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TELECOMMUNICATIONS

Competition in the Mobile Communications Industry

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Mr. Chairman and Members of the Subcommittee:

Cellular telephone companies have experienced an explosive growth in the number of subscribers over the past decade. There were 340,000 cellular subscribers in the United States in 1985, 5.3 million by 1990, and over 25 million by February of 1995. The growth rates in subscribership were between 40 and 50 percent annually in each of the last 5 years.

We are pleased to be here today to update our 1992 report and testimony on competition in the cellular telephone industry.¹ At that time, two cellular telephone companies in each market area provided most mobile telecommunications. Today, however, many changes are occurring in this industry that could lead to more competition. Our testimony today will discuss some of the key changes occurring in the industry and their impact on competition, including a recent proposal that would provide resellers² a larger role in the market.

In summary:

- In 1992, we reported that the two-carrier system that the Federal Communications Commission (FCC) created for the cellular industry was unlikely to provide significant competition because markets with only two firms are often not competitive, and, in this case, no new firms were able to enter the market without action by FCC. Additionally, there were no good substitutes for cellular telephone service at that time.
- Since 1992, the Congress and FCC have been significantly increasing the amount of radio spectrum available for mobile telecommunications and allowing new companies to provide these services.³ Additionally, advances in technology are allowing existing and new companies to more efficiently utilize the radio spectrum set aside for mobile

¹See Telecommunications: Concerns About Competition in the Cellular Telephone Service Industry (GAO/RCED-92-220, July 1, 1992) and Telecommunications: Competition in the Cellular Telephone Service Industry (GAO/T-RCED-92-72, July 1, 1992).

²Resellers are firms that buy cellular service at wholesale rates from licensed cellular carriers and resell those services to consumers.

³Mobile telecommunications are made possible through the use of radio spectrum, or radio waves.

telecommunications, and thus to carry more calls with a given amount of spectrum.

- New providers are now in the process of building their infrastructure and will probably enter the market during the next one to two years. Their services will put them in direct competition with existing companies. We believe that these developments should result in more competition, more service options, and lower prices for consumers.
- Cellular resellers are proposing to expand their role in delivering cellular service; doing so, they believe, will create more competition and benefit consumers. Our analysis suggests that the reseller proposal is unlikely to provide lower prices, on average, for consumers because resellers will still have to buy some wholesale services from the licensed carriers, and thus will not be competing with them at the wholesale level.

To obtain the information needed for this testimony, we interviewed officials at more than 20 companies, trade associations, and FCC. We also spoke with and obtained relevant documents from economic and telecommunications experts.

BACKGROUND

Wireless communications can be used to augment or replace the traditional "wireline" telephone system. For example, a mobile user can communicate with another mobile user (or someone on the wireline system) through the use of a two-way radio link that carries signals to and from a mobile user and transmits them to and from someone at another location. A long-standing example of this technology is the radio dispatch service commonly used by police departments and public utility companies. As a society on the go, Americans have always been intrigued by the concept of mobile telephones. Decades ago, radio telephone service that enabled a mobile user to connect to someone on the wireline telephone system was available but limited in scope because, given the technology employed at the time, only a small number of users could be served. Beginning in the late 1940s, researchers began working on a way to serve many more users through a "cellular" concept. With cellular technology, a given geographic area is divided into smaller units, or "cells," and a radio tower is erected within each that transmits signals only inside of the small geographic area. This allows a radio signal in one cell to carry a transmission without interfering with a transmission on the same frequency within another cell. The result of the cellular design is that the assigned radio frequencies may be "reused" over and over throughout the geographic area.

FCC is authorized to allocate and regulate the use of the radio spectrum (radio waves) under the authority of the

Communications Act of 1934. In 1981, FCC allocated spectrum for cellular telephone service and determined that two companies in each geographic area would be licensed to build facilities and offer such service.⁴ FCC allocated 50 megahertz of spectrum to the cellular industry, providing each firm 25 megahertz.⁵ At that time, FCC believed that, given the amount of spectrum it was allocating for this industry, two companies were the most that could efficiently provide service. Moreover, the traditional telephone industry was still dominated by AT&T at that time, so a two-carrier market was viewed as an improvement in terms of competition.

COMPETITION IN THE MOBILE
TELECOMMUNICATIONS INDUSTRY IN 1992

In 1992, we reported that the two-carrier system that FCC created for the cellular industry was unlikely to provide significant competition because markets with only two firms are often not competitive. Moreover, in the case of the cellular industry, no new firms could enter the market without action by FCC. Furthermore, we found that other mobile telecommunications available at that time, such as paging services, and specialized mobile radio (SMR) (which provides dispatch service to, for example, taxi companies) were providing services that did not directly compete with cellular telephones.

