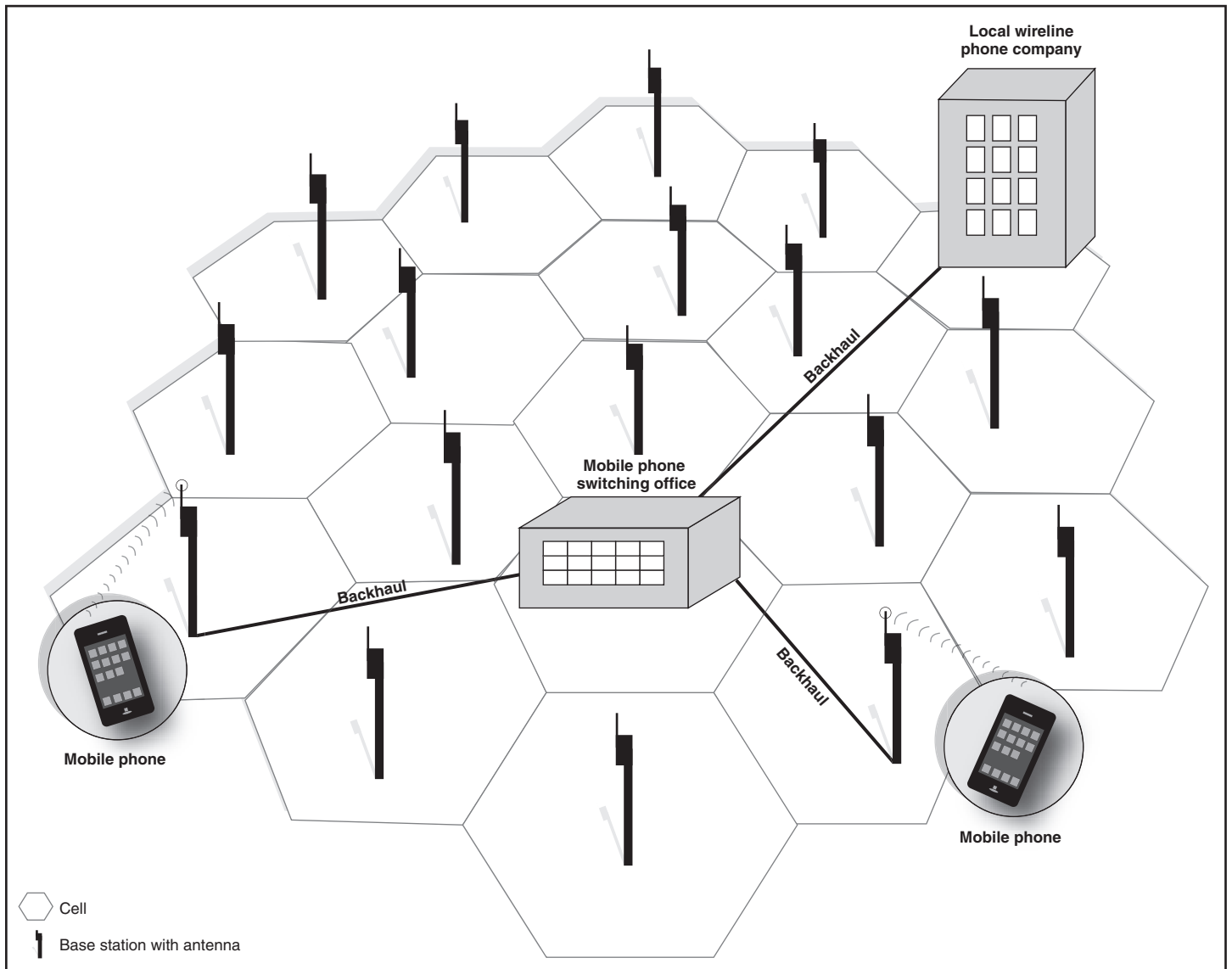
⁷Electromagnetic spectrum is the medium that enables wireless communications of all kinds, including mobile phone and paging services, radio and television broadcasting, radar, and satellite-based services.

⁸In the United States there are two main technological standards used for wireless telephony: Global System for Mobile Communication (GSM) and Code-Division Multiple Access (CDMA). They are technical interface systems used for routing calls through the wireless network.

wireline infrastructure that, among other things, connects cell phone towers to switching stations and, ultimately, to other phones.⁹ Special access services employ dedicated facilities that run directly from cell phone towers to wireline networks. Figure 1 illustrates the components of a mobile phone system.

⁹Special access services are dedicated, point-to-point, high capacity transmission services provided by Incumbent Local Exchange Carriers (ILEC), which are subject to FCC regulation. While special access circuits leased from ILECs are the most common method of accessing backhaul, wireless carriers also use other methods to connect their wireless infrastructure to the telephone network, such as wireless backhaul (e.g., microwave antennas).

Figure 1: Key Components of a Mobile Phone System



Source: GAO.

Wireless Industry Background. In the wireless phone industry, four large national wireless phone service carriers—AT&T, Sprint, T-Mobile, and Verizon—currently operate alongside small and regional carriers of

various sizes.¹⁰ The four large, national carriers serve more than 90 percent of wireless subscribers, though no single competitor has more than one-third of the market share of the national market. According to industry data, currently more than 140 companies offer wireless services. Many carriers, such as AT&T and Verizon, are considered “facilities-based” in that they both own and operate elements of their wireless network. In addition to these facilities-based carriers, the wireless industry includes mobile virtual network operators (MVNO), such as TracFone. While many wireless carriers acquire spectrum licenses from FCC, MVNOs are resellers of wireless services; they do not hold spectrum licenses, but lease network space wholesale from other providers. According to FCC, there are currently at least 60 MVNOs in the United States.

To subscribe to wireless phone service, a consumer must select a wireless phone service carrier and either sign a contract and choose a service plan or purchase prepaid minutes and buy a phone that works with the prepaid service. Most consumers sign contracts that specify the service plan, the number of voice minutes, and the number of text messages the consumer is buying for a monthly fee; consumers can also purchase data plans which allow them to access the Internet for a monthly fee. New consumers who sign contracts for wireless phone service sometimes pay upfront fees for “network activation” of their phones and usually agree to pay an “early termination fee” (ETF) if they should quit the carrier’s network before the end of the contract period. In return for signing a contract, consumers often receive wireless phones at a discount or at no additional cost. Some carriers also permit consumers to purchase their own handsets without requiring that they enter into long-term contracts. While there are a variety of handsets consumers can purchase, some are exclusively linked to one carrier.

Regulatory History. When establishing the rules for cellular service in 1981, the commission decided that it would only grant two licenses to carriers in each cellular market to build facilities and offer cellular telephone service. One license was reserved for the existing local telephone company and the other was initially reserved for applicants that

¹⁰Throughout this report, we refer to AT&T, Sprint, T-Mobile, and Verizon as the “large national carriers.” We refer to AT&T and Verizon as the “top national carriers.” Small and regional carriers include all carriers outside the large, national carriers, such as Cellular South, nTelos, and U.S. Cellular.

were not affiliated with any wireline telephone carrier.¹¹ The commission relied on comparative hearings and lotteries to assign these licenses to new carriers. However, in our 1992 report, we noted that this market structure provided only limited competition. We recommended that FCC consider establishing a policy that supports new entrants into the wireless market by giving first preference to firms not offering cellular telephone service when allocating spectrum.¹² Later, when the FCC allocated more spectrum, it opened the wireless market to more carriers.

In the 1990s, Congress enacted two laws—the Omnibus Budget Reconciliation Act of 1993 (1993 Act)¹³ and the Telecommunications Act of 1996 (1996 Act)¹⁴—that sought to increase competition among carriers through a deregulatory framework. The 1993 Act preempted state and local governments from regulating the entry of or the rates charged by commercial mobile service carriers.¹⁵ In addition, the 1993 Act gave FCC authority to set up spectrum auctions for the distribution of licenses, replacing the lottery system. The purpose of the auction system was to award licenses to those who would use them most efficiently. The 1993 Act also required FCC to provide annual mobile wireless competition reports to Congress. In the 1996 Act, a law that deregulated various aspects of the telecommunications industry, the Congress provided FCC with additional tools that could be used to promote competition in the mobile phone service industry. In order to enhance competition, the 1996 Act authorized FCC to exempt telecommunications carriers, including wireless carriers, from any requirements that are not necessary to protect consumers, ensure that service provided be just and reasonable, and not unjustly or unreasonably discriminatory.¹⁶ The 1996 Act also required that every 2 years FCC engage in a review of its rules, including those related

¹¹*Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communication Systems*, Report and Order, 86 FCC 2d 469 (1981).

¹²GAO, *Telecommunications: Concerns About Competition in the Cellular Telephone Industry*, GAO/RCED-92-220 (Washington, D.C.: July 1, 1992).

¹³Pub. L. No. 103-66, 107 Stat. 312 (1993).

¹⁴Pub. L. No. 104-104, 110 Stat. 56 (1996).

¹⁵47 U.S.C. §332(c)(3).

¹⁶47 U.S.C. §160.

to mobile phone service, to determine whether any of them are no longer necessary as a result of meaningful competition among carriers.¹⁷

Ahead of the first spectrum auctions, FCC decided to introduce caps on the amount of spectrum any one carrier could hold in a market (spectrum cap) to ensure that a number of carriers would be able to compete in a given market and that no one carrier would thereby gain dominant market share.¹⁸ In 2001, the Commission decided to end the practice of spectrum caps—phasing it out completely in 2003—in part, because it believed there was general competition in the marketplace and that a case-by-case approach to proposed transactions could protect competition while also enabling greater economic efficiencies, which would benefit consumers.¹⁹ Instead, the FCC began a practice of applying, on a market-by-market basis, a two-part “screen”—examining (1) market concentration and (2) the input market for spectrum—to determine whether a particular proposed transaction required more in-depth, case-by-case review to assure that no competitive harm would result (or to require divestitures where necessary).

The 1993 and 1996 Acts led to other FCC actions as well. FCC has traditionally regulated the rate ILECs can charge for special access services. In 1991, FCC moved the Bell Operating Companies and GTE from rate-of-return regulation to price-cap regulation and gave other ILECs the option of moving to price-cap regulation.²⁰ As noted earlier, wireless carriers are one consumer of such special access services. These services are generally provided by incumbent telecommunications companies, which can be large, multistate firms (e.g., AT&T, Qwest Communications, and Verizon). These incumbent firms have an essentially ubiquitous local network that generally reaches all of the business locations in their local areas. Because the 1996 Act encouraged a deregulatory approach to telecommunications, the commission implemented the Pricing Flexibility Order in 1999, which permitted the deregulation of special access rates in metropolitan areas where local firms could show that certain “competitive

¹⁷47 U.S.C. §161.

¹⁸47 C.F.R. §20.6 (1994). 59 Fed. Reg. 59953, Nov. 21, 1994.

¹⁹2000 *Biennial Regulatory Review Spectrum Aggregation Limits for Commercial Mobile Radio Services*, Report and Order, 16 FCC Rcd 22668 (2001).

²⁰*Policy and Rules Concerning Rates for Dominant Carriers*, Second Report and Order, 5 FCC Rcd 6786, 6818-20 (1990).

triggers” had been met and that there was competition for special access services.²¹ FCC granting either partial- or full-pricing flexibility to the price-cap incumbent carriers depends on the extent of competitive co-location of special access facilities in a particular metropolitan area.

Since 2000, the Wireless Industry Has Consolidated and Usage Has Increased, Creating Challenges for Small and Regional Wireless Carriers and Some Benefits for Consumers

A number of quantitative metrics demonstrate the evolution of the wireless industry.²² Data show that the biggest changes since 2000 have been consolidation among wireless carriers and increased use of wireless services by consumers. Industry consolidation has created some challenges for small and regional carriers to remain competitive; these challenges include securing subscribers, making network investments, and accessing handsets. While the industry has consolidated since 2000, consumers have seen some benefits, such as lower prices and better coverage.

Data Indicate that the Primary Changes in the Wireless Industry are Consolidation of Carriers and Increased Use of Wireless Services by Consumers

Consolidation of Carriers. The primary change in the wireless industry since 2000 has been the consolidation of wireless carriers. The Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration used by both the Department of Justice Antitrust Division and FCC. The average HHI score for the wireless industry, as calculated by FCC, has increased by over 30 percent since first reported by FCC in 2004.²³ This suggests that the market shares of the largest national carriers generally have increased. In addition to changes in market shares, there

²¹*Access Charge Reform*, Fifth Report and Order and Further Notice of Proposed Rulemaking, 14 FCC Rcd 14221 (1999) (*Pricing Flexibility Order*).

²²The metrics used in this section to discuss changes in the industry, such as market share, penetration rate, and churn rate, are commonly used to discuss the state of competition in the wireless telephone industry. Measures of these changes were recommended by a variety of stakeholders with whom we spoke. While some stakeholders also recommended other indicators, such as profit, we did not include those here because we were limited by the information to which we had access.

