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May 25, 1994

Building The Wireless Future™

CTIA

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MAY 25 1994

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

Re: *Ex Parte* Presentation
GEN Docket No. 90-314

Dear Mr. Caton:

This afternoon, the Cellular Telecommunications Industry Association (CTIA) Small Operators Caucus met with Commissioners Rachelle B. Chong and Susan Ness. Accompanying Commissioner Chong were her Senior Advisor, Jane E. Mago, and Legal Advisor, Richard K. Welch. Accompanying Commissioner Ness were her Interim Advisors Gregory J. Vogt and Rosiland Allen. In a separate meeting, representatives of the CTIA Small Operators Caucus also met with Karen Brinkmann, Special Assistant to Chairman Hundt, and Donald Gips, Deputy Chief, Office of Plans and Policy. Representing the CTIA Small Operators Caucus were Robert F. Broz, President of RFB Cellular, Inc.; Michael E. Kalogris, President and CEO, Horizon Cellular Telephone Company; Alex Gellman, Director of Acquisitions, Horizon Cellular; Gerald S. McGowan, President, Steel Valley Cellular; Thomas E. Wheeler and Randall S. Coleman of CTIA. The substance of the matters discussed, as summarized in the attached presentation materials, reflect CTIA's position as previously filed in this docket.

Copies of the attached briefing binder on Broadband PCS were also served on Commissioner Andrew Barrett; Mr. Byron Marchant, Senior Legal Advisor to Commissioner Barrett; and Dr. Robert Pepper, Chief of the Office of Plans and Policy.

Pursuant to Section 1.1206(a)(1) of the Commission's Rules, an original and one copy of this letter and the attachment are being filed with your office.

If you have any questions concerning this submission, please contact the undersigned.

Sincerely,

Michael Altschul

Michael F. Altschul

Attachment

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PCS MATERIALS ON BROADBAND PCS

Cellular Telecommunications Industry Association
May 25, 1994

Briefing Binder on Broadband PCS

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April 13, 1994

Chairman Reed Hundt
Federal Communications Commission
1919 M Street, N.W. Room 814
Washington, D.C. 20554

Re: Ex Parte Filing
GEN Docket No. 90-314
Personal Communications Services

Dear Chairman Hundt:

In light of recent interest in information on Personal Communications Services (PCS) demand, and related issues, I enclose a report prepared for the Cellular Telecommunications Industry Association ("CTIA") entitled *PCS Predictions and Perspectives: Highlights of 32 Studies and Reports On Prospects for PCS.*

This report reviews a representative sampling of studies and predictions about the wireless industry, derived from analysts, consultants, and would-be PCS providers.

The report reveals that both ***analysts and would-be providers practically speak with a single voice when they urge the Commission to act with dispatch*** in resolving outstanding issues and licensing the PCS spectrum.

The report also makes it clear that ***PCS is many different things to many different people.*** It is in light of these different visions of PCS that different results are predicted and different recommendations made.

In going forward, the Commission should be mindful of this fact, and adhere to its own considered decision to define PCS broadly, leaving it to the marketplace to validate the ultimate results.

If there are any questions in this regard, please contact the undersigned.

Sincerely,

Robert F. Roche
Director for Research

Enclosure

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

PCS Predictions and Prescriptions:

Highlights from 32 Studies and Reports On the Prospects for PCS

by

Robert F. Roche

Director for Research,

Cellular Telecommunications Industry Association

This report summarizes a representative sampling of studies and predictions about the wireless industry, ranging from definitions of personal communications services (PCS), through market-size and market-share predictions, to observations about the bases for wireless competition.

These studies and the parties to the proceeding practically ***speak with a single voice when they urge the Commission to act with dispatch*** in order to avoid an unwarranted and debilitating delay in submitting the various visions of PCS to the true and final judge -- the user.

It is equally clear from these studies that ***PCS is many different things to many different people***. Thus, definitions of success, and recommendations of what the proper predicates are for those results, vary from case to case.

The Commission has rightly exercised a healthy agnosticism over what PCS may be, in adopting its broad and flexible definition of the term. It should not undermine that considered approach, nor the prospective viability and vitality of that industry, by trying to impose through regulation a singular vision of PCS.

The Wireless Study Round-Up: Comparing Expectations and Predictions

This report draws upon consultant, analyst and service provider studies in order to address the following questions and issues:

The studies, public statements and reports which are the basis of this chapter describe the relationship between wireless services, including cellular, personal communications services (PCS), enhanced specialized mobile radio (ESMR), paging and other wireless services. Some of these reports include revenue and subscriber projections over the next decade. The results of various PCS trials are incorporated where they address the issues listed below, and are abstracted in the appendix to this chapter. ***CTIA's analysis and commentary on each section is bolded and italicized in order to provide for ease of reference.***

How Do You Define PCS?

PCS is a fluid term. The Federal Communication Commission (FCC) -- exercising a healthy agnosticism -- has declared that it is "radio communications that encompass mobile and ancillary fixed communication services that provide services to individuals and businesses and can be integrated with a variety of competing networks."[1]

Many analysts and providers have likewise exercised a healthy flexibility in defining PCS, defining the term broadly. Of course, fine distinctions may yet be drawn in the marketplace -- but that will be done on the basis of customer and provider applications and relationships.

What is most important is recognizing that the vision of PCS held by any one analyst or provider must be and will be subordinated to the judgment of the consumer, who may make no such fine distinctions between the underlying cellular, ESMR, paging, PCS, or specialized mobile radio (SMR) provider.

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[1] *Second Report and Order, Amendment of the Commission's Rules to Establish New Personal Communications Services*, GEN Docket No. 90-314, 8 FCC Rcd. 7700 at 7713 paragraph 24. (October 22, 1993).

As John T. Stupka, President and CEO of Southwestern Bell Mobile Systems (SWB Mobile Systems) has observed: "The person who desires wireless service wants to be able to place and receive calls anytime, anywhere, with reasonable cost and with acceptable quality. For the most part, these people tend to have little concern about the underlying complexities of the technology."[2] In fact, they are probably equally indifferent as to *what* company provides the service, whether it is one which used to be called a cable, cellular, ESMR, "local phone," "long distance," paging, or SMR company. What the consumer is interested in is service.

Admittedly, different analysts see demand for PCS developing differently -- for example, differing over whether it will initially develop as a business or consumer market. That question, and the viability of the market plans which would-be providers have developed, will be ultimately tested by the actual operations of the market.