At the time of our report, FCC was in the process of granting one SMR provider (now called Nextel) that was already licensed to use a portion of the radio spectrum the right to modify its networks to allow a cellular design. This would enable the firm to utilize its share of the spectrum better and provide new services to its users. At that time, a company official told us that Nextel's offerings would be competitive with those of cellular companies and would help to make the market more competitive.

We also reported that the concept of personal communications services (PCS), a broad range of radio communications services that can be used to deliver voice, data, and images, was being developed. We noted that PCS had the potential to be in direct competition with cellular telephones. We expressed optimism that the entry of PCS could put pricing pressure on cellular companies. In an effort to enhance the competitive impact of PCS, we

⁴In the cellular industry, licenses were issued for 306 metropolitan statistical areas (MSA) and 428 rural statistical areas (RSA).

⁵The original allocation of spectrum for cellular was 40 megahertz divided equally between the two firms in each market. In 1986, an additional 10 megahertz, divided equally again, was allocated to the two existing cellular firms.

recommended that first preference for PCS licenses in each market area be given to firms other than the two cellular companies already serving that market.

Finally, we addressed the competitive impact of cellular resellers. We stated that because resellers did not own or operate cellular facilities, they did not compete with carriers at the wholesale level and would not generally induce more competitive pricing for consumers.

LEGISLATIVE, REGULATORY, AND TECHNICAL CHANGES SINCE 1992 COULD AFFECT THE MOBILE TELECOMMUNICATIONS MARKET

Recent actions by the Congress and FCC provide significantly more spectrum to new firms in the mobile telecommunications industry. FCC also has allowed more flexibility to existing providers in the use of previously allocated radio spectrum. Additionally, advances in the technology of mobile telecommunications are enabling providers to use the spectrum more efficiently.

New Allocations of Spectrum Will Allow Several New Companies to Enter the Mobile Telecommunications Market

The Omnibus Budget Reconciliation Act of 1993 authorized FCC for the first time to use competitive bidding, that is, an auction, to award spectrum licenses. Before the passage of this act, FCC was authorized to allocate mutually exclusive spectrum to applicants through either lotteries or hearings in which FCC selected the best applicant.

In 1993, FCC set aside 120 megahertz for broadband PCS.⁶ Half of that allocation has been awarded for two licensed blocks of 30 megahertz each in 51 market areas. FCC awarded these 102 licenses earlier this year, most by an auction that raised \$7.7 billion for the U.S. Treasury. According to FCC officials, another 30-megahertz block will begin to be auctioned in December of 1995, and the remaining broadband PCS spectrum is currently scheduled to be

⁶Broadband PCS spectrum comprises a wide band of frequencies and therefore has the capacity for two-way voice and data communications similar to the cellular industry's. The 120 megahertz allocation has been divided into two 30-megahertz blocks of spectrum that are geographically divided into 51 major trading areas (MTA), as defined by Rand McNally and Company. The remaining 60 megahertz is split into one 30-megahertz block and three 10-megahertz blocks, each of which is divided geographically into smaller units. FCC also allocated and auctioned a small amount of spectrum for narrowband PCS (with less capacity), which will be used by paging companies to enhance their services.

auctioned over the next year. FCC's rules require that the recent PCS auction winners build their networks sufficiently so that within 5 years of licensing, they are able to provide coverage to at least one-third of the people in their service area.

FCC designed the PCS auctions to enhance competition. FCC's rules limit PCS firms to a maximum of 40 megahertz of PCS spectrum in any market area. After January 1, 2000, cellular operators will also be subject to a 40-megahertz cap on their holdings of both PCS and cellular spectrum.⁷ These limits provide that, after all of the spectrum is allocated and firms have entered the market, there should be at least five service providers in each market area.⁸

In addition to the cellular and PCS companies, many markets will have services available from Nextel and other so-called "wide-area" SMR providers that have been authorized by FCC to modify their networks to a more cellular-like structure. Nextel has already begun providing its enhanced services in several cities, and an official of the company told us that by the end of 1996, it would have enhanced services available throughout wide regions of the United States.

Technological Advances Will Result in Greater Utilization of the Spectrum

Current cellular telephone companies have traditionally transmitted their signals in an analog format similar to that used by FM radio stations. PCS companies, on the other hand, plan to transmit signals in digital format, in which the original voice information is represented as a series of numbers. Digital signals can be compressed--that is, manipulated mathematically to reduce the amount of data needed to convey the original information. As a result, systems using digital transmission can handle more than 3 times the conversations carried on analog systems and may become even more efficient as technology advances. Many cellular companies are beginning to incorporate digital technology into

⁷Until January 1, 2000, cellular companies are prohibited from obtaining broadband PCS licenses of more than 10 megahertz of spectrum in the markets where they already have a certain percentage of the cellular holdings.