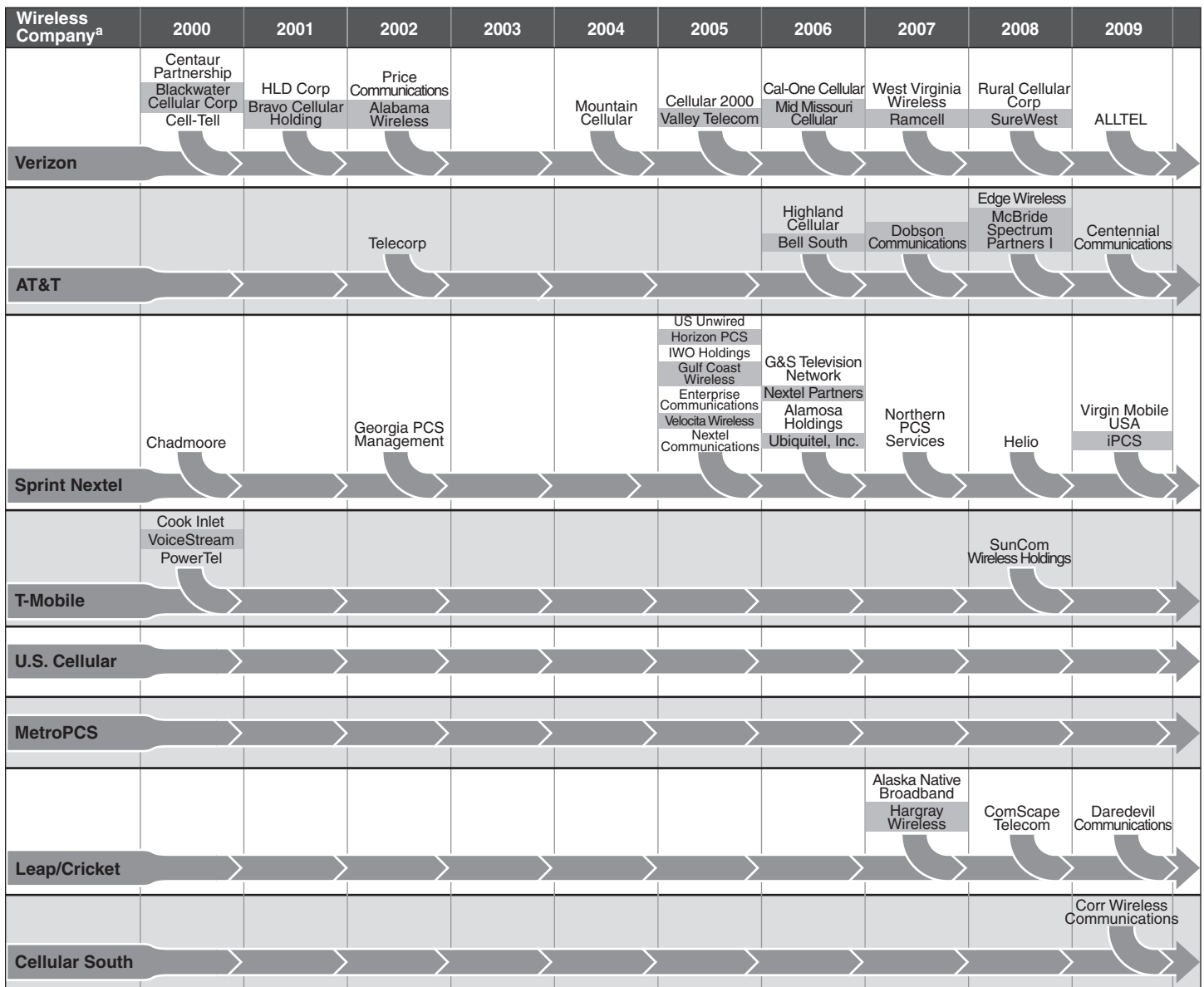
²³Based on FCC data as of December 2003, the average value of the HHIs weighted by Economic Area population was 2151. The HHI in 2008, the latest figure available, was 2848.

are other factors that could explain changes in the HHI score, including a decrease in the number of carriers through mergers or other exits from the market.

Over the past 10 years, consolidation in the wireless industry has generally been accomplished through a series of mergers and acquisitions. Figure 2 illustrates the major mergers and acquisitions among some of the major wireless carriers since 2000. The major transactions that have helped create the four large national carriers are Cingular's acquisition of AT&T in 2004,²⁴ Sprint's acquisition of Nextel in 2005, AT&T's acquisition of Dobson in 2007, T-Mobile's acquisition of SunCom in 2008, Verizon's acquisition of ALLTEL in 2008, and AT&T's acquisition of Centennial Communications Corporation (Centennial) in 2009. Many of the other transactions since 2000 have been larger carriers acquiring smaller competitors. As a result, the market share of the large national carriers has generally increased, as illustrated in figure 3. Indeed, one stakeholder mentioned that while he has worked with several local cellular companies in the past, most of them have now been bought by large, national carriers. In West Virginia, according to state officials with whom we spoke, 90 percent of the wireless market is held by five carriers, but of that, 44 percent is held by one national carrier. In some cases, mergers have resulted in only one carrier with extensive coverage in a particular market. In Northwest Minnesota, according to some stakeholders with whom we spoke, Verizon Wireless became the only carrier available to most of the population after its purchase of the Rural Cellular Corporation, although other carriers hold spectrum licenses. Nevertheless, national figures can sometimes mask the regional strength of some smaller carriers, according to one carrier with whom we spoke. U.S. Cellular, for example, has a relatively large market share in some Midwest markets.

²⁴Cingular's mobile phone service was marketed under the AT&T brand beginning in 2005.

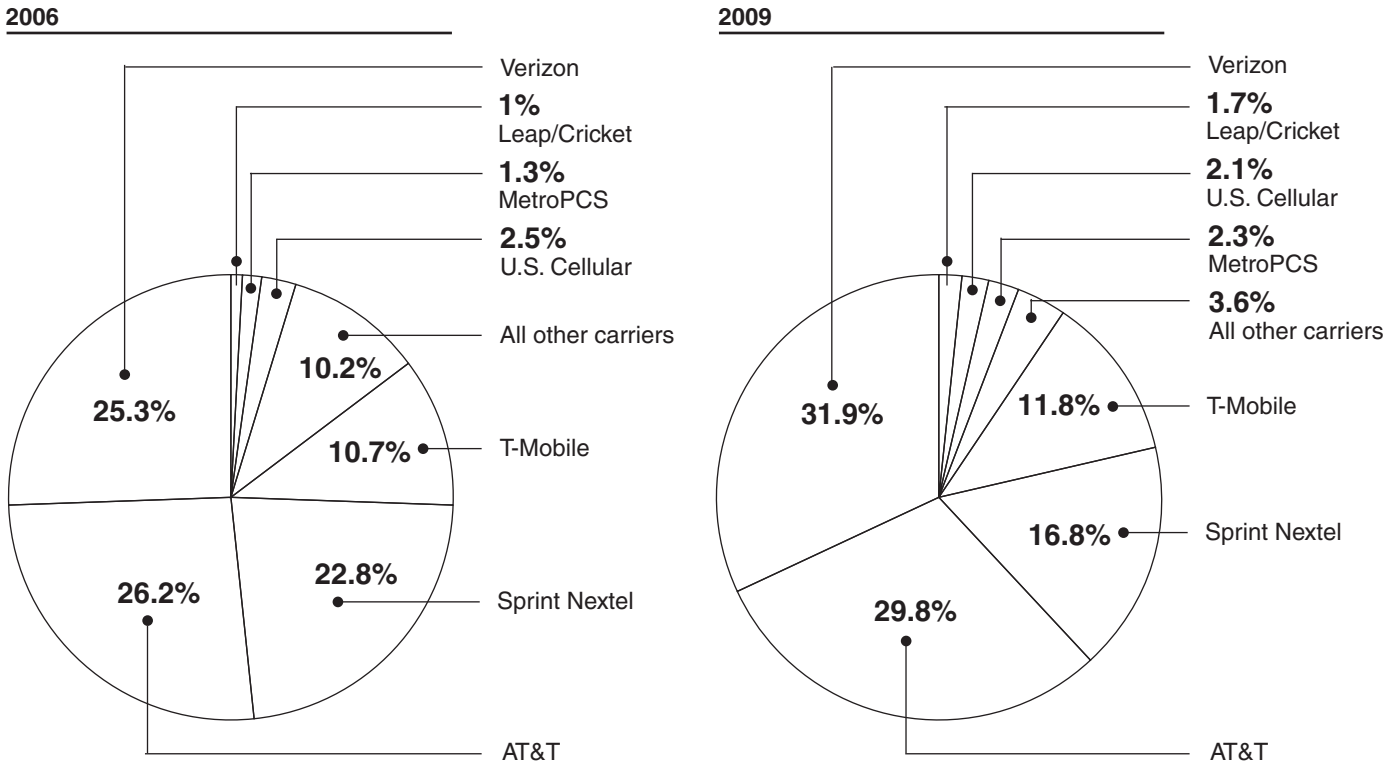
Figure 2: Mergers of Select Wireless Carriers, 2000-2009



Source: GAO analysis of SNL Kagan data.

^aThese are the wireless carrier names as of May 2010. This graphic does not reflect the mergers of companies prior to their acquisition by the eight existing carriers identified here. For example, prior to its merger with Verizon in 2009, ALLTEL acquired Midwest Wireless (2005), Western Wireless (2005), Cellular One of Amarillo (2006), and First Cellular of Southern Illinois (2006), among other transactions.

Figure 3: Wireless Subscriber Market Share



Source: GAO analysis of SNL Kagan data.

In addition to mergers, the acquisition of spectrum licenses through spectrum auctions and license transfers has allowed large national carriers to get bigger. License transfers can happen when carriers resell their licenses or portions of their licenses to other carriers. For instance, AT&T currently owns five licenses in the Minneapolis-St. Paul, Minnesota, market, two of which it initially won in auctions and three of which it acquired through other transactions.²⁵ Such transactions can facilitate the growth of carriers by allowing them to construct and operate larger networks, thereby supporting more subscribers and market share. License transfers can also happen in order to secure merger approval from the Department of Justice (DOJ) and FCC. For example, before merging in 2008, Verizon and ALLTEL were required by FCC to divest their assets in 5

²⁵One of these licenses was an original cellular license that was obtained by AT&T, while two were acquired through secondary market transactions.

markets and in another 100 markets by DOJ, based on the conclusion that the merger would decrease the level of competition in those markets. MetroPCS, nTelos, and a number of other small and rural carriers filed Petitions to Deny the license divestiture procedures, urging FCC to take steps to ensure that small and rural carriers and new entrants had opportunities to gain the divested spectrum licenses. FCC denied all petitions to set conditions on license transfers stating that applications for license transfers were required to be individually reviewed, decreasing the potential for competitive harm.²⁶ DOJ further stated that the carrier that purchased the license needed to be an “effective competitor.” However, some stakeholders referred to the results of such divestitures as “spectrum swapping,” with licenses simply being transferred from one large carrier to another. Since the 2008 divestiture of Verizon and ALLTEL spectrum assets, many of the licenses are being transferred to a subsidiary of AT&T.

Increased Use of Wireless Services by Consumers. Since 2000, the number of wireless consumers has increased significantly. One measure of consumer use is the wireless “penetration rate,” generally defined as the number of wireless subscribers as a percentage of the total U.S. population. Based on industry data, the penetration rate, as of December 2009, was 91 percent.²⁷ As figure 4 shows, the wireless penetration rate was only 38 percent in 2000, showing that wireless use has grown significantly in the past decade. Furthermore, the percentage of households that are wireless-only has been steadily increasing. The number of adults living in households with only wireless telephone service has increased from less than 5 percent in 2003 to nearly 23 percent in 2009. According to one study of wireless use, wireless connections in California now exceed the combined connections of both wireline and broadband services.²⁸ Our data also show that, as the penetration of wireless services

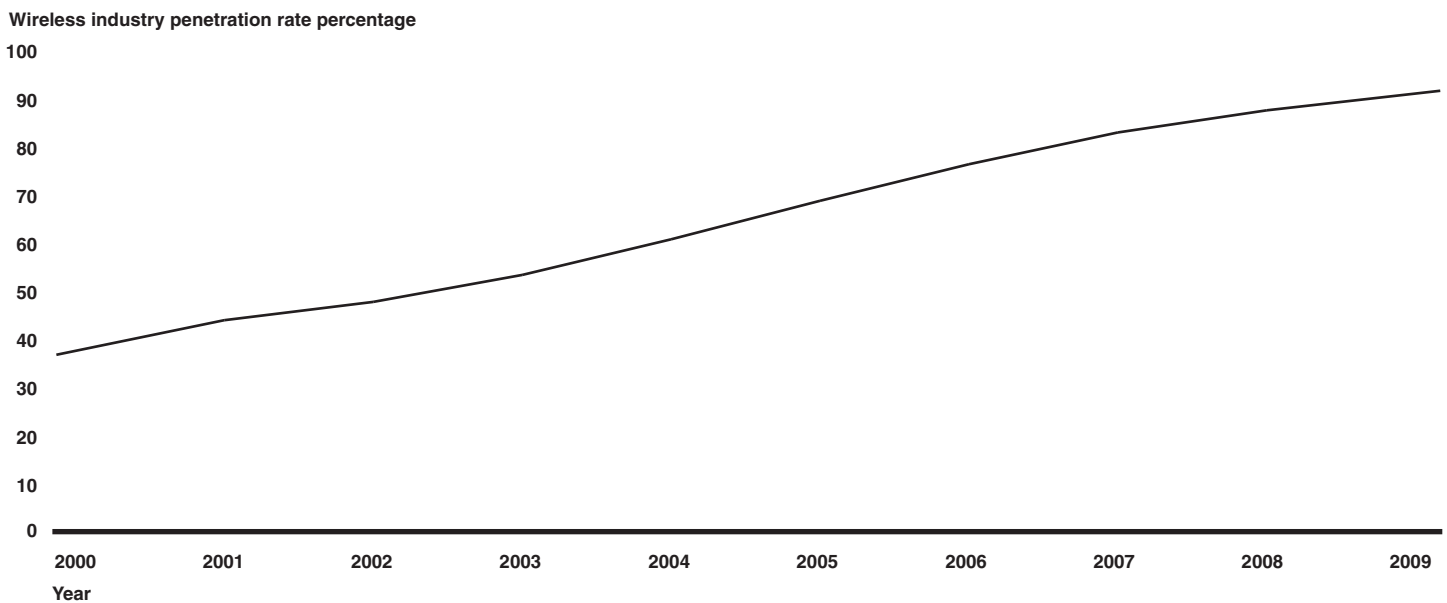
²⁶*Applications of Cellco Partnership d/b/a Verizon Wireless and Atlantis Holdings LLC For Consent to Transfer Control of Licenses, Authorizations, and Spectrum Manager and De Facto Transfer Leasing Arrangements and Petition for Declaratory Ruling that the Transaction is Consistent with Section 310(b)(4) of the Communications Act*, Memorandum Opinion and Order and Declaratory Ruling, 23 FCC Rcd 17444 (2008).

