purposes or in limited geographical regions. For example, a paging service could be used in conjuction with a roadside payphone as a partial substitute for a cellular car phone. But such a substitute lacks the convenience features of cellular. Although ostensibly, cellular service may in limited instances be substitutable for landline telephone, pagers, or two-way mobile dispatch service, many analysts suggest these services are not generally close substitutes for cellular service, as reported by the U.S. General Accounting Office. (GAO REPORT)[3] Moreover, based upon the current deployment status of alternative PCS and ESMR technologies, as discussed below, we conclude that most consumers still lack good substitutes for cellular service on a widespread basis. Accordingly, we conclude that cellular service should be viewed as a separate market from other wireless telecommunications sources, at least for the present and near term future. The fact that we intend to devise a comprehensive framework for all forms of mobile service communications does not mean that we can ignore the distinctions among the various sectors of the market. Our conclusion is consistent with the March 7, 1994 FCC Order which focused on each of the various mobile services currently offered or about to be offered as a separate market.

Within the cellular market, there are several submarkets, with separate geographic boundaries, customer demand characteristics, and vendor technology capabilities. One significant cellular market trait is geographic boundaries. The geographic boundaries of each submarket are determined by the manner in which the FCC has regulated the licensing of mobile telecommunications service providers. As noted above, the FCC has

3 See July 1992 Report of U.S. General Accounting office "Concerns About Competition in the Cellular Telephone Industry," p. 21.

designated specific MSAs and RSAs within which licensees must limit their marketing. Each MSA and RSA constitutes a separate market with its differing demographic and geographic characteristics. Because of the large number of MSAs and RSAs within California, it would be unnecessarily time consuming and onerous to evaluate each one in great detail. Our concern is to reach broad conclusions that generally describe the various types of markets for mobile service communications within California. For purposes our analysis, we consider it sufficient to group cellular market areas generally into three major categories representing: (1) major metropolitan; (2) midsize; and (3) small market areas. We find that cellular markets exhibit different characteristics depending in large measure on which of these three categories they fall into.

Having developed this framework for defining the mobile services market, we shall proceed to analyze the extent of market power within the cellular market sector in the following section.

C. Competitiveness Within the Cellular Market

1. Dominant/Nondominant Framework

In the OII, we have characterized the FCC licensing of only two facilities-based cellular carriers as a "duopoly." We stated therein that limited competition results from the cellular duopolists exclusive FCC license to control this radio spectrum which we characterized as a "transmission bottleneck." A bottleneck generally exists where (a) an essential facility, product or service is controlled by one firm; (b) it would be economically infeasible for any other firm to duplicate the facility, product or service; and (c) access to that facility, product or service is necessary for other firms to compete successfully. The bottleneck results from the placement of control of radio spectrum in the hands of just two facilities-based carriers per market area. We have proposed to replace our current wholesale/retail regulatory structure with a framework for all

mobile telephone service providers which encompasses all carriers treatment solely based on a dominant/nondominant market classification.

Under our framework as proposed in the OII, a firm would be classified as "dominant" if it controlled important bottlenecks essential to providing mobile services to some or all of the public, i.e., it possesses significant market power. Dominant carriers would be subject to price cap controls and unbundling of radio links from other aspects of service, as set forth in Appendix B of the OII. We defer full consideration and implementation of these measures to a later phase of this proceeding, but address certain interim implementation measures in Section V of this decision.

All other wireless telecommunications providers would be classified as non-dominant. To the extent permissible by law, we would impose only minimal or no entry or price regulation. Nondominant carriers would be subject to an informational "registration" requirement, agreeing to be bound by minimum Commission safeguards to prevent and correct fraud or misleading information. As initially proposed in the OII, the Commission would grant nondominant status to any cellular license holder that demonstrates (through the application process) that it controls no more than 25% of the cellular bandwidth in a given market. We would entertain applications for nondominant status from cellular license holders which claim to control no more than 25% of <u>all</u> bandwidth, including noncellular assignments, used to provide public mobile telephone service within a geographic market. We stated in the OII that we would continue this classification treatment until we made a determination that competition exists to restrain the potential exercise of dominant carriers' market power.

a. **Positions of Parties**

The cellular carriers dispute the validity of the dominant/nondominant dichotomy posited in the OII, and contend there is no "bottleneck" controlled by the facilities-based carriers. Since two facilities-based carriers are licensed in each service area, no single carrier may dominate the market. If a carrier seeks to raise its rates to extract monopoly rents, the competitor can intervene by offering lower rates and drawing customers away from the competitor. Cellular carriers, such as McCaw, argue that the cellular spectrum is not an essential facility from a public standpoint, in the sense that local exchange or other bottlenecks clearly are. Furthermore, cellular spectrum is not controlled by a monopoly, like a local exchange company.