⁸There are 170 megahertz of spectrum in total that can be allocated to the cellular industry and the PCS industry after all of the auctions--50 megahertz to cellular and 120 megahertz to PCS. Since, ultimately, no one firm can maintain more than 40 megahertz in any market area, each area will be divided among at least five firms--for example, four firms could have the maximum of 40 megahertz, and a smaller provider could have 10 megahertz.

their networks. Wide-area SMR carriers are beginning to provide services using digital technology as well.

The use of digital technology by these mobile telecommunications companies is one of the most important factors affecting this industry in the coming years. Industry analysts have stated that this technological advance, along with the new spectrum for PCS, could move this industry from one that has faced some constraints on capacity--particularly in certain urban areas--to one that will have excess spectrum capacity, at least for some time.⁹

MOBILE TELECOMMUNICATIONS MARKETS ARE LIKELY TO BECOME MORE COMPETITIVE IN THE NEXT 2 TO 3 YEARS

On the basis of the new spectrum allocated to PCS, an increased ability to use the spectrum efficiently, and the number of firms expected to enter the mobile telecommunications markets, we believe these markets will likely become more competitive in the next several years. Our review suggests that PCS firms will enter the market soon and will provide services in direct competition to those of current cellular companies. This boost to competition, studies and analyses suggest, should provide consumers with more service options and lower prices.

PCS Providers Are Expected to Enter the Market in the Near Future and Provide Services in Direct Competition to the Cellular Industry

Before PCS firms can enter the market and begin providing services, they must do several things, including, for example, complete the development of their equipment and establish cell sites. Nevertheless, they have paid large sums of money for their licenses and have a strong financial incentive to enter the market as soon as possible. Many of the 10 PCS firms we spoke with told us that they will begin to offer service in 1996, and nearly all of them indicated that they would enter the market by some time in 1997. On the basis of our discussions with PCS firms and industry analysts, in just 1 to 2 years additional competition should be sufficient to influence the pricing of services, even though it may be many years before services are widely available.

PCS providers will likely bring to the market services identical to those provided by cellular companies. We were told by FCC engineers as well as by PCS companies that, despite the higher frequency range of the radio spectrum for PCS (as compared to that

⁹In some of the larger cities, cellular carriers have faced capacity problems wherein the number of people wanting to make calls at certain times of the day is more than the system can handle.

currently used by cellular companies), there are no technical problems for the new companies in providing cellular-like services--even in quickly moving cars. In time, both PCS and cellular companies will probably introduce other enhanced services as well, and some PCS companies told us that they expect their services to ultimately compete with traditional telephone service.

Another factor in the market will be the service offerings of Nextel and other wide-area SMR companies. A Nextel official told us that by the end of 1996, the company will have its digital network on-line in large portions of the United States. However, the services offered by Nextel and other wide-area SMR companies will still likely be geared toward dispatch users and, as such, may not provide general pricing pressure on incoming PCS or current cellular companies. Instead, the presence of wide-area SMR companies may only affect the pricing and services for certain kinds of business customers.

Mobile Telecommunications Market Could Become More Competitive for a Number of Reasons

For a variety of reasons, we believe that the entry of new mobile telecommunications providers should bring about lower prices in the industry. First, the number of firms in each market should be increasing from two to five or more when all PCS spectrum is allocated and firms have entered the market. In the next 1 to 2 years, the two PCS firms in each market area that have already been awarded the 30-megahertz licenses are likely to begin offering services to compete with the two cellular firms in each market area.

Some empirical evidence and analyses by others support the conclusion that the mobile telecommunications market will become more competitive as new firms enter the market:

- A recent study, for example, showed that when some cellular markets had only one provider (before the entry of the second carrier), prices were nearly 10 percent higher than in markets that had two companies.¹⁰ Since prices declined substantially when a second firm entered the market, this indicates that a third and fourth entrant may also cause prices to fall.
- Entry by personal communication network (PCN) firms (the British equivalent to PCS) in Britain's mobile telecommunications market has driven prices down. Like the United States, Britain had licensed two cellular companies

¹⁰William B. Shew, "Regulation, Competition, and Prices in the U.S. Cellular Telephone Industry," (June 1994). Mr. Shew is a visiting scholar at the American Enterprise Institute.

to provide services throughout the country. Two PCN providers entered the market, one in 1993 and the other in 1994, and, according to a British telecommunications consultant, offered services at prices as low as 40 percent below those of existing cellular firms. In response, cellular companies are designing new packages of service offerings that are aimed at attracting more price-sensitive consumers.