²⁷The total U.S. telephone penetration rate, including cell phones and wireline phones, was about 96 percent in 2009 (FCC, *Telephone Subscriberhip in the United States*, Industry Analysis and Technology Division, Wireline Competition Bureau, February 2010). It is possible for the wireless penetration rate to exceed 100 percent, given that some individuals have multiple devices.

²⁸California Public Utilities Commission, Communications Division – Policy Branch, *Market Share Analysis of Residential Voice Communications in California*, Staff White Paper (San Francisco, Calif., December 2008).

has grown over the past few years, the growth in the number of new wireless subscribers has slowed. As a result, carriers are now mainly competing for existing subscribers because there are few potential new subscribers available.

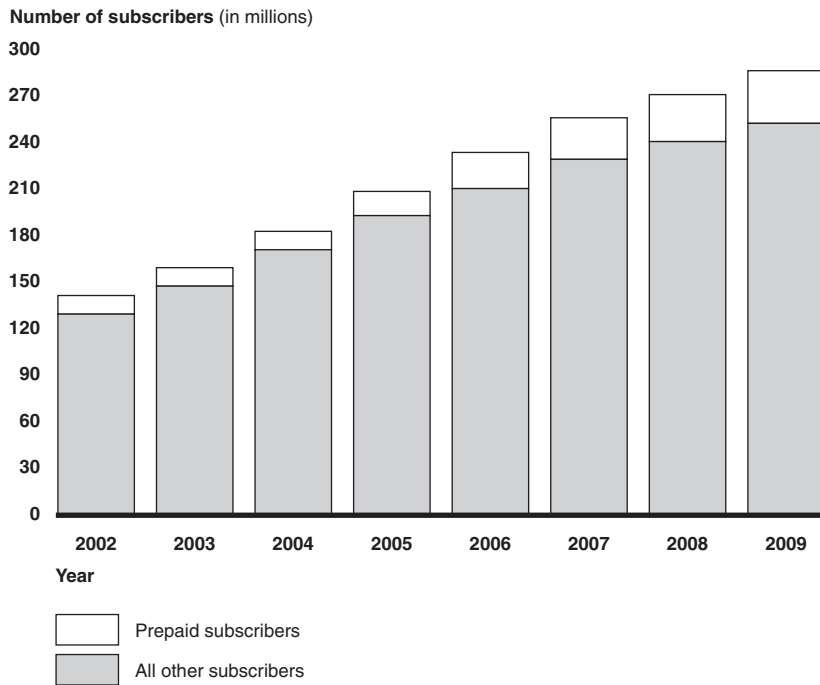
Figure 4: Estimated Wireless Penetration Rate



Source: CTIA-The Wireless Association, used with permission.

The number of wireless subscribers who use prepaid services has increased. In the wireless market, it is possible for consumers to purchase services with a contract (postpaid subscribers) or without, simply purchasing services month-to-month (prepaid). The number of prepaid subscribers, as a portion of all wireless subscribers, has grown in the past five years (see figure 5). New prepaid cell phone subscribers accounted for nearly two-thirds of the 4.2 million net subscribers added by U.S. phone carriers in the fourth quarter of 2009. According to some analysts, this recent trend has been driven by a desire for flexibility on the part of consumers as well as economic issues. This increase in prepaid subscribers has taken some subscribers away from the large, national carriers that have traditionally relied on postpaid subscribers, according to industry analysts with whom we spoke. The four largest national carriers are now present in the prepaid market, as well as the postpaid market.

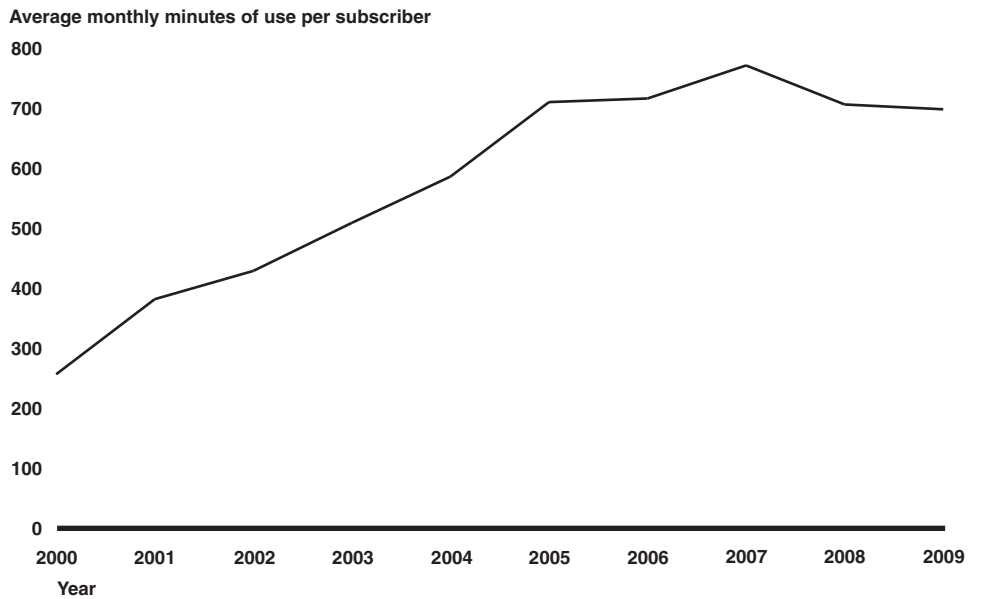
Figure 5: Estimated Wireless Phone Subscribers



Source: SNL Kagan and UBS Investment Research, *US Wireless 411* (March 2010).

The increase and change in the use of wireless services by consumers is evidenced not only by a change in the number of subscribers, but also the changes in the average use of voice minutes and use of data services. While average voice minutes used has decreased recently, data usage is increasing, both in the number of users of data services and the amount being used. From 2000 until 2007, the average number of voice minutes used per month increased from approximately 250 minutes to over 750 minutes. In recent years, though, voice minutes have decreased slightly (see figure 6). On the other hand, data use, including text messaging, as well as accessing the Internet, has been increasing. For instance, there were over 152 billion text messages sent in December 2009, compared to over 110 billion messages in the month of December 2008. This shift to a datacentric market has been driven, in part, by the increase in the number and popularity of smart phones.

Figure 6: Estimated Wireless Voice Minutes of Use



Source: CTIA-The Wireless Association, used with permission.

Industry Consolidation Has Made it More Difficult for Small and Regional Carriers to be Competitive

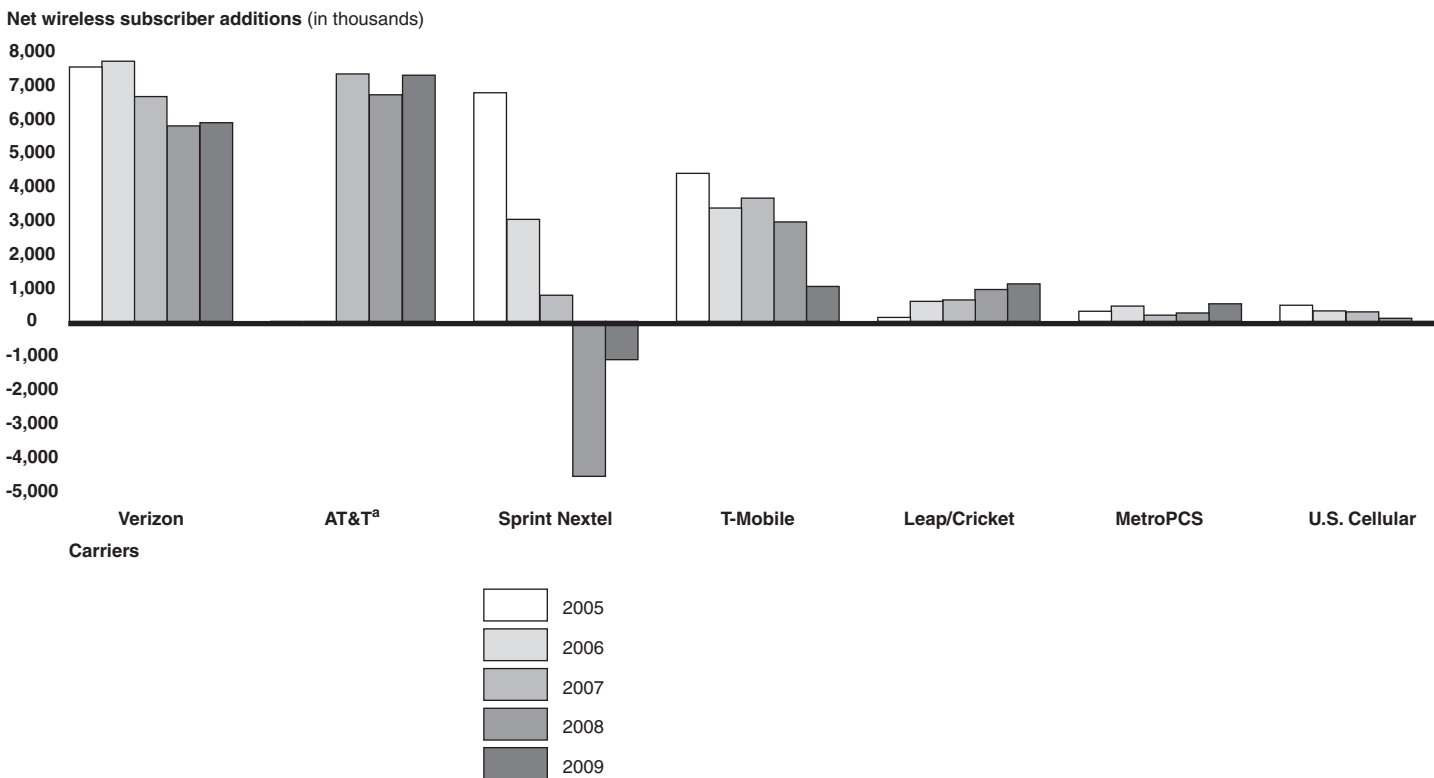
Through their growing share of the overall wireless market, large national wireless carriers have been able to exploit significant economies of scale. While these economies of scale can facilitate the continued growth of the top carriers, they can also create challenges to the growth and competitiveness of small and regional carriers. In particular, small and regional carriers, as well as other stakeholders, noted their difficulties in securing subscribers, network investments such as chipsets, and handsets.²⁹

Subscribers. Due in part to the consolidation of carriers and spectrum, the top national carriers have increasingly dominated the acquisition of subscribers. One metric of competition is net adds, or the change in the number of subscribers a carrier has within a specific period, which takes subscriber turnover into consideration. Figure 7 illustrates the net adds, by carrier, since 2005. These data show that over the past 4 years, net subscriber additions have primarily and consistently accrued to the top national carriers. Data from the second quarter of 2009 alone show that

²⁹When a wireless signal reaches a handset, it passes through a “chipset” (i.e., a set of microchips) where it is electronically processed and presented to the subscriber as a sound signal.

the top national carriers accrued about four times the number of net adds as the next carrier. Indeed, some stakeholders stated that a reason for the high number of net adds is because the large national carriers have exclusive handsets and consumers are choosing those carriers because of their offerings. Without net adds, small and regional carriers can face challenges securing investments because non-negative net adds are indicative of a steady revenue source.

Figure 7: Net Subscriber Additions by Carrier



Source: SNL Kagan.