Cowen & Company

A report issued by Geoffrey Johnson, of Cowen & Company, in January 1993, on "Industry Strategies, Wireless Communications Industry," observed that the vision of PCS held by various players depended upon their competitive position.

> For the cellular industry, cellular is PCN, and the key issue is interoperability. For the local exchange carriers, PCN is an adjunct to the network, and the key issue is integration. For the interexchange long distance carriers, PCN is bypass for the local loop, and the key issue is local access. For new market entrants, PCN is competition to cellular and landline service, and the key issue is cost.[3]

The Freedonia Group

The Freedonia Group, in its study "Wireless Phones," projects that "PCS will initially be targeted at business/professional users, whose need for the type of high-level integrated voice/data communications capability PCS offers is greatest. By early in the next century, however, as the subscriber base expands and equipment prices and service costs decline, a substantial consumer market for PCS will emerge, attracted by the services' convenience, economy and safety/security advantages."[4]

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[2]"Tracking the Pervasive Wireless Communications Technologies of the Future," *Wireless Communications Forum,* March 1994, at p.32.

[3]"Industry Strategies, Wireless Communications Industry," Quoted in "Players and Promises in PCS," *Business Communications Review,* April 1993.

[4]"Wireless Phones," *Wireless Communications Forum,* March 1994, at p.82.

Grantchester Securities

This may also be contrasted with the definition offered by Richard Bilotti and Drew Hanson of Grantchester Securities:

> We view . . . PCS as wireless communications in the "subscriber's environment of the moment," be it in the home, the office, a shopping center, airport, post office or sports arena -- in short -- universal coverage. We have assumed that PCS will work under a pedestrian mobility scenario though vehicular mobility will be possible with modification to the network. Either type of portability means a personal telephone unit that is quite compact, lightweight, and with sufficient technical capabilities to operate over the envisioned wireless environment. . . . Within this broad landscape, cable operators may choose to play a variety of roles in the provision of PCS services.[5]

PCIA

The Personal Communications Industry Association's (PCIA) *1994 PCS Market Demand Forecast* defines PCS "as a broad range of individualized telecommunications services that enable people or devices to communicate independent of location."[6]

SWB Mobile

John T. Stupka, President & CEO of Southwestern Bell Mobile Systems, has said that PCS services are "nothing more than cellular services offered on a different frequency."[7]

Technology Futures Inc.

Ralph Lenz, senior consultant at Technology Futures, was quoted in *Cellular Sales & Marketing* as dismissing distinctions between PCS and cellular: "What's the difference between cellular and PCN/PCS? Users don't care. To the user, personal communications is a small, lightweight handset. The user could care less about the network technology as long as it delivers tetherless service at a reasonable price.'"[8]

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[5]"The Cable Approach to the PCS Landscape," *Wireless Communications Forum,* December 1993, at p.53.

[6]*PCIA Bulletin,* February 4, 1994, at pp.6-7.

[7] Paul Shultz, "Is There Really a Significant Difference Between Broadband PCS and Cellular Technology?" *TR Wireless News,* December 2, 1993, at pp.16-17.

[8]*Cellular Sales & Marketing,* November 1993, at p.7.

U S WEST NewVector

John DeFeo of U S WEST NewVector Group describes PCS as "a personal voice and data communication that will be inexpensive, provide portability and weeks of battery life with a small, easy-to-use handset. New PCS will take on a multitude of faces; in some iterations, it will take on the face of enhanced cellular and will be built off the big cell structure of cellular. In other iterations, it will look more like CT2 -- with the emphasis on many low-power microcells. . . . . New PCS will address a variety of segments -- in terms of auto mobility, it will act like cellular. It will also provide outstanding in-building service and enhanced portability for pedestrians. It has the advantage, as well, of serving as a wireless local loop."[9]

The Yankee Group

The Yankee Group has distinguished between PCN, which it describes as "the cordless microcellular market," and PCS, which it uses to refer to the "broad wireless mobile market."[10]

Mark Lowenstein of the Yankee Group has also said "There will be two types of PCS: 1) niche services, which will be provided through a small regional network or in a city; 2) larger, regional types of service, which will take a tremendous amount of capital. Players such as MCI will partner extensively. Those with the deep pockets are the likeliest to survive . . . . Therefore we believe few new faces will be offering PCS; many large, existing service providers will be in the PCS game, and not too many new entrants."[11]

It is clear from these studies that PCS is many different things to many different people -- it is interpreted as local loop bypass, as competition to cellular and landline services, as an adjunct to the wired network, and a myriad of as-yet undefined applications. Thus, definitions of success, and recommendations of what the proper predicates are for those results, vary from case to case.

How Large Will The Wireless Market Be?

Every analyst and participating company declares that the wireless market is growing by leaps and bounds. That is evident from every study from every source.