The cellular carriers also disagree with the Commission's proposal to define market dominance based on the percentage of total available spectrum. Fresno MSA, for example, argues that the amount of spectrum held is somewhat irrelevant to the competitive power of an ESMR provider such as Nextel. While Nextel would be classified as nondominant under the OII's proposed criterion, it would also be able to provide the largest, seamless 100% digital coverage in southern California. Given the expanded capacity offered by digital technology, Nextel's ability to sell its services would not be constrained by the amount of spectrum it controls. Fresno further argues that new market entrants who would be defined as nondominant would themselves control "bottlenecks" (defined as facilities-based networks) to the same same extent that current cellular carriers do.

While the retail customer may choose among a variety of cellular resellers, all resellers are captive to only two facilities-based cellular duopolists. Thus, on the wholesale level, the only substitute available to a given reseller is service from the other cellular duopolist. According to CRA, cellular

resellers are precluded from competing effectively with facilities-based carriers because of their lack of access to the MTSO and the ability to offer enhanced services such as voicemail. Alternative service providers also contend that cellular carriers' control over essential facilities will impede the development of market entry and penetration by new service providers.

DRA believes that the proportion of total available spectrum is only one among several measures of market dominance. Other relevant factors which DRA believes should be analyzed in assessing market power include relative market share, geographic factors, earnings, ownership of facilities by competitors, ease of market entry/exit, and relative size of competitors. DRA argues that the amount of spectrum held by any one provider is not as important as the government protection against competitive entry.

A November 1992 study of the FCC's Office of Policy and Plans[4] analyzed the cost structure of PCS systems to determine whether those systems were synergistic with the existing infrastructure of other telecommunications networks. The FCC study found that among various telecommunications networks, only cellular networks offered strong economies of scope in virtually all areas of PCS. Economies of scope exist between services when the costs of providing those services over one network is less than the combined cost of separate networks. Because of superior economies of scope, access to the cellular carrier infrastructure is the key to rapid build out of new PCS systems, according to CRA. The FCC study found that the fixed costs of a PCS network using very small radio cells are high in relation to the fixed costs of providing

4 See "Putting it All Together: The Cost Structure of Personal Communications Services" by David P. Reed, Office of Plans and Policy, FCC; Nov. 1992.

PCS using existing infrastructure especially at low levels of market penetration during early deployment.

MCI raises the concern that while existing cellular carriers possess the requisite market power and institutional relationships to assure access to interconnection on acceptable terms and conditions, the overwhelming majority of new mobile telecommunication service (MTS) providers possess no such advantages. CRA believes that the greatest obstacle to the build out of a new PCS system may well be the landline backhauls from the cell sites, particularly as PCS requires at least three times the number of cells for the same geographic coverage as cellular service. Without unbundling and interconnection, CRA contends that the new PCS and ESMR entrants will be severely hampered in constructing their systems.

CRA questions the theory that duopolists compete against each other, citing as an impediment the interlocking ownership relationships that pervade the duopoly market structure throughout California. Four large cellular firms affiliated with former Bell System companies and local exchange giant, GTE, collectively have formed interlocking alliances through which they compete against each other in some markets and are joint partners in others. A total of 16 MSAs are affected by interlocking ownership. For example, AT&T/McCaw Cellular Communications, Incorporated (McCaw) controls Sacramento Cellular Company which ostensibly competes with Airtouch (formerly PacTel) which controls Sacramento Valley Limited Partnership. Yet, in the San Francisco Bay Area, McCaw and and Airtouch are joint partners of Bay Area Cellular Telephone Company.

b. Discussion

By this decision, we conclude that in light of the current state of the mobile service industry competitiveness, facilities-based cellular licensees remain dominant. We acknowlege cellular carriers argument that, by definition, cellular

carriers do not form a monopolistic bottleneck since there are two firms--not one--in each MSA. But the carriers essentially are engaging in an argument over semantics. Technically, the bottleneck is duopolistic, not monopolistic. The presence of two carriers instead of only one may serve to mitigate, but does not eliminate, the existence of a bottleneck. The evidence of market power resulting from duopolists' control of the bottleneck in the form of uncompetitive prices and excessive profits is discussed below.

We believe the pattern of interlocking ownership among major carriers provides further evidence of their lack of price competition. As noted in the OII, these arrangements might result in the sharing of pricing information in joint marketing efforts or they might blunt incentives to compete.