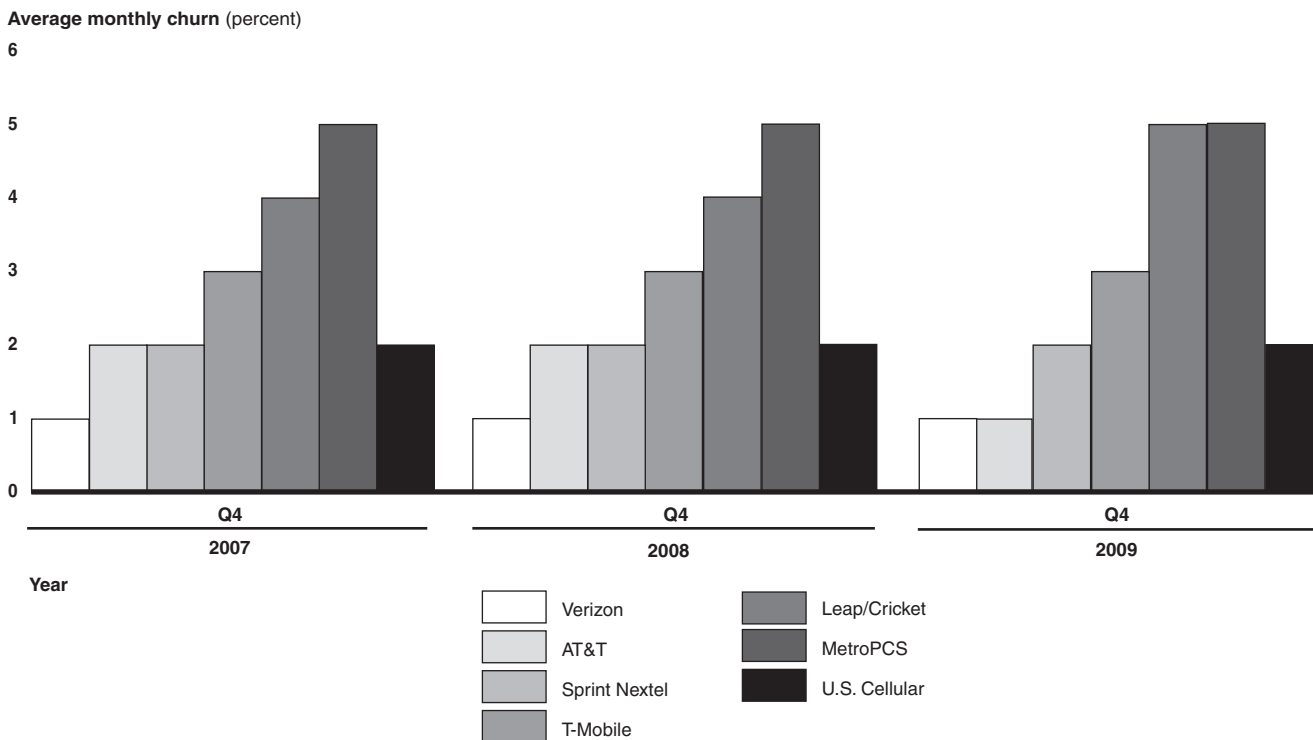
Note: These figures do not include subscriber additions that resulted from mergers and acquisitions.

^aData for AT&T are unavailable prior to 2007.

The trend in subscriber turnover, though incorporated into net subscriber additions, on its own also indicates that subscribers are mostly accruing to the top national carriers. Subscriber turnover is most commonly measured as the churn rate, which is the number of subscribers disconnecting from service during a given period as a percentage of the average total number of subscribers for a carrier. As the penetration rate moves past 90 percent,

there are fewer new consumers to gain. The difficulty for small and regional carriers is retaining the subscribers that they have. As figure 8 indicates, the top two national carriers have generally had lower average monthly churn rates than the next two national carriers, as well as small and regional carriers. While a low churn rate could be due to a number of different factors, these data indicate that over the past three years, small and regional carriers as well as some national carriers have had difficulty retaining subscribers.

Figure 8: Wireless Subscriber Churn



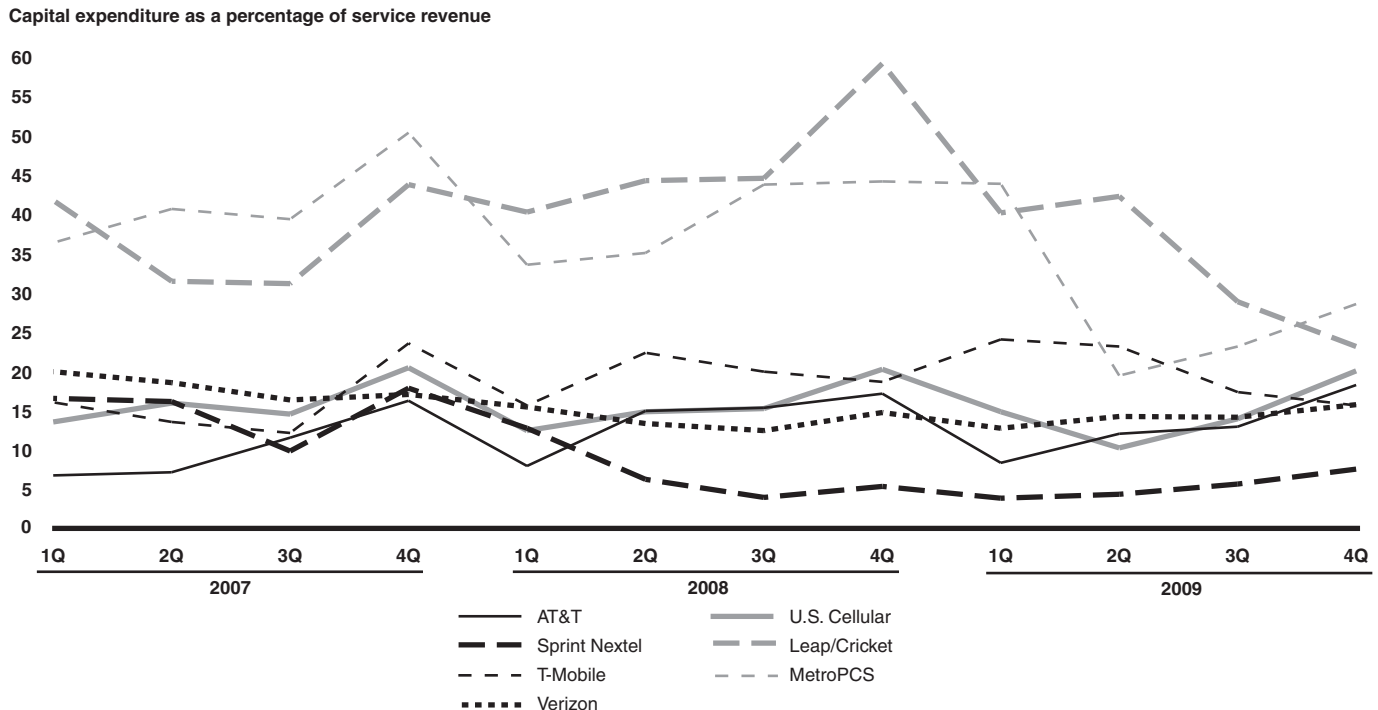
Source: SNL Kagan and UBS Investment Research, *US Wireless 411* (March 2010).

Network Investments. The size and scale of large national carriers gives them the advantage of being able to deploy faster networks ahead of their competitors, thus reinforcing their competitive advantage. Developing and expanding networks require significant capital investment. Without pressure to keep their networks and, therefore, their services competitive, carriers may not be willing to undertake this investment. Therefore, capital expenditure is one way to measure the level of competition in a given market. We encountered divergent views on the extent of investment

being made by wireless carriers. While some stakeholders maintained that their investment in wireless networks remains a significant portion of their costs, others pointed to data showing that some wireless carriers do not appear to be investing aggressively, based on capital expenditures as a percentage of revenue. According to some industry analysts, carriers generally continue to invest significant capital in networks, despite the recent economic downturn. In the past 3 years, large national carriers have been able to invest more money in their networks than other carriers. AT&T and Verizon, for example, both spent over \$2 billion in the fourth quarter of 2009, representing about two thirds of total industry expenditures. U.S. Cellular and Leap Wireless each spent under \$200 million in the same time frame. However, as the data in figure 9 show,³⁰ the capital investments of some large national carriers have been smaller portions of their service revenue than investments on the part of some of the smaller regional carriers. For instance, even though it spent approximately 18 times less than AT&T on total capital investments, Leap Wireless spent more as a proportion of its service revenue.

³⁰The UBS Wireless 411 Report capital expenditure figures are compiled from industry-reported data. Capital expenditure figures, therefore, include network investment, labor expenses, and capitalized interest.

Figure 9: Capital Expenditures as a Percentage of Revenue



Source: UBS Investment Research, *US Wireless 411* (March 2010).

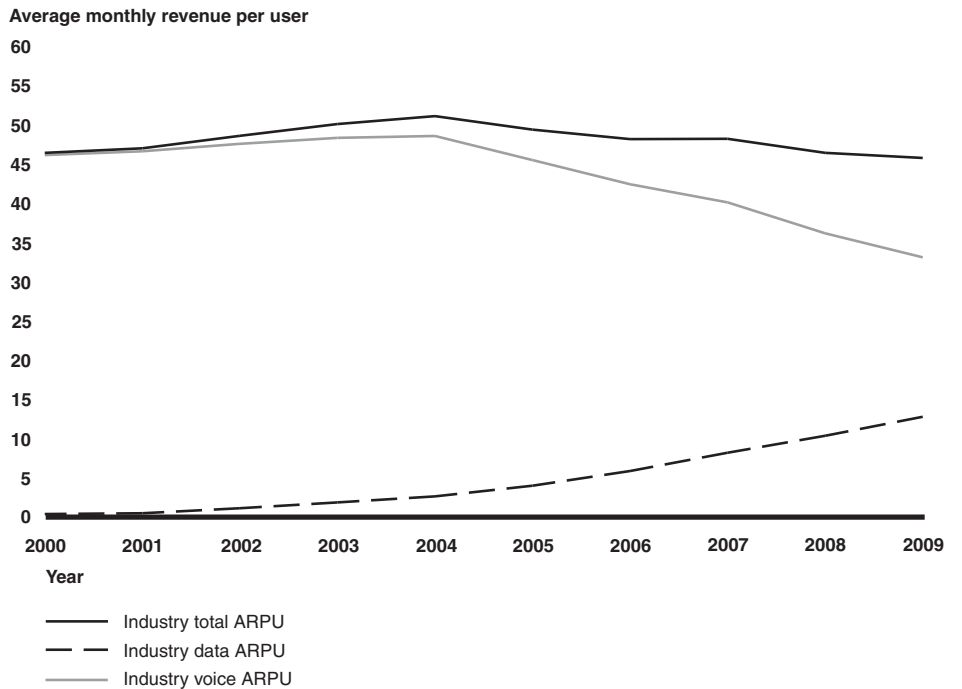
The acquisition of spectrum and access to equipment is also necessary for carriers to expand networks and develop faster networks, making the carrier a more attractive choice for consumers. As noted above, small and regional carriers generally have fewer resources to draw upon than large national carriers, making it difficult for these carriers to expand and develop their networks as quickly. For example, because of their scale, large national carriers can purchase necessary network equipment, such as chipsets, before their smaller competitors. Small and regional carriers generally do not have the number of subscribers necessary to obtain, at any price, the necessary equipment. As a result, this equipment is often only designed to utilize the large national carriers' spectrum holdings. Large national carriers, for instance, have been able to provide 3G

networks, and are poised to deploy new 4G networks, before small and regional carriers.³¹

Handsets. Advanced handsets, or “smart” phones, are a growing source of revenue for the industry. The economies of scale produced by industry consolidation have allowed the large national carriers to gain large subscriber bases, which according to stakeholders, have allowed those carriers to enter into exclusive contracts with handset manufacturers for the latest, most advanced handsets. As a result, regional carriers have not been able to take as much advantage of new data revenue streams because of their lack of access to the latest handsets, jeopardizing their competitiveness in an industry where handsets are of growing importance. Figure 10 shows the average monthly revenue for the industry overall, from voice services only, and from data services only over the course of each year. Since 2004, the industry’s Average Revenue per User (ARPU) for voice services has been in decline. In that same time period, there has been an increase in the revenue received for data services. This is true more so for the top national carriers than for small or regional carriers. Verizon and AT&T each reported data ARPU in the fourth quarter of 2009 in the mid-teens, whereas nTelos and U.S. Cellular both reported data ARPU of about \$10.

³¹3G is the third generation of wireless technology standards that allows faster speeds than previous generation standards; it allows voice, text, multimedia applications, and data services. 4G is the fourth generation technology standard; while allowing voice and data applications and services, all traffic on 4G networks (unlike its predecessors) will move through Internet-based networks—including voice.

Figure 10: Average Revenue per User



Source: SNL Kagan and UBS Investment Research, *US Wireless 411* (March 2010).

Stakeholders consistently noted that consumers are increasingly basing their wireless decisions on the availability of particular advanced handsets. According to stakeholders with whom we spoke, competition in the wireless industry, which traditionally centered on network quality and price, has shifted to handset devices, which small and regional carriers cannot access quickly. One regional carrier mentioned that though the time between when new devices are launched and their availability to small and regional carriers has shortened, by the time small carriers are able to offer the handset in their store, a newer version is usually being offered by the large national carriers. According to one stakeholder, some consumers do not consider these small and regional carriers as options because of the exclusive arrangements that large, national carriers have for these advanced handsets.