- Wall Street analysts predict that PCS firms will draw many of the new subscribers of wireless telephone service. For example, one investment firm's report that we reviewed predicted that by the year 2000, PCS providers will have over 16 percent of the mobile telecommunications subscribership and will be accounting for 43 percent of the new subscribers annually.¹¹ Stock analysts appear to believe that prices of cellular telephone service will decline because of PCS.

Despite the likelihood of greater competition due to additional firms, some industry analysts have expressed concern that the competitive impact of PCS will be mitigated by the fact that a set of firms--perhaps 8 to 10--will dominate the cellular and PCS market at the national level, and compete again and again with one another in many market areas. This "multimarket contact" has been fairly common in this industry. A related but perhaps more worrisome aspect of the industry is the "interlocking partnerships," wherein firms that are partners in one market are rivals in another. When firms have multimarket contact and interlocking partnerships, they may be in a position to have knowledge of one another's business conditions and strategies. Nevertheless, an increase in the number of firms within a given market is generally a more important influence on pricing than the business relationships across markets.

PROPOSAL BY RESELLERS IS UNLIKELY TO MAKE MOBILE TELECOMMUNICATIONS MARKETS MORE COMPETITIVE

An important component of the cellular concept is the mobile telephone switching office (MTSO), or the cellular switch. In wireline telephones, a switch is a set of computers that routes calls from their origin to their destination. The computers that constitute a cellular switch route calls as well but are also programmed to perform functions related to establishing the radio link that carries the signal to and from the mobile user. Throughout the duration of a call, the cellular switch also maintains the radio link by "handing off" the user's call from a

¹¹Donaldson, Lufkin and Jenrette Securities Corporation, The Wireless Communications Industry, Summer 1995.

radio channel in one cell to another radio channel in the next cell as the user moves between cells within an area.

Currently, all cellular users, including resellers, pay the cellular carriers for a bundle of services, which includes the use of the cellular carriers' switches. The reseller segment of the cellular industry has proposed that FCC require the two cellular carriers in each market area to allow resellers to interconnect their own switches with the cellular carriers' switches. This interconnection would enable the resellers to perform certain functions with their own switches, such as routing calls to the wireline system and generating information for billing purposes. Resellers would still need to purchase from the cellular carriers those switch functions that only the licensed cellular carriers are allowed to provide, including, for example, the establishment and maintenance of the radio link throughout the duration of a call. Although there are currently no federal rules against such interconnection, according to comments made in FCC's ongoing docket on resale issues, cellular carriers generally do not favor it. However, resellers contend that through switched resale, they would be able to provide more competitively priced services in the mobile telecommunications market.

While resellers' presence in telecommunications markets is beneficial, we noted in our previous report that, under traditional resale, resellers do not own cellular systems, and thus they do not compete with carriers on a wholesale level and are unlikely to provide lower prices, on average, in the market.¹² While, under the new proposal resellers would own switch facilities, they would still need to purchase some wholesale services, most notably those related to the use of the radio spectrum, from cellular carriers. As long as carriers maintain control over the price of those services, they effectively control resellers' retail rates. Therefore, it does not appear that resellers' ownership of switches will enable them to introduce additional competition in the market.

We are aware of recent events in California, where the Public Utility Commission has supported switched resale, that suggests that cellular carriers and resellers may have difficulty reaching agreement among themselves on wholesale rates for switched

¹²The most commonly cited benefit of resale is that it will frustrate a carrier's ability to exercise so-called "price discrimination." Price discrimination exists when a firm charges different consumers different prices for a product that costs the same to produce. Resellers should defeat a wholesale firm's ability to price discriminate because such pricing disparities will give the resellers an opportunity to profit by buying the service at a low price and selling it to those consumers charged high prices by the carrier. Thus, resellers help to keep price differentials across groups of consumers in check.

resellers. If industry is unable to agree on these rates for switched resale, a federal regulatory structure could be imposed, but such a policy would seem to be in conflict with the recent trend of emphasizing competition rather than regulation in telecommunications markets. Moreover, as we have stated, the mobile telecommunications market should, in any case, become more competitive in the near future owing to the entry of PCS firms.

SUMMARY

In summary, Mr. Chairman, the mobile telecommunications market has the potential to become more competitive in the near future. By taking an approach that emphasizes competition, the Congress and FCC are bringing beneficial changes to this industry. New PCS providers should enter the market within the next 2 years, and we are optimistic that as the market gains new providers, consumers are likely to see new service offerings and lower prices.

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Mr. Chairman, this concludes my prepared statement. I would be happy to answer any questions.