Other evidence of cellular carriers' market dominance is seen in the relatively small and diminishing market share of resellers compared to cellular carriers. While resellers were originally expected to enhance competition at the retail level, resellers' market share has been dwindling in the major markets in California where they had earlier made some progress at the retail level early in the late 1980s. Resellers' loss of market share is caused by several factors, including their inability to control the majority of their costs which are determined by the duopolists who control the bottleneck facilities. By keeping wholesale rates high, the duopolists make it more difficult for resellers to earn a sufficient margin to compete for business with the duopolists. The margin spread between wholesale and retail rates in the major MSAs are set forth in Appendix 3.

In the Los Angeles (L.A.) and the San Francisco Bay Area (S.F.) MSAs, the two busiest MSAs, resellers' market share has on the average declined to half of its level five years ago. At the end of 1993, resellers in the two markets combined had a little less than 20% market share, down from 35% in 1989. Resellers lost

market share at the rate of 4% each year while the cellular carriers garnered greater shares of the market.

The Los Angeles market has become more concentrated in 1993 than in 1989. In 1989, the duopolies controlled 64.6% of the cellular market. In 1991, their control increased to 76.6% and by 1993, to 86.3%. In the San Francisco MSA, the two duopolies controlled 60.6% of the market in 1989. In 1991, their control increased to 66.8%, and by 1993, to 75.3%. In the San Diego MSA, the market share of the duopolies increased from 87.3% in 1989 to 93.5% in 1993.

In response to parties' comments as to the appropriateness of our measure of control of spectrum in classifying carriers as dominant, we agree that such a measure may not be as meaningful once alternative ESMR and PCS providers become prevalent in the marketplace. For the present, however, we do not believe such alternative providers possess sufficient market power to effectively challenge cellular carriers, as discussed in Section IV.C.2. We also agree with DRA that the amount of spectrum held by a given competitor is not as relevant as the government protection against competitive entry afforded by licensing restrictions.

Consistent with the comments of various parties, we recognize that the specific proportion of the cellular bandwidth or mobile service bandwidth controlled by a given carrier is not, of itself, a definitive criteria for distinguishing dominant from nondominant providers. As such, we will subsequently consider additional criteria as a basis for reclassification to nondominant status in a separate phase of this proceeding. We may consider further revising our definition of market dominance once we determine that alternative wireless providers have begun to make meaningful inroads as a competitive challenge to cellular.

Based upon our consideration of the various measures of market power as considered in the following sections of this interim order, however, we conclude that cellular carriers clearly

qualify as dominant within our definition as used in Appendix B of the OII.

Because of the presence of bottleneck facilities, we conclude that it is essential that interconnection arrangements with landline Local Exchange Carrier (LEC) networks be instituted for all providers of wireless service to promote a competitive market. Our conclusion is consistent with FCC's findings as expressed in its recent Second Report and Order on regulation of wireless services. Therein, the FCC recognized that:

> "We believe that commercial mobile radio service interconnection with the public switched network will be an essential component in the successful establishment and growth of CMRS offering... From a competitive perspective, the LEC's provision of interconnection to CMRS licensees at reasonable rates, and on reasonable terms and conditions, will ensure that commercial mobile radio service affiliates do not receive any unfair competitive advantage over other providers in the CMRS marketplace." (P. 89.)

We discuss in Section V our adopted interim procedures to promote interconnection of facilities.

2. Potential for Market Substitutes Other than Cellular Service

In terms of significant substitutes for cellular, the real candidates are newly emerging telecommunications services such as PCS and ESMR. The FCC defines PCS "as a family of mobile or portable radio communications services that could provide services to individuals or business and be integrated with a variety of competing networks." ESMR enhances the traditional functions of the dispatch-type specialized mobile radio services. ESMR employs existing spectrum allocations to provide cellular or cellular-like services in radio frequencies in the 800-900 Mhz band.

Parties were in significant dispute over the likely timetable for commercial deployment of PCS. Cellular carriers

believe that PCS technologies will be developed rapidly to become a viable competitor with cellular carriers.

The cellular carriers point to newly emerging competitors such as Nextel which will offer ESMR service and PCS providers as evidence that cellular carriers can no longer be viewed as duopolists--even assuming this was a correct label before. As such, the cellular carriers contend that the impending entry of PCS and ESMR providers will effectively put an end to the alleged duopoly bottleneck since the new providers will control separate facilities and spectrum. The FCC's broadband PCS licensing order requires licensees to "offer service to one-third of the population in each market area within five years, two-thirds within seven years, and 90% within 10 years of being licensed. The FCC plans to auction 2500 broadband and 5000 narrowband PCS licenses, with between three and seven licensees per territory. The FCC has awarded a "Pioneer's Preference" license to Cox Enterprises, Inc. (Cox) for 30 MHz of PCS spectrum in southern California and Nevada, with a 20 million population.