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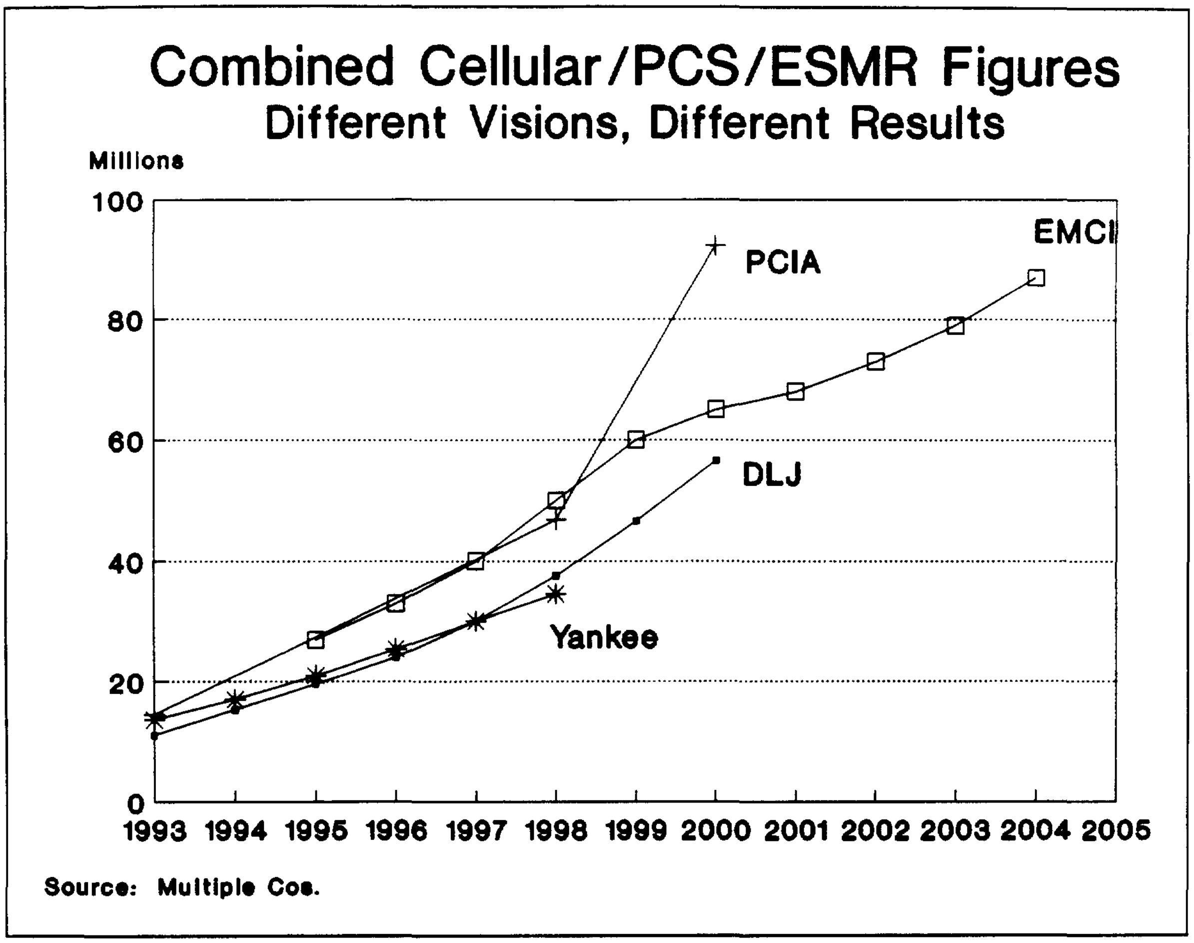
[9]"The PCS Challenge: Opportunities for Cellular Carriers in Tomorrow's Wireless Marketplace," *Wireless Communications Forum,* March 1994, at p.25.

[10]"Digital Cellular and Personal Communications Services," *Wireless Communications Forum,* July 1993, at p.62.

[11] "PCS News' Special Survey: Executives Preview PCS' Future,"*PCS News,* January 20, 1994, at p.7.

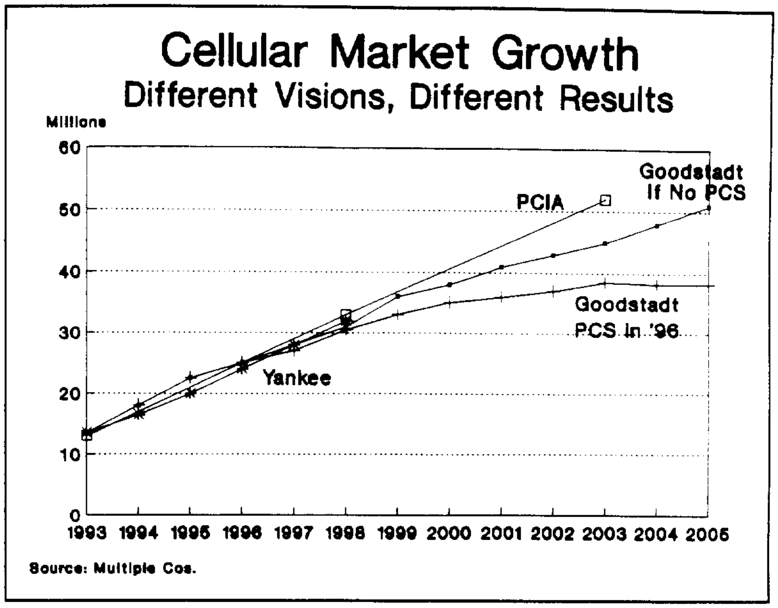
The reports which attempt to estimate overall market growth are dealt with in this section, and simple review indicates that they are "all over the map." This is true both for service-specific projections, as well as for projections of overall mobile service subscribership -- in fact, there is as much variation between the combined market projections as between the service-specific projections.

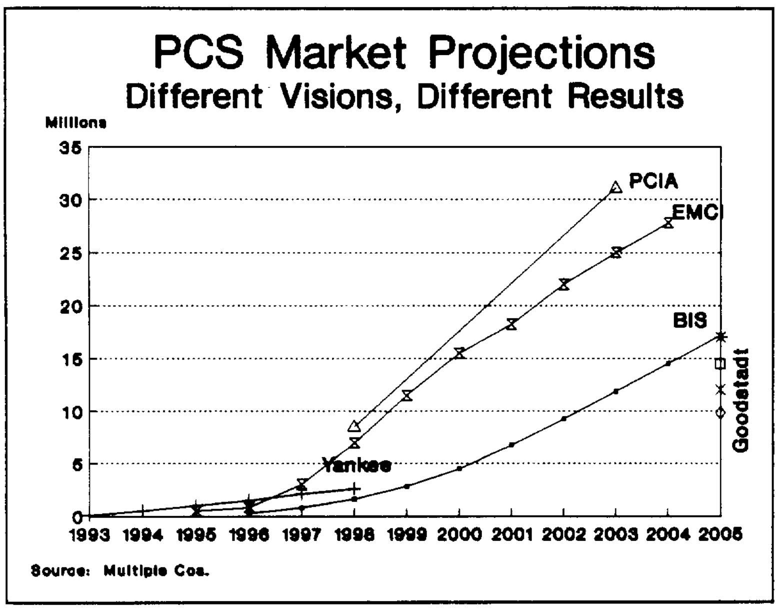


Logically, this result is inevitable. Because PCS is so broadly defined, and because existing mobile services are increasingly converging in their capabilities and costs, projecting service-specific growth is subject to wide variances depending upon the assumptions used in deriving the projections.

Likewise, while overall market growth may be projected, it too is subject to variance depending on the assumptions used. Thus, as the above chart indicates, Donaldson, Lufkin & Jenrette projects 56.5 million combined cellular/ESMR/PCS users in 2000, compared with Economic and Management Consultants International projections of about 60 million combined users. (The Yankee Group projections stop in 1998, and even in that year omit SMR/ESMR services.)