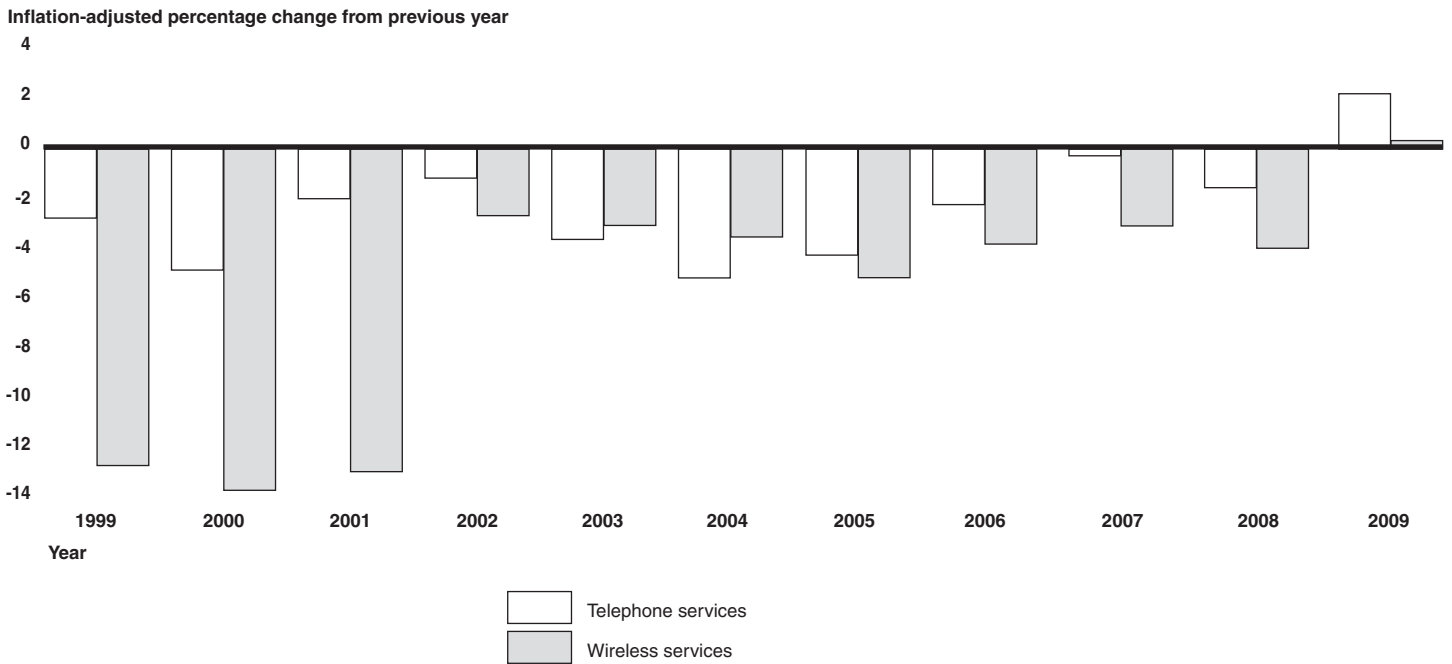
Wireless Prices have Declined Over the Last Decade and Coverage has Improved

Although consolidation has increased the difficulty for small and regional carriers to compete in the wireless industry, a high concentration of firms in an industry does not necessarily mean that the interests of consumers are poorly served.³² In particular, by enabling large national carriers to exploit economies of scale, consolidation can create greater productivity and economic efficiency. This industry consolidation may have especially improved the efficiency of the large national carriers, allowing them to offer more wireless services for similar or lower prices. Indeed, one way that wireless carriers can compete is through differentiated price plans. The Consumer Price Index, which shows the changes in the average prices of goods and services, indicates that the overall average price (adjusted for inflation) for wireless services declined each year from 1999 to 2008 (see figure 11); the average price for wireless service in 2009 was approximately 50 percent of the price in 1999. This illustrates that consumers are generally getting more wireless services (such as more voice minutes of use) for lower costs than they were 10 years ago.³³

³²As a result of a survey of adult wireless phone users, a 2009 GAO study of the quality of wireless services found that approximately 85 percent of wireless phone users are very or somewhat satisfied with their call quality. Additionally, the study estimated that 86 to 89 percent of wireless phone users are satisfied with their voice coverage when using their wireless phones at home, at work, or in their vehicle. See [GAO-10-34](#).

³³According to other industry data, the average monthly bill has remained relatively stable since 2000, not adjusting for inflation. This survey data, though, does not take into account changes in the services provided for the average bill.

Figure 11: Consumer Price Index for Telephone and Wireless Services



Source: GAO analysis of Bureau of Labor Statistics data.

A few stakeholders with whom we spoke noted that national wireless networks, which some carriers have developed through mergers and acquisitions, can provide benefits to consumers. First, they can provide smoother, more uninterrupted service. In northern Minnesota, an area with low population density, economic development officials noted that since the area has consolidated under one carrier, there have been fewer “dead spots” in the coverage. Second, national price plans have become commonplace, and all of the national wireless carriers offer unlimited voice plans. Further, according to one stakeholder, consumers have also seen a reduction in roaming fees with the advent of national networks and pricing plans.³⁴

³⁴All mobile calling plans specify a calling area—such as a particular metropolitan area, the provider’s entire network, or the entire United States—within which the subscriber can make a call without incurring additional charges. When subscribers exit this area, or “roam,” they may incur additional charges for each minute of use, each text message sent, or each time they access the Internet.

Some Stakeholders Perceive Certain Regulatory Policies and Industry Practices Jeopardizing the Competitiveness of the Wireless Industry

While views differed among stakeholders, some carriers and consumer groups perceive certain FCC wireless policies as having prevented the entry and growth of small and regional carriers, though it is difficult to assess some of these claims without better data. In particular, many stakeholders outside of the top national carriers with whom we spoke noted that spectrum and special access policies favor large national carriers, potentially jeopardizing the competitiveness of the wireless industry. Better data on special access rates, in particular, would clarify the extent to which these policies hinder competition. Additional data are also necessary to determine whether consumers are hindered from moving between wireless carriers and services by particular industry practices. Many small carriers and consumer groups with whom we spoke perceive early termination fees and exclusive handset arrangements as creating such anticompetitive switching costs. Most stakeholders also noted that local government policies and procedures for constructing infrastructure can delay the development of wireless networks.

Many Stakeholders Outside Top National Carriers Maintained that FCC Wireless Policies Have Hindered the Competitiveness of Small and Regional Carriers

Spectrum Auction Policies. As an essential input necessary for wireless services, FCC has developed a variety of mechanisms to ensure wide distribution and effective use of spectrum. FCC has auctioned spectrum licenses covering a variety of geographic areas, attached construction benchmarks to those licenses, provided auction bidding credits to certain entities, and in the past capped the amount of spectrum any one entity could hold in a region. However, many stakeholders outside of the top national carriers with whom we spoke expressed concern that, despite these FCC policies, the processes for making spectrum available for commercial use have facilitated consolidation, prevented new carriers from entering the market, and hindered the growth of small and regional carriers.

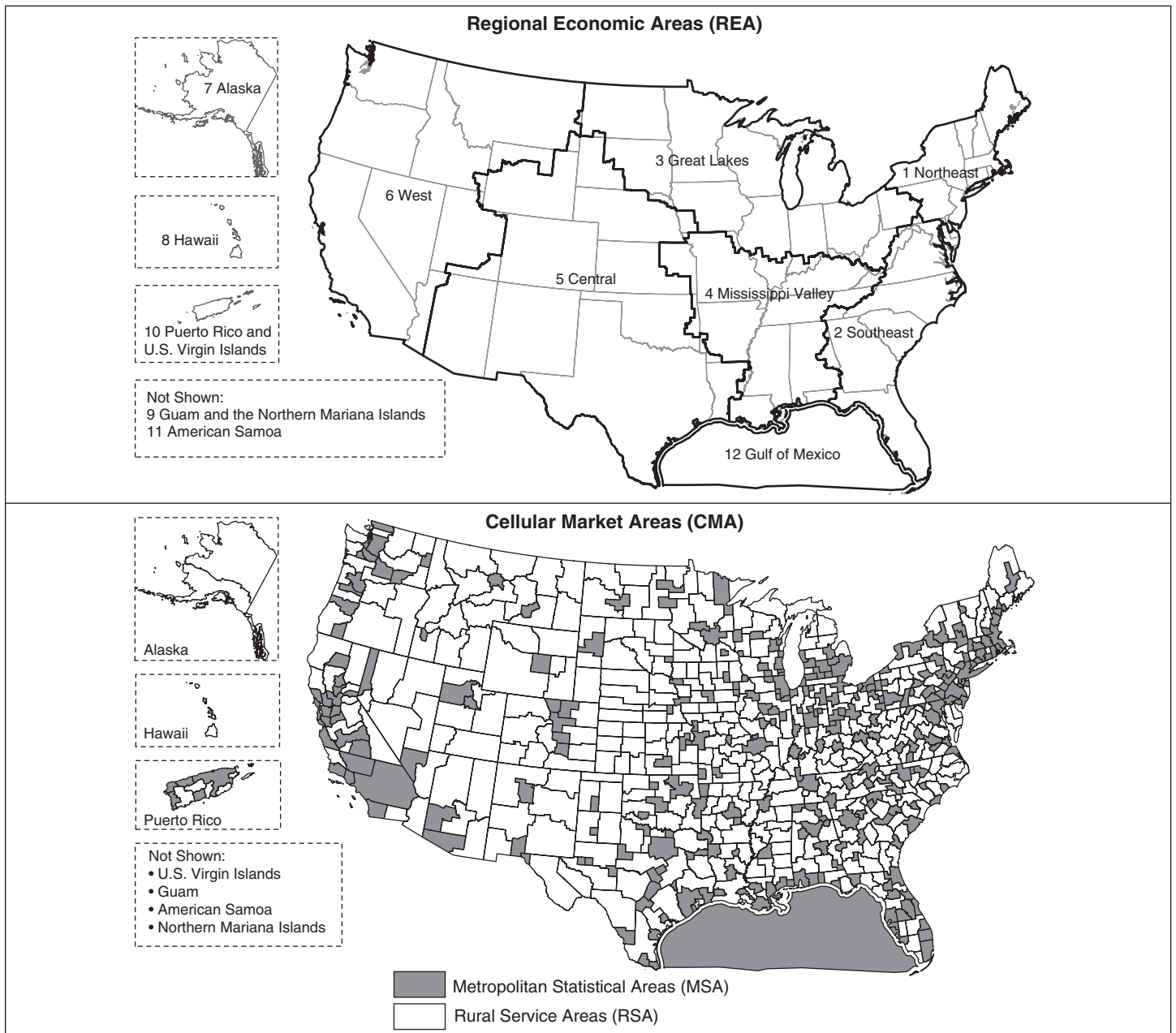
- According to some small carriers and other stakeholders with whom we spoke, the size of spectrum blocks has had the effect of pricing small and regional carriers out of recent auctions, making it difficult for these carriers to enter into new markets or expand their services. FCC auctions licenses for the exclusive use of frequencies in a variety of designated geographic regions. As figure 12 shows, there are different ways in which FCC divides the country into spectrum licenses, including relatively small multicounty areas (Cellular Market Areas) as well as large multistate

regions (Regional Economic Areas).³⁵ Though large national carriers have won a significant portion of licenses in recent auctions, it is not clear if this is because of the license sizes.³⁶ For example, in the most recent large wireless spectrum auction, Verizon and AT&T won 336 of the 1091 licenses. Though these represented 31 percent of the available licenses, they covered nearly the entire country and were viewed by stakeholders as some of the most valuable licenses available. Additionally, Verizon won all of the licenses covering Regional Economic Areas in the continental United States, despite bids from smaller entities. However, both AT&T and Verizon also purchased numerous licenses covering Cellular Market Areas, the smallest license size available. One small carrier with whom we spoke said that auctioning spectrum in smaller blocks has not necessarily helped small carriers because they are still competing with large carriers that have significantly more resources. In the aforementioned auction, Verizon and AT&T spent \$9.4 billion and \$6.6 billion, respectively, much more than other carriers. Nevertheless, according to one association with whom we spoke, a consequence of having some licenses cover large regions is that carriers who want spectrum to build out metropolitan areas must purchase a license covering entire regions and states. As a result, the association noted that some of these carriers leave the rural, underserved, or unserved areas of their licenses unbuilt. According to one regional carrier with whom we spoke, this trend will have negative consequences for wireless service in rural areas, as large national carriers will not have an incentive to continue to provide extensive or up-to-date coverage in areas with low population density. Some small and regional carriers with whom we spoke also said that they would further develop their networks in those rural and underserved areas, but are prevented from doing so by their inability to afford the entire spectrum license. Some carriers, though, are already offering some service in rural areas. Indeed, as the FCC showed in their most recent mobile wireless competition report, approximately 98.5 percent of the U.S. population living in rural census blocks have one or more different carriers offering mobile telephone service where they live.

³⁵In two recent auctions, FCC implemented procedures that allow entities to group together smaller licenses into larger blocks. This process was created, in part, in response to the inability of FCC to know the most efficient size of spectrum licenses in advance of the auctions.

³⁶According to recent FCC analysis, five carriers together hold more than 80 percent of spectrum that is suitable for the provision of mobile wireless services.

Figure 12: Spectrum License Maps



Source: FCC.