According to resellers and DRA, PCS providers will not be able to pose a viable competitive threat to cellular carriers for five or more years because of various hurdles that PCS providers must first overcome. First is the completion of the bidding process for broadband PCS which will likely be delayed until late summer or early fall. The delay is due to more than 60 petitions filed with the FCC and the need to "work out the bugs" in the auction process in the narrowband before moving on to the broadband licensing. Another problem is spectrum congestion. The 2 GHz frequencies allocated for PCS are currently used by microwave systems. PCS users must pay the cost of negotiating with incumbent microwave users to relocate to other frequency bands. The FCC's Office of Engineering and Technology estimates a nationwide cost of $2.7 billion for moving microwave users.

There is also uncertainty over the selection of PCS technology and the timing of its deployment. PCS infrastructure investment is projected to cost $15-45 billion compared with $9 billion already invested in cellular. Also, the PCS technology is untested. Industry debate continues over the preferred technology. After a technology is chosen, it will take at least a year to test and develop the PCS network. PCS providers will then have to design their systems so they can apply for construction permits. Equipment must then be procured, but present manufacturing capabilities for PCS equipment are very limited. The Personal Communication Industry estimates that PCS will only have a 3.1% penetration of the market by 1998. The FCC has proposed to require PCS licensees to offer service only to one-third of the population in a market within the first five years of the license.

Moreover, the propagation characteristics and penetration capabilities of the 2 GHz bands assigned to PCS are inferior to the 800 MHz band where cellular operates. PCS requires more cell cites and landline backhauls which increases the PCS cost relative to cellular.

MCI notes the recent pronouncements by the FCC indicating that further probable delay will occur in the potential roll-out of PCS services. FCC officials have recently indicated that major auctions for awarding PCS licenses will not take place until late 1994 or early 1995. The FCC has delayed its final consideration of specific arrangements to govern the PCS auction process such as terms under which companies may bid for a nationwide collection of frequencies.[5]

Respondents also offered comments as to the impact of PCS and ESMR market entry on mitigating the market share concentration

5 "FCC Discloses Rules on Auction of Airwaves" New York Times, March 9, 1994, p. D-2.

presently held by cellular providers. Under the DOJ Guidelines, market concentration is frequently measured using the Herfindahl-Hirschmann Index (HHI). The DOJ Merger Guidelines indicate that HHI values falling between 1000 and 1800 reflect a moderately concentrated market.[6]

In their comments, CCAC presented a study of HHI market share concentration prepared by Charles River Associates based upon values under four market configuration assumptions (reference: Tables K-N of CCAC Comments). These four scenarios assumed: (1) Two cellular and seven PCS providers; (2) two cellular, seven PCS and one Specialized Mobile Radio (SMR) providers; (3) two cellular carriers with PCS licenses and five PCS providers; and (4) two cellular carriers with PCS licenses, five PCS providers and one SMR provider. The Charles River Study found only moderate concentration in a range between 1220 to 1626 among the four scenarios.

DRA disputes the validity of the Charles River HHI values which assume the market will divide according to spectrum allocations and which fail to reflect the current market share of existing carriers or the service limitations of the competing technologies. CRA computes revised HHI values using the January 1994 forecast of market shares of the Personal Communications Industry Association (PCIA). According to the PCIA forecast, PCS will have only a 3.1% market penetration by 1998 compared with a 12% penetration for cellular. Even by 2003, while PCS is predicted to have a 10.4% market penetration, cellular is expected to have grown to 17.4%.

6 The HHI equals the sum of the square of the market shares of the respective competitors in a given market.

For purposes of computing HHI indices, CRA assumes two hypothetical market scenarios: (1) maximum market concentration allowed by the FCC occurs (40 MHz per competitor), and only one satellite and one ESMR competitor exist; and (2) minimum concentration occurs in which the PCS licenses are as distributed as possible under FCC spectrum allocation rules, with three ESMR competitors. The market shares for the respective PCS competitors are distributed according to the spectrum allocations authorized by the FCC. The market shares for the other technologies are distributed evenly among the assumed competitors. With these assumptions applied to the PCIA market penetration forecasts, CRA computes the following HHI forecasts:

Scenario	1998 Forecast HHI	2003 Forecast HHI
Max. Concentration	2771	2160
Min. Concentration	2463	1704

CRA notes that under the DOJ Merger Guidelines, HHIs over 1800 are considered to reflect "highly concentrated" markets, and that any merger that increases an HHI in this range by more than 100 points is likely to create or enhance the market power of the competitors. CRA's HHIs fall well above the "highly concentrated" floor. By 1998, the cellular carriers are expected to retain control over 68.7% of the total mobile telephone market. CRA concludes that such market power will permit cellular carriers to remain dominant price leaders. Thus, according to CRA, even to the extent the technical, institutional, and regulatory hurdles confronting the emerging PCS/ESMR industry can be somewhat overcome, the mobile telephone market will continue to be highly concentrated, with two cellular duopoly carriers maintaining a dominant position for at least five years.