And comparison of studies which seek to provide service-specific projections indicates a broad spread between those projections. Thus, PCIA projects PCS subscribership in 1998 of 2.6 million, compared with the Yankee Group projection of 8.55 million. And in later years, a range between 12 million and 17 million are offered by Barry Goodstadt, depending on the date of roll-out.





But CTIA prefers to remain agnostic about such projections. The true test of PCS, and of all other wireless services, will come in the marketplace. Historians and industry observers may look back and marvel at how we under- (or over-) estimated the demand which the public really harbored for these individual mobile services, or that we failed to project the growth of some as-yet unimagined application.

Columbia PCS Inc./Columbia Capital

Steve Zecola, President and CEO of Columbia PCS, has stated that "Consumers throughout the U.S. are both consistent and insistent in their demand for communications mobility -- whether it be voice, information delivery or data retrieval. Consumer demand for communications mobility will grow from 15 million customers today to 60 million by the turn of the century with new features such as a single phone number per person for life becoming commonplace."[12]

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[12]"Columbia Capital Forms PCS Service Venture; Steven Zecola Named President and CEO," *PR Newswire,* February 15, 1994.

Donaldson, Lufkin & Jenrette Projections

Donaldson, Lufkin & Jenrette's Winter 1994 report on *The Wireless Communications Industry* includes its "Basic Penetration Model" for the U.S. cellular industry, projecting subscribership through the year 2000. However, the model now includes PCN and ESMR. The model projects growth from 11 million subscribers as of year-end 1992 to 56.6 million in the year 2000, rising from 5.98 percent penetration to 25.18 percent penetration.[13]

	1993	1994	1995	1996	1997	1998	1999	2000
Subs. (000)	11,033	15,300	19,600	24,100	30,100	37,600	46,600	56,600

Source: Donaldson, Lufkin & Jenrette, Winter 1994 The Wireless Communications Industry, Table 4.

Mercer Management Projections

A Mercer Management Consulting Inc. survey's findings indicate that PCS "and other wireless services could be used by up to 36 percent of the U.S. population over the next 10 years, and that wireless eventually will replace much of today's wireline telephone service as people 'cut the cord' at home and at work."[14]

According to *PCS News*, the Mercer study estimated that cellular and PCS would grow to be a $ 25 billion market during the next ten years. The interview portions of the survey indicated that the 30 experts expected build-out to occur quickly in the MTAs in order to recover investment costs, capture market share, and combat cellular preemption. The expectation was that in most MTAs service will be provided to at least 10 percent of the population within two years, and to 25 percent of the population within four years.[15]

Technology Futures Inc. Projections

Technology Futures, Inc., of Austin, TX, has projected 38 million PCS/cellular subscribers by 2001 in their report on *Personal Communications: Perspectives, Forecasts and Impacts.*[16]

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[13] Donaldson, Lufkin & Jenrette, *The Wireless Communications Industry*, Winter 1994, Table 4 at p.12.

[14] *Mercer Management News Release,* February 8, 1994.

[15] *Id.* at p.3.

[16] "Recent PCS Studies: From Auction Strategies to Market Projections," *PCS News,* January 6, 1994, at p.10.

Market Shares of Wireless Services

The real issue being debated seems to be ***<u>who is growing, and by how much</u>.*** ***Both those reports which attempt to develop service-specific estimates, and estimates which have been advanced in connection with special pleading for manipulation of the rules governing who can participate in PCS, are dealt with in the following section.***

Action Information Services

Action Information Services (AIS) has forecast 17 million PCS subscribers by 2005, and annual industry revenues of almost $ 8 billion. According to RCR, the AIS forecast projects a shift in urban service revenues between cellular, PCS, and paging from 81 percent, 1 percent and 18 percent in 1995 to 62 percent, 29 percent and nine percent in 2005.[17] According to one report, the study author indicated that "Unless PCS is rolled out soon, . . . the cellular industry, which signed up 4.9 million new subscribers in 1993 to give it more than 16 million for the year, will capture much of the middle-income mass market that PCS has targeted."[18]

AT&T

Joie Pacifico, AT&T PCS unit director of marketing, has projected that there will be 20 million PCS subscribers by the year 2000.[19]

BIS Strategic Decisions' Projections

A BIS Strategic Decisions' presentation, at the *Datacomm '93 Fall* trade show held in Washington, D.C., in December 1993, stated that the total market for mobile communications services was about $ 10.3 billion in 1992, with 20 percent of the market being paging, and one percent being data, the remainder being voice applications. (Given that cellular revenues amounted to $ 7.8 million in 1992, that would appear to allocate $2 billion to paging, and $ 100 million to mobile data.)[20]

BIS Vice President William Ablondi forecasted that the total market would grow to about $ 25 billion by 1993, with about 4 percent of the market being paging, about 20 percent being data, and the remainder voice applications. BIS projected that by

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[17]"Another PCS of the Pie," *RCR,* March 28, 1994, at p.1.

[18]"PCS Delay is 'a killer,' says new market study," *RCR.newsfax,* April 5, 1994.