-
- Stakeholders had differing views on the effectiveness of FCC’s efforts to ensure spectrum is utilized efficiently. In order to prevent spectrum from remaining unused, particularly in rural and underserved areas, FCC told us that they have attached construction benchmarks to all 44,229 licenses auctioned since July 1994. For example, spectrum auctioned in 2006 only required that there be “substantial service” by the end of the license term in 2021.³⁷ FCC officials noted that substantial service is difficult to define and it has not had an opportunity to interpret it yet since these licenses have yet to come to term. The most recent large wireless spectrum auction included more specific benchmarks such as 35 percent geographic coverage within four years. According to FCC’s electronic reporting system, most license holders have met these benchmarks to date.³⁸ Nevertheless, some small and regional carriers and other stakeholders said that these requirements have been too lenient. They maintained that some carriers have been able to satisfy the construction benchmarks by building out only in densely populated metropolitan areas and along highways, leaving much spectrum underutilized, and coverage relatively poor in some rural areas. For example, many officials we spoke with in Minnesota maintained that many rural areas of Minnesota, such as stretches of roads between towns, lack wireless coverage because of lenient build-out requirements and economic limitations to building out in these areas.
 - Some stakeholders we interviewed, particularly small carriers and consumer groups, said that a spectrum cap should be reinstated in some form, preventing carriers with large amounts of spectrum from participating in certain auctions. According to these stakeholders, limiting the amount of spectrum any one entity can hold in particular markets can create opportunities for small and regional carriers to obtain spectrum. In 2001, FCC began eliminating its practice of spectrum caps in order to

³⁷FCC noted in the past that such “liberal” construction requirements were appropriate because they provided spectrum license holders needed flexibility, and that such minimum construction requirements can “promote efficient use of the spectrum; encourage the provision of service to rural, remote and insular areas; and prevent the warehousing of spectrum.” At the time of the auction, substantial service was defined as service which is sound, favorable, and substantially above a level of mediocre service which just might minimally warrant renewal. *Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (“WCS”)*, Report and Order, 12 FCC Red 10785 (1997) (WCS Report and Order).

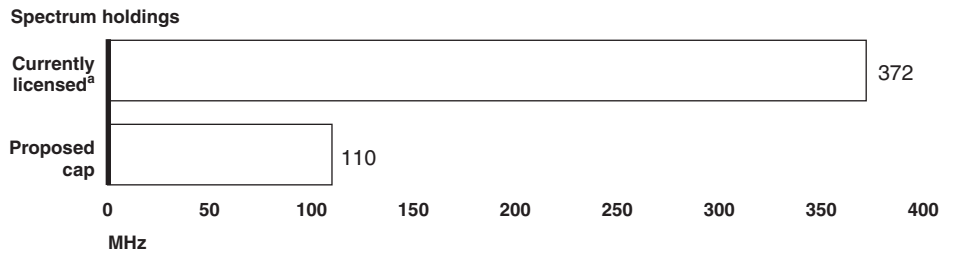
³⁸FCC monitors whether licensees are complying with build-out requirements by requiring licensees to submit periodic reports regarding the state of build-out and whether the applicable requirements were met. Since 1994, 6 percent of licenses have been terminated due to licensees’ failure to meet construction benchmarks.

facilitate greater economic efficiencies. While FCC told us it is difficult to identify the specific impact of eliminating the caps, some stakeholders we spoke with said that it has facilitated the consolidation of spectrum with the large national carriers. Other stakeholders, particularly large national carriers, maintained that spectrum caps were an artificial barrier to the growth of the wireless industry. In particular, they noted that as the need for more wireless capacity grows, networks require greater amounts of spectrum. Therefore, a spectrum cap could stifle innovation by precluding the deployment of next generation networks that provide faster connections to the Internet, but require large contiguous blocks of spectrum. Designing a practical spectrum cap could also be challenging. Not all spectrum is of equal utility to wireless carriers, since some frequencies travel farther distances and can better penetrate buildings, making those frequencies more valuable than others. Nevertheless, in response to the concerns of small carriers and consumer groups, the Rural Telecommunications Group petitioned FCC in 2008 to reimpose a spectrum cap (see figure 13 for an illustration of this proposal). In October 2008, FCC sought comments on the petition for rule making, and it continues to review these comments.³⁹ As the Congressional Research Service recently reported, implementing spectrum caps as a tool for regulating competition would represent a significant shift in policy for FCC, were it to take that course.⁴⁰

³⁹ *Comment on Petition for Rulemaking of Rural Telecommunications Group, Inc. to Impose a Spectrum Aggregation Limit on All Commercial Terrestrial Wireless Spectrum Below 2.3 GHz*, Public Notice, 23 FCC Rcd 14875 (2008).

⁴⁰ Congressional Research Service, *Spectrum Policy in the Age of Broadband: Issues for Congress* (Washington, D.C., Feb. 3, 2010).

Figure 13: Proposed Cap of Spectrum Below 2.3 GHz



Source: GAO analysis of FCC data.

^aThis includes bands below 2.3 gigahertz (GHz) that potentially may be used to provide mobile voice and data services: 50 megahertz (MHz) of Cellular spectrum; 19 MHz of Specialized Mobile Radio spectrum; 120 MHz of Broadband Personal Communications Service spectrum; 90 MHz of Advanced Wireless Services spectrum; 70 MHz of 700 MHz; 13 MHz in the 1.4 and 1.6 GHz bands; and 10 MHz at 1910-15/1990-95 MHz (currently held by Sprint Nextel as a result of the 800 MHz Band Reconfiguration).

- According to some stakeholders, including wireless carriers of various sizes with whom we spoke, spectrum auction bidding credits have been ineffective to date, partly as a result of their poor implementation. Bidding credits are a percentage discount applied to the high bid amount for a license if the bidder meets specific designated entity criteria—designed to make spectrum available to new entrants—established in the auction rules. Some stakeholders said that, in the past, large national carriers have used entities eligible for the credits as proxies, allowing eligible entities to win certain licenses and then acquiring the desired licenses from them later. For example, according to one small carrier with whom we spoke, a large regional carrier used a proxy with bidding credits to secure many spectrum licenses covering Iowa in a recent auction. This could result in it being even more difficult for the small carriers in Iowa to compete. In 2006, in part to address criticisms and concerns that FCC’s policies for awarding auction bidding credits were being manipulated to allow larger entities to finance smaller businesses as fronts to obtain access to spectrum at discounted rates, FCC strengthened its rules. These changes were designed to better achieve a balance between preventing the use of proxies and providing eligible entities with reasonable flexibility to obtain needed financing from investors.⁴¹ However, many midsized and regional carriers cannot use these bidding credits because, according to one stakeholder, they are not small enough to qualify, though they lack the

⁴¹There is a pending court challenge to the 2006 modifications. In addition, at FCC, there are pending petitions for reconsideration of those amendments and an open Further Notice of Proposed Rulemaking on the bidding credit rules.

resources to make them competitive with large national carriers. Finally, some new entrants into wireless markets have been unable to effectively utilize their spectrum. One new carrier that won spectrum licenses through its use of bidding credits declared bankruptcy shortly after winning the licenses. The Supreme Court later ruled that those licenses could not revert back to FCC to be reauctioned.⁴²

Special Access Policies. Many stakeholders outside of the top national carriers with whom we spoke expressed concern about the competitiveness of the market for special access services, a critical input for the provision of wireless services. Many wireless carriers are reliant on the special access capacity of a single provider in some markets in which they operate. In some cases, this provider is also a competitor in the wireless industry. As noted above, starting in 1999, FCC permitted the deregulation of special access rates in metropolitan areas where local firms could show that certain “competitive triggers” had been met. While competitors have entered segments of the special access market with their own wireline networks, our past work, as well as many stakeholders with whom we spoke, noted that competition has not expanded significantly in the wake of deregulation of special access markets.⁴³ Indeed, we previously reported that competitive alternatives for special access have declined in some metropolitan areas since the removal of price caps. As a result, according to some stakeholders with whom we spoke, the current structure of the market for special access services has a significant negative effect on competition in the wireless industry, particularly for carriers that rely on other companies to provide special access services. Some of these stakeholders told us that they are charged high special access rates or provided substandard service. However, industrywide data on the location, quantity, and capacity of available special access facilities and applicable rates are not consistently available, and would help to provide a factual basis for the extent to which, or whether, wireless competition is hindered by the market for these services.

According to some stakeholders with whom we spoke, there is a notable lack of competition for special access in rural areas. However, it is not

⁴²*FCC v. Nextwave Personal Communications, Inc.*, 537 US 293 (2003); the Supreme Court held that FCC was a creditor in this case, and under bankruptcy law, could not revoke Nextwave’s licenses simply because of nonpayment.

⁴³GAO, *Telecommunications: FCC Needs to Improve Its Ability to Monitor and Determine the Extent of Competition in Dedicated Access Services*, [GAO-07-80](#) (Washington, D.C.: Nov. 29, 2006).

clear whether the resulting high prices of special access services in rural areas are due solely to the low population density and long distances between facilities and, therefore, high costs of providing the services, or whether they also reflect excessively high special access prices as some parties have alleged. For example, stakeholders with whom we spoke in northern California stated that special access services can be of poorer quality for the incumbent's competitors, and competitors pay five times as much for services from Humboldt County to the city of Santa Rosa (north of San Francisco) as from Santa Rosa to San Diego. Some carriers have opted to self-provision through microwave backhaul facilities rather than use existing wireline infrastructure. One carrier stated that they have a department that seeks backhaul alternatives in each market due to the high special access rates.

Some Stakeholders Noted that Consumer Switching Costs May be Exacerbated by Particular Industry Practices

A key element of competitive markets is that consumers will switch among competitors in response to differences in services. In this regard, competition that benefits wireless users depends upon the likelihood that consumers can and will switch their service provider. However, according to some small carriers and consumer groups with whom we spoke, the process of switching wireless service providers can be an expensive process that deters consumers who might otherwise consider changing to a new carrier. Consumer switching costs, generally defined as the actual or perceived costs that customers associate with the process of changing from one carrier to another, occur in many markets and for a variety of reasons. In examining this issue, FCC has concluded that "consumers continue to pressure carriers to compete on price and other terms and conditions of service by freely switching providers in response to differences in the cost and quality of service."⁴⁴ FCC cited customer churn and the implementation of wireless local number portability (LNP) as the basis for its conclusion.⁴⁵ Though LNP removed an important impediment to switching wireless carriers, it does not necessarily mean that customers are able to switch freely among carriers. Indeed, some stakeholders with whom we spoke perceive early termination fees and exclusive handset arrangements as creating such anticompetitive switching costs. However, additional data are

⁴⁴*Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service*, Ninth Report, 19 FCC Rcd 20597 (2004).

⁴⁵Wireless LNP is a wireless consumer's ability to change service providers within the same local area and still keep the same phone number.

needed to fully assess the extent to which consumers are hindered from moving between wireless carriers.

Early Termination Fee Practices. Stakeholders with whom we spoke had divergent views on the benefits and harms of ETF associated with wireless service contracts, with some expressing concern about the costs they impose on consumers. Some large national carriers maintained that ETFs are essential for carriers to be able to offer advanced handsets at lower upfront prices. Other stakeholders noted that ETFs are important enforcement mechanisms for wireless contracts; without such penalties, carriers would not be able to offer the latest handsets at low upfront costs and would not be able to recoup their handset subsidy costs. For example, the Nexus One, a smart phone introduced in early 2010, was initially made available for \$530 without a contract or for \$180 for those signing a 2-year contract with T-Mobile. As part of that contract, though, consumers were initially subject to a \$350 “equipment recovery fee” from Google and a \$200 fee charged by T-Mobile when breaking a contract within the first few months of service. Google later lowered its fee to \$150. Some carriers have begun to prorate their ETFs. However, according to consumer groups with whom we spoke, lengthy standard contracts containing high ETFs present substantial obstacles for consumer movement between carriers. Officials with whom we spoke in Iowa noted that consumers are now facing higher than ever ETFs, which “take people out of the market” by locking them in to specific carriers. One consumer group with whom we spoke also noted that many consumers are unaware when their contracts are renewed or whether they are even under a contract. Similarly, our previous work suggested that some wireless phone consumers have experienced problems with billing, certain service contract terms, and customer service.⁴⁶ Specifically, our previous survey results indicated that about 34 percent of adult wireless phone users responsible for paying their bill received unexpected charges and about 31 percent had difficulty understanding their bill at least some of the time. Among wireless users who wanted to switch carriers during this time but did not do so, we estimated that 42 percent did not switch because they did not want to pay

⁴⁶ [GAO-10-34](#).

an ETF.⁴⁷ A recent FCC survey also found that a majority of personal cell phone users said the ETF was at least somewhat influential in keeping service with their current carrier. Such obstacles can limit the choice and movement of consumers, lessening the competitive pressure on these large carriers while also making it difficult for small and regional carriers to secure new subscribers. Several state consumer advocates with whom we spoke also noted that consumers often are unaware of the ETFs they are subject to, and generally find the terms and conditions of wireless contracts confusing. FCC recently announced that it is exploring whether wireless carriers should be required to warn subscribers when they are incurring roaming charges or overage fees.⁴⁸ Furthermore, in response to specific concerns with Verizon's ETFs, FCC sent a letter of inquiry to the company in fall 2009. Not satisfied with the response, FCC sent out more letters in late January 2010 to the large national wireless carriers and Google, asking for detailed information and data on ETFs. FCC received responses in February 2010 and is currently examining that information in preparation for a Notice of Proposed Rulemaking dealing with a number of consumer issues, including ETFs.