Discussion

The question of whether the newly emerging technologies can presently be considered as viable competition for cellular

depends on the speed with which these technologies are expected to become commercial on a broad scale, as we review below. We agree that alternative technologies such as PCS and ESMR have the potential to ultimately become close substitutes for a large number of cellular customers on a widely available basis in the future. Such widespread substitutabilty is not currently a reality, however. We conclude that, at present, alternative wireless technologies must overcome the various impediments enumerated above before they can constitute viable substitutes for cellular service. As such, it is premature to expand the definition of today's cellular market to include these new technologies, except as marginal influences in certain limited areas. While we believe it is only a matter of time before these new providers overcome market obstacles to become viable competitors, it would be irresponsible to abdicate our regulatory oversight before those competitive forces are in place. We consider below the various constraints leading us to this conclusion.

As noted above, one of the emerging contenders in the wireless communications market is PCS. The FCC has recently opened up the potential entry of this market through allocation of 160 MHz of radio spectrum for PCS, subdivided into 120 MHz of licensed spectrum and 40 MHz of unlicensed spectrum. The FCC established eligibility for PSC spectrum allocation through a bidding auction that was originally to begin in May 1994 for narrowband PCS. As noted by GTE, it was intended initially that PCS systems would have no call-receiving capability and limited ability to handle movement across cell sites during a call. As now contemplated, at least some digital PCS systems will have these capabilities and thus be fully competitive with cellular.

The geographic extent of a typical mobile service market will likely expand in the future as new technologies are licensed and begin competing with cellular service. The FCC has designated much broader service territory boundaries for PCS providers

relative to cellular providers, using Rand McNally "Major Trade Areas" (MTAs) as market boundaries.

Another constraint involves the ability of alternative providers to shift their resources from one use to another to supply service in competition with another provider.

At present, only one firm within California, Nextel, is positioned to begin to offer ESMR service beginning this year. On February 13, 1991, the FCC authorized Nextel to construct and operate ESMR systems in major US cities. Nextel began testing ESMR service in Los Angeles in August 1993 and now operates a Digital Mobile Network covering about 18,000 square miles in Los Angeles. Nextel anticipates completing its testing in the second quarter of 1994. Nextel has acquired 2500 SMR radio frequencies from Motorola. MCI has recently invested $1.3 billion in Nextel. Nextel expects to eventually compete with existing wireless services, including cellular licensees. Presently, there are only 500 ESMR California subscribers, all in the LA area. Thus, at the present time, ESMR is a viable market alternative to cellular service only for a limited number of customers in the LA area. In other MSAs outside of LA, ESMR is not even available. With consolidation of ESMR licenses, firms can acquire sufficient bandwidth to offer new services and compete in larger markets in the future. As stated by Fresno MSA, Nextel is positioning itself to become a one-stop provider for all-around communications, integrating cellular, paging, voicemail, textmessaging, and two-way radio into one piece of equipment. Fresno also notes that since Nextel is not subject to an FCC-mandated build-out requirement, it can concentrate on the more lucrative high usage areas initially and widen its coverage later. This provides Nextel a competitive advantage that was not available in the initial phases of the cellular industry.

As noted by Cellular Services, Inc. (CSI), ESMR providers are presently using their existing spectrum licenses for dispatch

and paging services. While digital technology enhances the utilization of the spectrum, it does not guarantee a major expansion of competition for cellular. Nextel's substantial construction costs will constrain it from offering rates that exert competitive pressure on cellular carriers.

As noted in the OII, until SMR providers are actually operational, the extent of direct competition to existing entrenched cellular providers who enjoy the use of substantial bandwidth in comparison to SMRs is unknown. In this OII, however, we consider the impact of their presence or potential entry on traditional wholesale cellular service prices. We also consider whether the arrival of effective competition will be expedited with regulatory safeguards geared at encouraging the development of a competitive market.

We also note that the FCC, itself, has recently concluded that current ESMR, SMR and potential PCS licensees possess no market power with which to impede competition for some time, because of cost and marketing constraints. (FCC Order, pp. 58-60.)

Even as ESMR and PCS providers progressively penetrate the mobile telecommunications markets within California, the industry estimates indicate that market share will remain concentrated in the hands of cellular carriers at least for the next few years. The high HHI market concentration estimates for cellular carriers computed by CRA support this view. We find CRA's HHI values, which are based upon actual industry estimates, more reliable than those of CCAC, which assume merely that the market share is allocated in proportion to the amount of spectrum held.