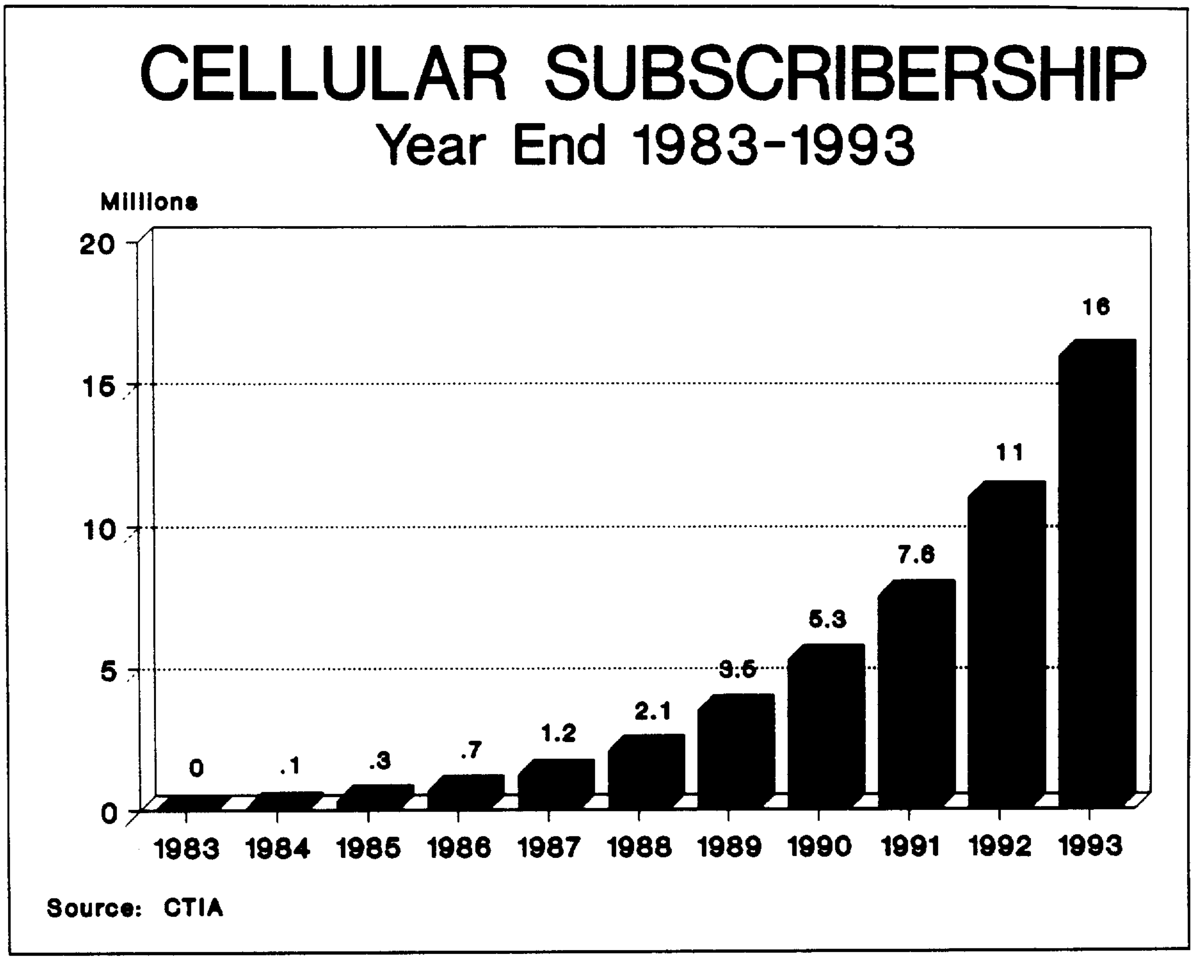
[19]"The Personal Touch," *The Economist,* October 23, 1993.

[20]Total cellular revenue figure derived from CTIA's *Semi-Annual Data Survey*, December 1992, released March 2, 1993. *See* CTIA News Release "Cellular Subscribers Grew 46 % in 1992 Total More Than 11 Million," March 2, 1993.

the year 2000, about 14 million Americans will be actual users of Personal Digital Assistants (PDAs), out of a potential base of 42 million prospective users.[21]

Cellular Telecommunications Industry Association

CTIA does not ordinarily project growth -- preferring to track current, measurable figures. CTIA's Semi-Annual Data Survey, which has traditionally polled cellular service providers, has over time shown that cellular has experienced annual subscriber growth rates between 36 and 44 percent.



Such rates have consistently exceeded expectations, and indicate a consumer acceptance of wireless services both broader and deeper than anticipated. Indeed, CTIA itself is agnostic over demand projections, reality so often varying from expectations, preferring to observe what does develop in the marketplace.

[21] *Cellular Sales & Marketing,* December 1993, at pp.2-3.

Donaldson, Lufkin & Jenrette Projections

The annual Donaldson, Lufkin & Jenrette report projects that the share of PCS/PCN in the year 2000 will be 20 percent of the total wireless market. DLJ also notes an American Mobile Telecommunications Association (AMTA)/EMCI projection that SMR/ESMR will grow from 1.5 million subscribers in 1993 to 4.4 million subscribers by 1998.[22]

DLJ has also reported EMCI and Motorola estimates for paging units. EMCI estimated there were 18.7 million paging units in service as of year end 1993, and projects that there will be between 26.7-33.3 million in service by year end 1997. Motorola, by contrast, estimates that there will be 30 million paging terminals in service by year end 1997.[23]

Northern Business Information

Northern Business Information (NBI) has projected that within five years of PCS introduction, out of 98 million telephone households in the U.S., 68 percent will own cordless telephones, that one quarter of those wireless homes will also own a cellular phone, and that altogether nearly 18 percent of telephone households will own a cellular phone.[24]

NBI estimates that 42 percent of such cordless homes will be potential PCS subscribers. Of the total universe of households, 15 percent will be potential PCS subscribers, 15 percent will be unreachable, and 70 percent will be "non-PCS" users.[25]

PCIA Projections

In announcing the results of PCIA's *1994 PCS Market Demand Forecast*, Tom Stroup, then head of PCIA, described PCS as complementing rather than replacing existing technologies, and stated that the 2 GHz PCS services (referred to as "New PCS") "will be heavily oriented to consumer service. Results show that business penetration for New PCS in [1998] is a modest 30%, suggesting that New PCS will not necessarily follow the traditional pattern of business to consumer migration."[26]

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[22] Donaldson, Lufkin & Jenrette, *The Wireless Communications Industry,* Winter 1994, at p.22.

[23] *Id.* at p.23.

[24] "Cooperation & Demand," *Wireless Communications Forum,* July 1993, at p.46.

[25] *Id.*

[26] "Telocator Changes Name to PCIA, Releases Forecast on PCS Markets," *TR Wireless News,* February 10, 1994, at pp.10-11.

The Forecast observed that 2 GHz PCS "is not expected to replace any existing wireless technology although increased competition will certainly affect the growth rate of the other services."[27] The Forecast projected that, as indicated in the table below, that total "New PCS" penetration is expected to grow to 3.1 percent of the total U.S. population market (8.5 million subscriptions) within five years, compared with projected cellular penetration of 12 percent.