Exclusive Handset Practices. Stakeholders, particularly economists and some large carriers, with whom we spoke maintain that exclusive handset arrangements benefit consumers by facilitating innovation. For instance, when a carrier can guarantee a particular sales volume to a manufacturer, it facilitates that manufacturer's investments in research and development. Carriers can also contribute to innovation through direct collaboration with manufacturers on design elements. Exclusive contracts may also help provide better services to consumers by ensuring that carriers invest in specific facilities or human capital needed to support new devices. Additionally, such deals, and the close collaboration that results, may also facilitate the coordination of marketing efforts and assurance of product quality.

⁴⁷We estimated that about 19 percent of wireless users wanted to switch carriers during 2008 and early 2009 but did not do so. The 42 percent of these wireless phone users who wanted to switch but did not because of the ETF has a margin of error +/- 7.4 percent. Additionally, among the wireless users who did not indicate they were satisfied with the terms of their wireless phone service, we estimate that 25 percent were not satisfied because of ETFs. Wireless users were asked about their satisfaction with the terms of their service in general, not specifically since the beginning of 2008. The margin of error for the estimate of wireless phone users who were not satisfied with the terms of their service because of early termination fees is +/- 6.7 percent.

⁴⁸*Comment Sought on Measures Designed to Assist U.S. Wireless Consumers to Avoid "Bill Shock,"* Public Notice, DA-10-803, 2010 FCC Lexis 2905 (CGB rel. May 11, 2010).

Other stakeholders disputed the notion that carriers contribute much to the innovation and quality of new wireless devices when entering exclusive arrangements with manufacturers and said that such deals can hinder competition. For example, one manufacturer stated that such contracts only help them determine when they will enter the U.S. market, as they conduct research independently and operate on a global scale. According to some small carriers and other stakeholders, exclusive handset deals are largely the result of the largest carriers' ability to exploit their market power in the mobile wireless market by requiring that device manufacturers enter into exclusive arrangements. Others noted, though, that manufacturers can be the ones to exert market power when offering popular and innovative devices that carriers would like to offer. The lack of availability of particular handsets to all consumers can also have the practical effect of limiting competition, especially from small and regional carriers, since these carriers are forced to offer handsets to consumers that may not provide as much functionality as those offered by the large national carriers. Finally, many consumer groups with whom we spoke noted that such deals hinder consumer choice by limiting particular handsets to specific carriers.

Local Government Policies Can Delay the Development of Wireless Networks

According to many national wireless carriers, tower companies, and other stakeholders with whom we spoke, the most common barrier to building out a wireless network is local zoning policies and procedures which can delay or otherwise hinder the physical construction and improvement of wireless networks. Wireless carriers must generally obtain state and local zoning approvals before building wireless towers or attaching equipment (co-location) to preexisting structures. Although these zoning processes do not always pose a challenge to wireless carriers and tower companies, in some instances they can encumber buildout by denying zoning permits or by making the process for constructing cellular towers and antennas cost prohibitive. Many stakeholders with whom we spoke said that in California, for example, there continues to be significant public concern over the aesthetic and health impacts of wireless infrastructure. As a result, locating wireless facilities can be challenging in cities such as San Diego and San Francisco. Other stakeholders told us that, as wireless networks have expanded into residential areas, residents have raised concerns about aesthetics and safety, making it difficult to provide the capacity necessary to serve the growing demand for wireless services. Washington, D.C., and other cities with unique or historic buildings and skylines can also impose limitations on network build out, such as height restrictions on towers.

Local jurisdictions with whom we spoke noted their obligation to balance their communities' desire for wireless coverage with aesthetic, historical, environmental, cultural, and health priorities. While improved wireless coverage is a desire of many areas, the perceived impacts of wireless infrastructure and services can be concerns of local residents. Such concerns can, in some cases, outweigh the benefits of wireless coverage, particularly when there are other options for locating infrastructure.

Local governments and wireless entities have generally been able to reach agreements on the conditions of wireless network construction, despite the challenges noted above. Some local jurisdictions have developed ordinances specifically for wireless infrastructure in order to make their preferences and requirements clear to carriers and tower companies. Carriers have also developed and adopted a variety of disguising or "stealth" technologies that help mask towers and other infrastructure. Figure 14 shows a stealth tower in Eureka, California, where the antennas were hidden inside a bell tower on church grounds. In San Francisco, to avoid aesthetic concerns and procedural challenges, wireless carriers have developed Distributed Antenna Systems in recent years. Instead of using large towers or antennas on buildings, these systems involve a series of small antennas, deployed low to the ground, often on utility poles, that together provide wireless coverage.

Figure 14: Disguised Cellular Tower in Eureka, California



Source: GAO.

Some wireless carriers and tower companies maintained that national efforts, to date, to facilitate the siting of wireless infrastructure have been of limited utility. The National Broadband Plan noted that securing rights

to telecommunications infrastructure is often a difficult and time-consuming process that discourages private investment. It calls for the government to do more to reduce the costs incurred by private industry when using public infrastructure. To encourage the expansion of wireless networks, Congress has required local jurisdictions to act “within a reasonable period of time” on zoning requests.⁴⁹ FCC recently defined time frames for such action on wireless facilities siting requests, while also preserving the authority of states and localities to make the ultimate determination on local zoning and land use policies.⁵⁰ This “shot clock” ruling found that a “reasonable period of time” for a state or local government to act on a personal wireless service facility siting application is 90 days for infrastructure being placed on existing structures and 150 days for new facility applications. State or local governments must also declare an application “complete” within 30 days. The lack of a decision within these time frames constitutes a “failure to act,” based on which a wireless carrier may commence an action in court. However, this recourse can be very expensive, according to some stakeholders. Some stakeholders praised this ruling, but said that they expected it to have little impact, either because local processes already fell within these time limits or because local jurisdictions would find other ways to delay or deny wireless infrastructure applications. Some local jurisdictions also noted that the ruling fails to recognize the role carriers play in delays and challenges associated with infrastructure. For example, inflexibility on the part of carriers or incomplete applications can hinder zoning decisions.

Challenges to wireless network buildout in rural areas tend to be more financial than procedural. For example, most of the local government officials with whom we spoke in West Virginia said that they encourage co-location of wireless antennas on existing structures, as this process is simpler and less disruptive than building a new tower. However, they and others in rural markets maintained that, in general, they welcomed new wireless facilities and the coverage they bring. In Red Lake County, Minnesota, companies can simply build towers where they want because the county, and its cities and townships, have no ordinances or procedures for tower construction. Nevertheless, many local government and other

⁴⁹ 47 U.S.C. §332(c)(7)(B)(ii).

⁵⁰ *Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Pre-empt Under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance*, Order, 25 FCC Rcd 1215 (2009).

officials with whom we spoke in rural areas said that a major challenge for building wireless networks in these areas is the cost. Constructing and maintaining the infrastructure can be cost prohibitive due to low population density, difficult topography, or lack of existing infrastructure such as power sources and wireline infrastructure. In West Virginia, for instance, one of the biggest issues limiting the provision of wireless service is the mountainous terrain, because most wireless service depends on line-of-sight. Two carriers told us that, in effect, they subsidize this infrastructure with revenues generated in metropolitan areas. When it is not possible or desirable for a carrier to build out in these areas, coverage can be inconsistent or nonexistent. To address this challenge, the state of West Virginia, for example, has established a fund for subsidizing wireless infrastructure projects in underserved areas. Subsidies from the Universal Service Fund High-Cost program, which helps carriers provide services to rural and high-cost areas, have also helped some wireless carriers provide services in unprofitable areas, according to some stakeholders. For example, one carrier with whom we spoke said that these subsidies have made it possible for it to build out its network in rural Iowa. Without such funds, the infrastructure in these areas would not be sustainable.

FCC Employs Various Strategies to Monitor Competition in the Industry, but Its Annual Report Is Missing Some Data on Inputs and Outputs

FCC uses three strategies to oversee and monitor competition in the wireless phone industry: its annual wireless competition report to Congress, its review of proposed mergers, and its investigations of competitive complaints. The primary tool that it uses is the annual mobile wireless competition report, which relies on limited data sources and does not assess some industry inputs and outputs. In assessing mergers, FCC balances potential public interest benefits and harms. Generally in response to complaints, FCC has also undertaken a variety of investigations and inquiries related to competitive challenges.

FCC Conducts Annual Reviews of Competition Based Primarily on Third-Party Data, But Does Not Collect or Assess Detailed Data on Some Inputs and Outputs

In the Omnibus Budget Reconciliation Act of 1993, Congress established the promotion of competition as a fundamental goal for wireless policy formation and regulation. To measure progress toward this goal, the 1993 Act required FCC to submit an annual report that analyzes competitive conditions in the wireless industry.⁵¹ This report remains a key basis on which federal wireless policies and regulations are developed and the primary tool used by FCC to monitor competition in the wireless industry. As discussed above, the cost and challenges associated with investments, including special access, capital expenditures, and equipment, could affect the prices charged to consumers and the number of competitors in the wireless industry.⁵² For its latest annual report, released in May 2010, FCC undertook a process that significantly improved its report.⁵³ For example, FCC based its analysis of competitive market conditions on a range of indicators, including some new data on “downstream segments” of the industry, such as spectrum and equipment. However, FCC collects little original data on some industry inputs and consumer switching costs, generally using third-party data to report on industrywide trends. This hinders FCC’s ability to examine the extent of competition in specific markets and sections of the industry. By collecting and analyzing more detailed data on industry outputs (such as prices) and inputs (such as special access rates), FCC could better assess competition in the wireless industry. Indeed, the recently released National Broadband Plan calls for collecting, analyzing, benchmarking, and publishing “detailed, market-by-market information on broadband pricing and competition.”

We identified four industry measures that lack original data collection on the part of FCC:

- *Prices.* As discussed earlier, the prices of wireless voice, text, and data services are indicators of competition. As noted above, the Consumer Price Index indicates that wireless prices have generally declined since the

⁵¹Section 6002 of the Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 393 (1993).

⁵²As FCC itself noted, its overall framework proceeds from the premise that indicators of market structure such as the number of competitors and their market shares are not, by themselves, a sufficient basis for determining whether there is effective competition, and whether any of the competitors have a dominant share of the market for commercial mobile services.

⁵³*Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, Fourteenth Report, FCC 10-81 (rel. May 20, 2010).

late 1990s. However, this industrywide data masks variations in wireless plan prices. A more detailed analysis of prices charged could help better measure competition and efficiency in the market.

- *Special Access.* Rates for special access are a significant expense for wireless carriers because connections to backhaul provided by special access are an integral component of wireless networks. While FCC acknowledges that it has authority to collect special access rate data, it does not regularly monitor and measure the development of competition for special access.⁵⁴ However, FCC is examining the current state of competition for special access services to determine the level of competition and ensure that rates for these services are just and reasonable.⁵⁵ To the extent rates are not just and reasonable, special access may serve as a barrier to entry and growth for some wireless carriers. As noted above, the current structure of the market for special access services may have significant negative effect on competition in the wireless industry. Without data on these rates, it is difficult to assess the extent to which the special access market creates barriers to entry and growth.
- *Capital Expenditures.* Without better information on carrier investment in networks and innovation, it is difficult to determine whether markets are truly competitive and growing, or dominated by large carriers facing little competitive pressure to invest. Additionally, better data on capital expenditures could help identify underserved areas, such as rural markets receiving little new wireless construction.
- *Devices and Equipment.* Because the cost and availability of this equipment is a challenge for small and regional carriers, it may create barriers to entry and growth since these are critical inputs to the industry. Obtaining more data to gain a better understanding of the role equipment

⁵⁴In our previous work, we noted that the data necessary for FCC to effectively analyze trends in special access competition were not provided by incumbents, competitors, and special access customers. Furthermore, the information that has been provided is of limited reliability, coming from parties that would directly profit from further deregulation or regulation. See [GAO-07-80](#).

⁵⁵*Parties Asked to Comment on Analytical Framework Necessary to Resolve Issues in the Special Access NPRM*, Public Notice, 24 FCC Rcd 13638 (2009). FCC officials told us that they plan to issue a Notice of Proposed Rulemaking on special access issues no later than the fourth quarter of 2010.

costs and ETFs play in making carriers competitive and hindering customers' movement between carriers is important.

In the past, FCC has generally not collected data on many industry investments and metrics because of the complexity and burden associated with gathering this data from wireless carriers. Additionally, FCC has generally taken a deregulatory approach to the industry, imposing few reporting requirements on wireless carriers. FCC officials stated that they must balance the benefit of collecting detailed industry data with the burden it places on carriers. Nevertheless, in August 2009, FCC released a Notice of Inquiry on its annual mobile wireless competition report seeking to expand and enhance its analysis of competitive conditions, both to improve its assessment of the current state of competition in the entire mobile wireless marketplace and to better understand the net effects on the American consumer.⁵⁶ FCC received a variety of comments from industry stakeholders and incorporated new data into the latest mobile wireless competition report on spectrum holdings, wireless usage (including messaging and data services), devices, and expenditures. FCC has also undertaken ad hoc inquiries, described later, that have resulted in some original data collection. These actions illustrate that FCC is rethinking the relative benefits and costs of data collection. However, FCC still lacks detailed data on prices charged and costs incurred by wireless carriers. Without such information, FCC is missing important information that can shed light on the state of competition in the wireless industry, which can ultimately lead to missed opportunities to protect and enhance consumers' experience in the market.