In summary, we conclude that cellular carriers are likely to retain significant market concentration for at least the next few years, particularly given PCIA industry forecasts of limited market penetration by PCS and SMR providers, as noted above. Given the limited availability and substitutability of alternatives to cellular during at least the near term, we must view the

cellular carriers as operating largely free of competitive challenges within the current mobile services industry. As stated above, under FCC licensing rules, only two facilities-based carriers may conduct business in any designated MSA. This market-entry restriction creates a duopoly market with respect to the cellular wholesale industry. Accordingly, an analysis of market concentration and availability of substitutes supports the conclusion that cellular carriers are not subject to significant competition in the majority of market sectors served at the present nor will they be in the near future.

3. Cellular Prices as Evidence of Market Competitiveness

A primary inquiry of this OII is whether cellular prices are unjust, unreasonable, or discriminatory, reflecting concentration of market power and lack of competitiveness. Respondents dispute whether cellular rates are uncompetitive and what inferences to draw from cellular price data as an indicator of competitive behavior.

As a basis for evaluating cellular pricing data, we are primarily interested in wholesale prices. It is primarily at the wholesale level where market power is concentrated in the hands of just two facilities-based duopolists, and where the potential to extract rents above competitive levels is most acute. In our analysis of prices, we also recognize the proliferation in recent years of various promotional contract plans which purport to offer savings to certain targeted customer segments. These plans usually require eligible customers to meet various restrictions and conditions as contrasted with traditional "basic service" which may entail a higher nominal rate but which do not impose the restrictions of the discounted plans.

a. Positions of Parties

Parties representing consumer groups, resellers, and alternative providers argue that cellular rates are too high, and

do not reflect a competitive market. They point to the fact that the rates for basic service charged by duopolists in major California metropolitan markets are identical and have remained unchanged for years while the cost of cellular equipment components has declined significantly. CSI presents a study of the National Cellular Resellers' Association dated January 24, 1994 which ranks cellular service prices in the 30 largest U.S. markets and compares 1988 versus 1994 prices in each market, based on the best rates available for 30 minutes of monthly airtime. The National Cellular Resellers Association (NCRA) study shows that the LA market was the second highest-priced cellular market in the nation, and that rates had not changed since 1988. The San Francisco market was the seventh most expensive, although the reported rates had been reduced about 20% since 1988.

As noted in testimony of DRA before the Senate Committee on Energy and Public Utilities (January 1993), basic cellular service rates in the two largest markets in California were identical between each set of duopolists and were also among the highest in the country based on a comparison with 8 other major cellular markets. (See Appendix 2.)

Nationwide Cellular (a reseller) provided the research study of economist Thomas Hazlett which concluded that cellular duopolists do not set competitive prices. As explained by Dr. Hazlett, traditional economic theory underlying duopoly pricing holds that when only two firms compete, prices will fall somewhere between the extremes of monopoly rents on the high side and full competition on the low side. While duopolists could jointly maximize profits at a monopoly price level, each has an incentive to slightly undercut the other firm and to garner a larger market share. According to Dr. Hazlett, both firms iteratively react to each other's attempts to gain market share by reducing prices. Finally, in equilibrium, both firms set identical levels of prices with no tendency to change. With only two firms competing, this

equilibrium price is reached at a level in excess of the duopolists' marginal cost. This price point is known as a "Cournot equilibrium." Under these assumptions, as additional firms are allowed to enter the market, new competitive pressures will force prices downward until prices just cover marginal costs. Finally, competitive prices result in equilibrium.

In response to an ALJ ruling dated April 11, 1994, Nationwide supplemented its filing with an additional paper authored by John Haring and Charles Jackson (Haring and Jackson), which disputed the findings of Hazlett. In their critique of Hazlett, Haring and Jackson dismiss Hazlett's recitation of duopoly pricing theory as having no basis in fact. They cite a contrary academic opinion that there is no definitive pricing theory that can determine whether empirical pricing data reflects competitive conditions or not. They argue that the variant of the Cournot model put forward by Hazlett is generally held in low regard by economists because it is purely a mechanical construct and has no grounding in economic behavior by individual agents.

Others, such as GTE Mobilnet, argue that economic theory supports the conclusion that the cellular marketplace will be competitive even with only two participants. While earlier economic models assumed that duopolists would hold prices constant and control output to maximize profit, subsequent theory assumes that a cellular duopolist would adjust price rather than output to maximize profit, according to GTE. Moreover, GTE argues that cellular providers are motivated to maximize the amount of traffic on their systems in order to maximize revenue. The theory underlying later economic models holds that providers will eventually drop prices to marginal cost because demand for cellular is elastic at lower price levels. The cellular carrier thus presumably has an incentive to expand output (through cell-site sectoring, construction of additional cell sites, and digital conversion) in order to expand its revenue base.