The theme of complementary growth was repeated by Amy Stephan, PCIA's Director of PCS, who declared that "not only will PCS develop, but existing services will grow with it, 'the entire pie will grow,'" and by Wayne Schelle, Chairman of American Personal Communications, who declared that "no other services will drown; they all will grow."[28]

	1993		1998			2003		
Service	Subs (Ms)	Penetr'n (%)	Subs (Ms)	Penetr'n (%)	5 yr subs % Change	Subs (Ms)	Penetr'n (%)	5 yr subs % Change
New PCS			8.55	3.1%		31.11	10.4%	364.9 %
Satellite	0.1	.04%	1.32	0.5%	1224.0 %	4.11	1.4%	210.8 %
Paging	19	7.4%	36.8	13.3%	93.7%	65.3	21.7%	77.4%
Data	0.05	.02%	3.36	1.2%	6630.2 %	5.65	1.9%	67.8%
Cellular	13	5.0%	33.07	12.0%	154.4%	52.3	17.4%	58.1%
SMR & ESMR	1.5	.6%	5.19	1.9%	245.7%	8.95	3.0%	72.6%
Total	33.7		88.3		162.4%	167.4		89.6%

Source: 1994 PCS Market Demand Forecast, PCS Technologies Forecast Table
The following US population figures were used: 1992/255 million; 1993/258.5; 1998/275.8 million; 2003/300.3 million.
Note: Total subscriptions includes individuals with multiple subscriptions across services (i.e., there are more subscriptions than subscribers).

Goodstadt Projections

Barry Goodstadt, formerly senior consultant to Arthur D. Little, projected the relationship between cellular and PCS in two iterations -- first as a representative of

[27] *Id.* at p.11.

[28] *PCIA Bulletin,* February 4, 1994, at pp.6-7.

Arthur D. Little for the January 1994 PCIA conference, and then as a representative of EDS Management Consulting at a presentation to the FCC on March 24, 1994, sponsored by PCS Action.

The Arthur D. Little presentation projected that, absent PCS development, cellular would achieve subscriber penetration of 55.1 million by 2006. With PCS introduced in 1996, cellular would achieve penetration of 38.2 million, and PCS would achieve penetration of 25.4 million (totaling 63.6 million subscribers). Delaying PCS introduction to 2000 would result in cellular penetration of 45.3 million and PCS penetration of 9.8 million (totaling 55.1 million). Goodstadt observed that "you [presumably a PCS licensee] lose about 20 percent of the population every year you wait."[29]

The Goodstadt projections for Arthur D. Little can be compared with those submitted to the FCC on March 24, 1994. In that study, Goodstadt revised his projections, concluding that PCS demand levels are reduced by 15 percent for each year of delay.

Absent any deployment of PCS, cellular was projected to reach penetration of 51 million by 2005. If PCS was introduced in 1996, it was projected to achieve penetration of 17 million and cellular penetration of 38 million by 2005 (totaling 55 million). Assuming PCS introduction in 1997 or 1998, PCS penetration was projected to reach 14.5 or 12 million, while cellular's share appears from the accompanying graphic to be about 41 or 43 million (thus totaling 55 to 55.5 million). The difference is a PCS market share of 22 or 26 percent of the wireless market in 2005.[30]

The Goodstadt study stated that the results implied that "[r]eduction in demand for PCS due to delay may make for a less than attractive business proposition -- particularly since the cash flow in early years has a great influence on the attractiveness of the business case" and that "[s]lowing of licensing will strengthen the cellular position." ***In spite of the implication that cellular companies have something to gain from delay, CTIA has called for the FCC to move forward expeditiously with the licensing of the PCS industry -- because cellular carriers, too, have a desire to utilize the new spectrum to deliver new services.***

Another inference which may be drawn from the study is that the issue being debated between the lines is one of market share, and the desire of some potential entrants to ensure a higher market share through manipulation of the FCC's rules.

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[29] "Evaluating PCS Markets," *PCS News*, January 20, 1994, at p.4.

[30] See "Effect of Delay on PCS Market Potential: Briefing to FCC PCS Study Group," dated March 23, 1994, and filed as an attachment to Letter from Ron Plesser, Piper & Marbury, to William Caton, Acting Secretary, FCC, re GEN Docket No. 90-314, March 24, 1994.

Mercer Management Projections

The Mercer Management survey indicated that the PCS market can be mapped into seven differentiated segments -- two business, and five consumer -- with widely varying responses to new services. The findings indicated that there is a "large market for low-ubiquity service (e.g., service to local area, frequented area) at low prices. Not everyone needs or wants premium wireless service."[31]

Yankee Group Projections

The Yankee Group has produced studies based on "Technologically Advanced Family" tracking surveys, which examine likely, possible and unlikely adopter populations. Based on their surveys, the "Digital Cellular and Personal Communications Services" report made the following projections.[32]

Yankee Group PCS Projections**

	1991	1992	1993	1994	1995	1996	1997	1998
cellular	7.6	10.5	13.5	16.5	20.0	24.0	28.0	32.0
PCS	0.0	0.0	0.1	0.5	1.0	1.5	2.1	2.6
Paging	11.5	13.2	15.2	17.2	19.2	22.0	24.0	26.0
Mobile Data	0.25	0.50	1.2	2.1	3.0	4.3	5.7	7.4
Mobile Comp.*	0.0	0.0	0.023	0.075	0.255	0.795	1.515	2.595
PDAs	0.0	0.0	0.0	0.022	0.094	0.289	0.889	1.795

Source: The Yankee Group, 1993
* Portable computers with integrated wireless communications capability.
** Users stated in millions.

What is the upshot of these studies? The consensus is that the market is growing. The consensus is that, by and large, all services will experience growth. The precise amount of the growth, both for the entire market and for specific services, varies from study to study. In fact, the growth which we may expect is undeniably subject to variation, because we do not know precisely what it is that we are measuring. Are we measuring the right market, and the right characteristics? And, even if we are measuring the right markets, and are calculating the correct

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[31] *Mercer Management News Release,* February 8, 1994, at p.2.

[32] "Digital Cellular and Personal Communications Services," *Wireless Communications Forum,* July 1993, at p.67.

current cross-elasticity of these services, will those measures remain true into the near future?

As indicated in the preface to this section, CTIA prefers to maintain a healthy agnosticism about demand studies. They are indeed interesting, but they may tell us more about the student of the market, than the actual market which lies ahead of us.

Supply/Demand Substitution in Services

One measure of competition is the degree to which services are substitutable. One indicator of that substitutability are the plans and projections of the companies involved in bringing those services to the marketplace. The following statements of intent of myriad companies -- cable companies, traditional SMR providers, ESMR companies, pure PCS pioneers, cellular companies, and interexchange carriers -- make clear that these companies view PCS as an opportunity, as one provider put it, "to cross-sell" services and features.

In fact, as the three graphics produced by EMCI and OneComm (then CenCall), and appearing here, indicate, both analysts and service providers envision a unitary market, driven by technological and service convergence, and competing on the basis of features and price.