FCC Considers Potential Benefits and Harms to the Public Interest When Assessing Mergers

In evaluating proposed mergers involving transfers of control of spectrum licenses, FCC conducts a "public interest" inquiry to assess whether the public interest, convenience, and necessity will be served by a proposed merger as part of its duties to monitor the wireless industry. The public interest inquiry is informed by, but not restricted to, traditional antitrust principles.⁵⁷ According to FCC officials, through this test, it seeks to understand how the transaction will benefit the public. More specifically,

⁵⁶24 FCC Rcd 11357, Aug. 27, 2009.

⁵⁷FCC's public interest test is based on its statutory authority under the 1996 Act, 47 U.S.C. §214 and §310. The Department of Justice Antitrust Division assesses proposed mergers to determine whether they would specifically violate sections 1 and 2 of the Sherman Act, 15 U.S.C. §§1 and 2 and section 7 of the Clayton Act (15 U.S.C. §18).

FCC first assesses whether the proposed transaction complies with the specific provisions of the Communications Act, other applicable statutes, and the Commission's rules. If the transaction does not violate a statute or rule, FCC next considers whether it could result in public interest harms. FCC then employs a balancing test weighing any potential public interest harms of the proposed transaction, such as a reduction in the number of competitors in a particular market, against any potential public interest benefits, such as enhanced wireless coverage and efficiencies. Under the Commission's review, the burden is on the applicants to show that the transaction will serve the public interest. FCC's public interest evaluation includes, among other things, a preference for preserving and enhancing competition in relevant markets, accelerating private sector deployment of advanced services, promoting a diversity of license holders, and generally managing the spectrum in the public interest. As part of its considerations, FCC puts all proposed mergers out for public comment.

FCC is able to attach conditions to approved mergers.⁵⁸ Such conditions are tailored to address the anticipated public interest harms based on economic analysis, examination of documents submitted in response to FCC inquiry, and public comments contained in the record. The conditions can include divestiture of spectrum licenses in particular markets or other requirements designed to mitigate public interest harms. For example, while FCC approved AT&T's acquisition of Centennial in November 2009, it concluded that the "transaction would likely pose significant competitive harms in seven local mobile telephony/broadband services markets" and that these "potential harms would not be outweighed by the proposed transaction's alleged public interest benefits."⁵⁹ FCC required AT&T and Centennial to divest Centennial's assets in those seven markets. The Commission also required that AT&T honor all of Centennial's existing roaming services agreements with other carriers.

FCC enforces merger conditions in various ways. To ensure proper divestiture of assets, FCC imposes time limits on the sale of spectrum licenses. It also individually reviews and approves these transactions. FCC officials told us that, to date, all such applications have been approved. When other requirements are imposed, such as roaming conditions, FCC

⁵⁸47 U.S.C. §310(d).

⁵⁹*Applications of AT&T Inc. & Centennial Communications Corp., For Consent to Transfer Control of Licenses, Authorizations, and Spectrum Leasing Arrangements*, Memorandum Opinion and Order, 24 FCC Rcd 13915 (2009).

relies on complaints from wireless carriers to identify failures to comply with merger conditions. One regional carrier with whom we spoke noted that roaming conditions placed on a carrier they worked with were not being honored in a timely manner, creating challenges for its business in a particular area. While the carrier said that it brought this issue to the attention of FCC, the Commission maintained that it received no complaints concerning this matter.

FCC Has Undertaken a Variety of Investigations of Competitive Challenges

A third means by which FCC monitors competition is its ability to conduct investigations of practices that may affect competition in the wireless industry, as well as resulting enforcement actions. These investigations can be self-initiated or undertaken in response to complaints from consumers or the industry. FCC Enforcement Bureau officials told us that they worked on over 2,300 wireless-related investigations between January 2008 and April 2010. Most of these investigations were based on complaints, though about 8 percent were self-initiated and about 12 percent were referrals from other FCC bureaus. Such investigations can involve technical issues such as spectrum interference, as well as anticompetitive practices and consumer concerns. These investigations can result in actions against specific entities or findings of no harm caused. While it cannot conduct investigations itself, the FCC Wireless Bureau has carried out requests for information in order to determine whether investigations or rule makings are needed. As noted above, FCC is currently examining information collected about ETFs in preparation for a Notice of Proposed Rulemaking.

Conclusions

FCC's annual mobile wireless competition report is the main vehicle by which it monitors the wireless industry; as such, it is the primary source of information and analysis of competition in the retail market for consumers and wholesale markets for carriers. Concerns have been raised about the competitiveness of these markets in recent years, and changes in the industry such as consolidation have created new issues and challenges for consumers and carriers. Recognizing these concerns and changes, FCC recently undertook a process that significantly improved its annual mobile wireless competition report. However, FCC could do more to examine whether or not there is effective competition in the wireless industry. By collecting and analyzing more detailed data on industry inputs and outputs that reflect industry dynamics, FCC could better assess competition conditions throughout the industry. Specifically, FCC could collect more detailed data on such issues as prices, special access rates, and capital expenditures and include analysis of that information in its annual report.

These metrics help measure the competitiveness of small and regional carriers, can shed light on the impact of switching costs for consumers, and are, therefore, relevant to monitoring competition in the industry. Despite challenges and costs in gathering these data, such information could help FCC better fulfill statutory reporting requirements. With consumers increasing reliance on wireless services as their primary telephone and Internet connection, more is needed to ensure that FCC and the Congress have sufficient information to make policy decisions concerning the wireless industry.

Recommendation for Executive Action

FCC should assess whether expanding its original data collection of wireless industry inputs and outputs—such as prices, special access rates, capital expenditures, and equipment costs—would help it better satisfy its requirement to review competitive market conditions with respect to commercial mobile services.

Agency Comments

We provided a draft of this report to FCC for its review and comment. FCC took no position on our recommendation but provided technical changes which were incorporated as appropriate.

As we agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of this letter. The report also is available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or goldsteinm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix II.

A handwritten signature in black ink, appearing to read 'M. Goldstein', with a long horizontal flourish extending to the right.

Mark L. Goldstein
Director, Physical Infrastructure

List of Requesters

The Honorable John D. Rockefeller, IV
Chairman
Committee on Commerce, Science,
and Transportation
United States Senate

The Honorable Henry A. Waxman
Chairman
Committee on Energy and Commerce
House of Representatives

The Honorable Rick Boucher
Chairman
Subcommittee on Communications,
Technology, and the Internet
Committee on Energy and Commerce
House of Representatives

The Honorable Daniel K. Inouye
United States Senate

The Honorable Amy Klobuchar
United States Senate

The Honorable Ron Wyden
United State Senate

The Honorable Edward J. Markey
House of Representatives

Appendix I: Scope and Methodology

To determine the ways in which the industry has changed since 2000, we identified and analyzed quantitative data from a commercial database purchased from SNL Kagan, as well as data from the Bureau of Labor Statistics, UBS Investment Research's March 2010 *Wireless 411* report, and the year-end 2009 CTIA semiannual survey of wireless carriers. Due to the proprietary nature of some information about the wireless industry and specific carriers, we were limited in the data we could collect and publish. Where there were data available from multiple sources, we combined data (noted in the figures) to provide as complete a picture of changes in the industry as possible. We first determined, however, whether there were any inconsistencies between the data sets. Working with a design methodologist we developed a decision rule to use when attempting to combine data from the different data sets. If there were inconsistencies but the percentage difference was below 10 percent, we combined the data; if the difference exceeded 10 percent we did not use the secondary data set. We took several steps to ensure the reliability of the data including determining where the original data came from, and the procedures and controls for ensuring the accuracy of the data available. As our primary data source, we also obtained a copy of SNL Kagan's data collection procedures. As part of our data reliability assessment, we found that the multiple data sets corroborated each other and all of the data to be sufficiently reliable for our purposes. To complement the quantitative data, we analyzed public comments submitted in response to the Federal Communications Commission's (FCC) August 2009 Notice of Inquiry on the annual mobile wireless competition report.

To determine the implications of industry changes on consumers and competition, as well as stakeholders' perceptions of the effect of various industry practices and regulatory policies, we interviewed a variety of stakeholders. These stakeholders included FCC Wireless Telecommunications, Wireline Competition, and Enforcement Bureau officials, device manufacturers, tower companies, industry associations, consumer groups, and academic and industry experts. We also interviewed the top seven wireless carriers, by subscribers, smaller carriers operating in or near our case study markets, and some regional carriers recommended to us by experts and associations. These stakeholders are listed table 1; this list does not include government officials with whom we spoke, such as FCC representatives and local planning departments. Many of these stakeholders, as well some our internal stakeholders, provided us with relevant literature on the wireless industry, including studies of spectrum policies and handset exclusivity.

Table 1: Stakeholders Interviewed for this Report

Consumer groups
AARP
Consumers Union
Free Press
Media Access Project
Public Knowledge
The Utility Reform Network
Wireless industry associations
ACG - Associated Carrier Group
CTIA - The Wireless Association
NTCA - National Telecommunications Cooperative Association
PCIA - The Wireless Infrastructure Association
RCA - Rural Cellular Association
RTG - Rural Telecommunications Group
WCAI - Wireless Communications Association International
Wireless phone service carriers
AT&T
Cellular One of East Central Illinois
Cellular South
Chat Mobility
Garden Valley Telephone Company (Telispire)
Gardenville Cooperative Telephone Association (GC Cellular)
Golden State Cellular
Leap Wireless (Cricket)
MetroPCS
nTelos
Premier Communications
Sprint Nextel
T-Mobile
Verizon
U.S. Cellular
Tower companies
Crown Castle
Global Tower Partners
Milestone Communications
Device manufacturers and network operators
Cisco
Ericsson
FiberTower
Google

Research institutions

- Center for Business and Public Policy at Georgetown University
- Columbia Institute for Tele-Information
- Information Economy Project at George Mason University
- Information Sciences Institute
- Phoenix Center

Source: GAO interviews.

We also conducted case studies in both an urban and rural cellular market area in four states as well as the District of Columbia (see table 2). In these case study markets, we spoke with regional representatives of some large carriers and tower companies, city and county government officials, state utility commissions and consumer groups, telecommunications and economic development experts, and some small wireless carriers. Because local jurisdictions do not have the authority to regulate wireless services, our case study interviews primarily focused on tower permitting processes and officials’ perceptions of the local manifestation of national trends in areas such as consolidation and special access services.

Table 2: Cellular Market Areas (CMA) Used as Case Studies

CMA	Constituent counties	Major cities
San Francisco-Oakland, Calif. (CMA#7)	Alameda, Contra Costa, Marin, San Francisco, San Mateo	Berkeley, Oakland, San Francisco
Washington, D.C. (CMA#8)	Arlington (Va.), Charles (Md.), Fairfax (Va.), Loudoun (Va.), Montgomery (Md.), Prince George’s (Md.), Prince William (Va.)	Alexandria, Washington
Minneapolis-St. Paul, Minn. (CMA #15)	Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott, St. Croix (Wis.), Washington, Wright	Minneapolis, St. Paul
Des Moines, Iowa (CMA #102)	Dallas, Polk, Warren	Des Moines
Charleston, W.Va. (CMA #140)	Kanawha, Putnam	Charleston
Del Norte, Calif. (CMA#336)	Del Norte, Humboldt, Siskiyou, Trinity	Arcata, Eureka, McKinleyville
Lyon, Iowa (CMA#427)	Cherokee, Lyon, O’Brien, Osceola, Plymouth, Sioux	Cherokee, Le Mars, Orange City
Kittson, Minn. (CMA #482)	Kittson, Marshall, Pennington, Red Lake, Roseau	Roseau, Thief River Falls
Mason, W.Va. (CMA #701)	Calhoun, Jackson, Mason, Roane	Point Pleasant, Ripley

Source: GAO analysis and interviews.

The case study sites were selected based on the following criteria:

- Population (to identify sparsely and densely populated areas);
- Number of competing carriers (to identify areas with many and few competing carriers);
- Number of carriers receiving Universal Service Fund High-Cost program subsidies (to identify areas with few eligible telecommunications carriers and many); and
- Suggestions from experts (to utilize their understanding of unique challenges in different regions of the country).

The case studies are illustrative examples that provide in-depth descriptive information about challenges identified through other sources. Because the case study selection is based on a nonprobability sample, they cannot be generalized to all cellular market areas.

To determine the strategies employed to oversee and monitor competition, we interviewed FCC Enforcement, Wireless, and Wireline Competition Bureau officials about what strategies they use to monitor and oversee competition. We also met with the Department of Justice Antitrust Division officials to discuss their specific role in the oversight of competition in the wireless industry. Furthermore, we interviewed the stakeholders mentioned above about the impact of FCC's current strategies to oversee and monitor competition in the industry. In addition to interviews, we reviewed relevant portions of the 1993 Omnibus Budget Reconciliation Act and the 1996 Telecommunications Act.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Mark L. Goldstein, (202) 512-2834 or goldsteinm@gao.gov

Staff Acknowledgments

In addition to the contact named above, Michael Clements, Assistant Director; Pedro Almoguera; Kyle Browning; Swati Deo; Colin Fallon; David Hooper; Sara Ann Moessbauer; and George Quinn made key contributions to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday afternoon, GAO posts on its Web site newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to www.gao.gov and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's Web site, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Ralph Dawn, Managing Director, dawnr@gao.gov, (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548