Cellular carriers also argue it is a misconception that cellular prices have not fallen. While rates for traditional "standard" or "basic" service have not been reduced in some of the largest markets, the carriers contend that most subscribers now receive service under non-standard discounted rate plans. Cellular carriers assert these additional service plan options increase consumer choice and result from competition. Moreover, cellular carriers contend that they compete on the basis of service quality as well as price, and that customer satisfaction is an important measure of the success of competition.

Various cellular carriers presented price data in their filed comments intended to show that prices have declined in real terms over time. A consolidated study of cellular prices of various carriers was offered by CCAC. CCAC's study covered the years 1990-93 and segmented customer usage into three typical calling volume levels examined separately for large, medium and small markets in California. The study compares the average cost per minute of service over time based upon the lowest effective rate available at a given number of minutes of usage. CCAC claims rate decreases between 1990-93 as follows:

Market size	Rate Decrease
Large	18.5%-20.8%
Medium	24.3%-30.2%
Small	12.3%-17.2%

CCAC notes that over time a steadily increasing number of customers have continued to move to discounted rate plans from relatively higher basic service. CCAC attributes this downward trend to existing competition in the cellular industry and argues that strict rate regulation will not improve this trend. CCAC also provides a comparison of the rates charged by competing carriers in a number of major California markets (Table A-Reply Comments) to argue that competitors do not charge equivalent prices except in LA, and then only for basic service.

GTE likewise argues that focus on basic rate plan charges biases any assessment of price competition among cellular providers not only because of the proliferation of special discount plans, but because service quality improvements have been substantial.

LACTC presented price data showing reductions in retail prices as well in wholesale prices charged resellers. Bay Area Cellular Telephone Company (BACTC) states that average revenue per subscriber has declined 30% since 1990, with only a slight reduction in the price per minute of usage. Between 1990 and 1993, the number of alternative service plans offered by BACTC has increased from two to 15 while the percentage of customers under its Basic Plan has declined from 79% to 41%.

US West reports that since 1988, its average airtime rates for wholesale customers have declined 19.5% and for retail customers have declined 8.9%. Its average retail access charge has declined 0.8% since 1988 while its average wholesale access charge has declined 39%. Basic service charges have also declined since 1990 by 12% for retail and 8.23% for wholesale customers, typically. US West emphasizes that the greatest decreases have occurred on the wholesale side--the area about which the Commission has expressed the greatest concern.

Other parties such as DRA and CRA challenge the significance of such alleged savings. Even if the calculations are valid, DRA/CRA point out that not all retail customers receive service under the most optimal billing plan. The study fails to address the comparison of rates under undiscounted basic service plans. Moreover, the CCAC study focuses solely on retail prices while ignoring wholesale price comparisons. According to CRA, wholesale prices have not been reduced, thus indicating an absence of wholesale competition.

Parties expressed divergent views on the question of whether rate regulation has been part of the problem or part of the solution when it comes to high cellular rates. To the extent cellular prices have not dropped as rapidly as they would in a

fully competitive market, the cellular carriers argue that it is regulation--not an uncompetitive marketplace--that has been to blame.

The comments of GTE are typical of the carriers' view that our existing regulatory structure does little or nothing to promote competition. GTE believes the only way that rate regulation can promote competition is by restraining a firm with market power from driving its competitors out of business by artificially depressing its prices. Yet, the existing regulatory structure was not designed to protect against artificially low prices in GTE's view. GTE complains that current regulatory constraints on what a carrier can offer its customers has served to chill competition. In GTE's view, to the extent the Commission maintains tariff rules requiring advance notice of new service offerings and promotions, disincentives to innovation and competition result.

GTE also contends that the need for regulatory oversight in California is no different than in other states. In other states, GTE notes that the trend has been to reduce regulatory oversight, not increase it. Only 11 states require that retail and wholesale tariffs be on file at the regulatory agency.

McCaw previously compared representative rates of California cellular carriers with those of carriers in other states which are not regulated in testimony at a State Senate Committee hearing on cellular rates. McCaw reported that cellular bills of subscribers in unregulated states were 10%-50% lower than cellular bills in the Los Angeles/San Francisco areas.

Regarding the McCaw study comparing rates of cellular carriers in unregulated states with those in California, DRA did its own separate analysis and offered contrary findings to the State Senate Committee. DRA concluded there was no clear link between a state's rates and its level of regulation. DRA found that although the Sacramento market was subject to the same regulation as that of Los Angeles/San Francisco, its rates were considerably lower than other unregulated markets.