American Mobile Telecommunications Association (AMTA)

Alan Shark of AMTA projected SMR involvement in PCS, by noting that "too many people forget that SMRs offer paging, private radio applications, customer service and repair, and they have a strong customer base. The logic is there for SMRs to install and service PCS wireless PBXs."[33]

Columbia PCS Inc./Columbia Capital

Steve Zecola, President and CEO of Columbia PCS, has stated that "Columbia PCS Inc. will . . . offer[] customers one-stop shopping for local telephone service, long distance service and mobility service. We will provide a comprehensive replacement for existing local, long distance and cellular service."[34]

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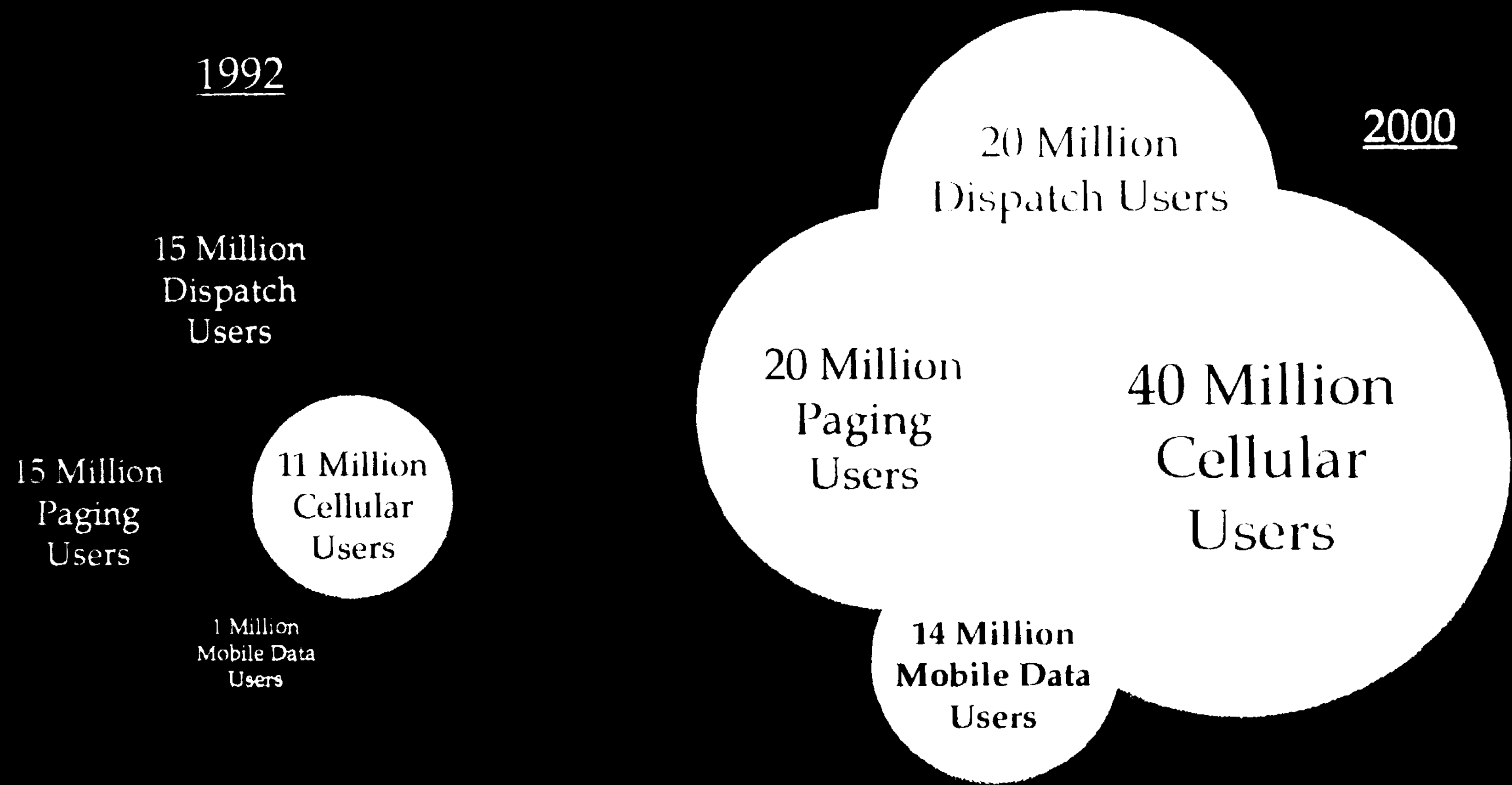
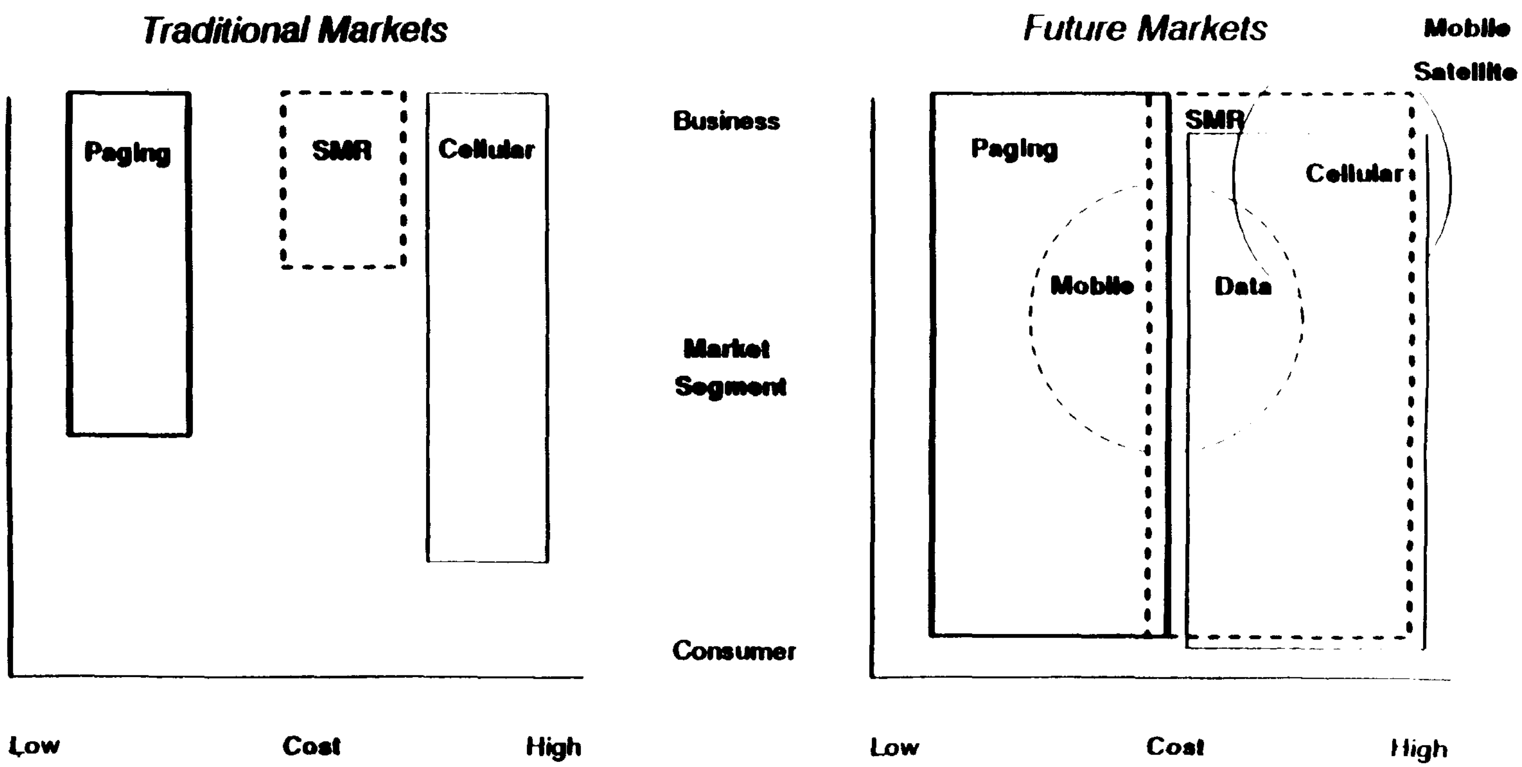
[33]"Specialized Mobile Radio and Personal Communications Networks: Making Waves," *Wireless Communications Forum,* December 1993, at p.51.