A separate 1992 GAO study surveyed cellular retail price data from 1985-1991 in the 30 largest U.S. retail markets. The GAO study found that, on average, cellular prices in the four largest California cellular markets were about 31% above those of other U.S. markets. Moreover, the average price difference varied by no more than about 3% between the two carriers in these markets.

LACTC reviews its own history of advice letter filings for rate reductions as a case in point of its sensitivity to regulatory restraints. During the initial period of cellular rate regulation prior to D.90-06-025, LA Cellular filed an average of about four rate reductions or promotions per year. Between D.90-06-025 and D.93-04-058, LA Cellular filed about 20 such advice letters per year. Once D.93-04-058 introduced Rateband Guidelines allowing rate reductions to become effective immediately, LA Cellular has filed the equivalent of 41 advice letters on an annualized basis. LA Cellular infers that cellular rates should fall even more if the remaining procedural barriers to rate reductions are removed.

b. **Discussion**

While we agree that observation of prices in isolation does not prove conclusively whether or not a firm or industry is competitive, such price data is a relevant criterion of market power when viewed in conjuction with other indicators. Based upon our review of cellular price patterns as compiled in connection with this OII, we conclude that cellular prices still remain higher than would be expected in a fully competitive market, notwithstanding cellular carriers' claims to the contrary. Our conclusion is consistent with the 1992 study of the cellular industry conducted by the US General Accounting Office which found that: "A market with only two producers--a duopoly market--is unlikely to have a competitively set price that is at or near the cost of producing the good." The GAO observed that many economists believe anticompetitive behavior is more likely to occur in industries with barriers to entry, such as cellular.

In interpreting price comparisons, we recognize that a variety of factors contribute to the comparatively higher rates, particularly in major metropolitan California cellular markets. As noted by DRA, those factors include high demand for cellular services, greater disposable income in the areas with the highest rates, greater population density, and a highly mobile population.[7] We agree with DRA that in addition to these factors, the lack of competition is a significant factor in explaining the high rates. In addition, most duopolists' prices for their basic service are very close to each other if not identical. The similar price levels of duopoly carriers for basic service raise questions as to price competitiveness. The tendency of duopolists to price their services equal or close to each other is corroborated by the 1992 GAO study of cellular prices. The study analyzed prices from 1985 to 1991 in the top 30 US cellular markets, based upon the best available price for 150 minutes of usage. The study found that duopolists set their best prices within 10% of each other in two-thirds of the markets.

Granted, we observed in D.90-06-025 that: "[i]n a fully competitive market, the prices of individual firms track closely and may even be identical." (P. 49.) Yet, while similar prices may be observed in competitive markets, we cannot assume that similar prices always indicate a competitive market. Particularly, in an industry with restricted entry, high demand, and declining equipment costs such as cellular, similarity of prices between two duopolists raise questions. For example, why haven't rates been bid down if, in fact, costs have dropped and competition exists? In California, the original rates -- largely basic rates for most carriers -- were set on what the market could bear at the time; that essentially meant rates were based on carriers' own projections. Rate of return and the actual cost of

7 See DRA letter to Senator Hershel Rosenthal as included in Attachment C of DRA Opening Comments.

providing cellular service were not seriously considered. The basic rates have been largely untouched since then. In the interests of maximizing profits, carriers had the incentive to set high initial basic prices. Because the cellular market was relatively new at the time we adopted a hands-off approach to regulating their rates, hoping the rates would come down in due time as economies of scale occurred and the cost of doing business declined (due to declining equipment prices and so on). In fact, as noted in the comments of CSI, while basic service charges have remained basically flat, the average cost of a cellular telephone has dropped from about $2,400 in 1983 to about $200 today, which equates to a monthly cellular cost drop from $79 to $7.[8] In terms of the total capital investment per cellular subscriber, the average industry cost of $1,816 in June 1988 dropped to only $978 by June 1993.[9] We find the disparity between declining costs versus flat prices for basic cellular service to be further evidence of an uncompetitive market.

Prior to this current investigation, we recognized that cellular rates within California were too high. In our investigation of the cellular industry in I.88-11-040, we intended to adopt measures as prescribed in D.92-10-026 in response to concerns over excessive rates (although we subsequently stayed those measures pending the outcome of this proceeding). Concern over high, uncompetitive cellular rates led the California Senate Committee on Energy and Public Utilities to hold a legislative hearing on January 12, 1993 on how the cellular industry should be regulated. On March 25, 1993, President Fessler stated in an Assigned Commissioner Ruling: "Cellular subscribers in California

8 The Cellular Service Industry: Performance and Competition, Charles River Associations, January 1993, as cited in Opening Comments of Cellular Service, Inc.

9 CTIA Mid-Year Data Survey, October 12, 1993 as cited in Attachment 3 footnote 4 of the CSI Opening Comments.