[34]"Columbia Capital Forms PCS Service Venture; Steven Zecola Named President and CEO," *PR Newswire,* February 15, 1994.

Integrated Services



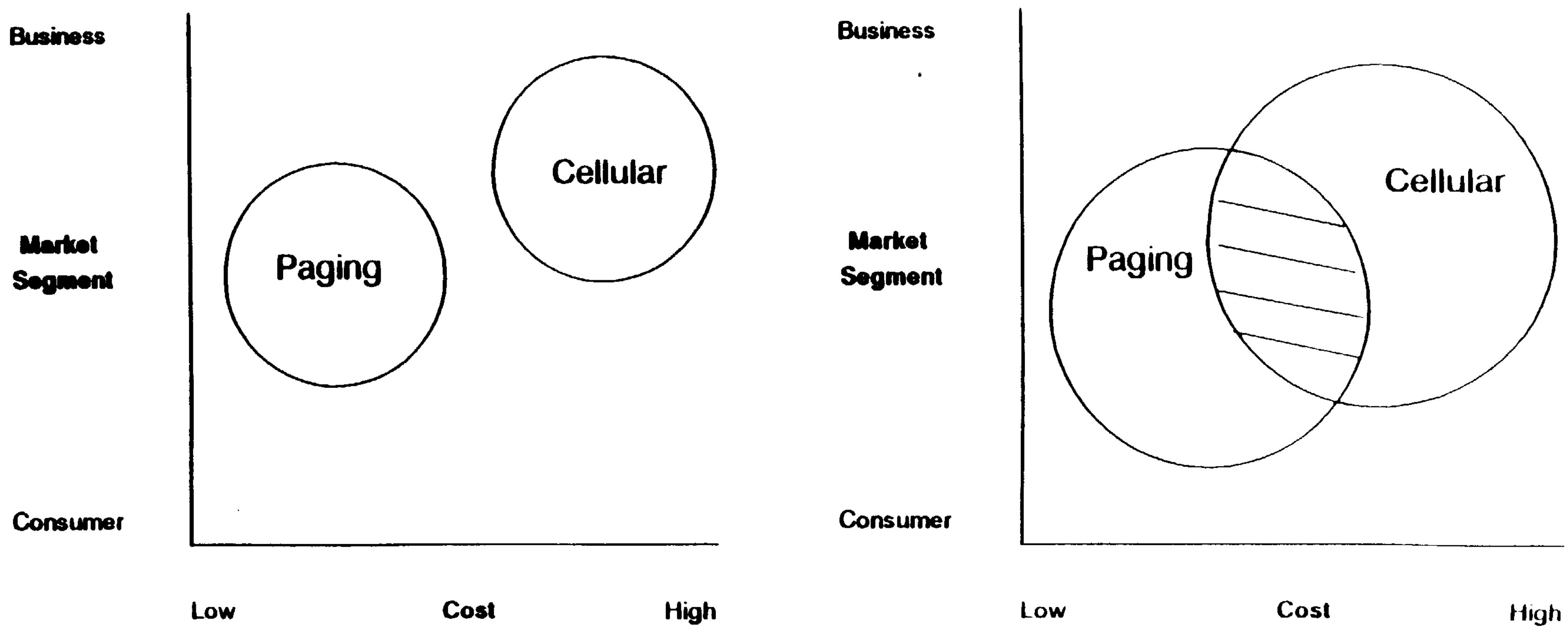
Mobile Communication Target Markets, by Technology



Note: Excludes PCS.

Source: EMCI, Inc.

Changes in Market Positioning of Paging and Cellular Due to Price Sensitive Consumers



Note: Excludes PCS.
Source: EMCI, Inc.

Dial Page Plans

Bill deKay, Dial Page Executive V.P. of Business Development, has said "We think there will be a tremendous opportunity to cross-sell paging, cellular and SMR services" -- targeting existing customers, multiple technology users, multiple location companies, frequent travelers and companies with two-way private systems.[35] Using Motorola's Integrated Radio System (MIRS), Dial Page's ESMR subsidiary Dial Call intends to combine the capability for mobile phone, dispatch, two-way alphanumeric messaging and mobile data applications in their subscribers' units.[36]

EMCI Projections

Economic and Management Consultants International (EMCI) contends in a recent report that the next generation of Specialized Mobile Radio "will combine spectrally efficient radio equipment with a wide array of mobile services including dispatch, telephone interconnect, messaging and advanced mobile capabilities."[37]

EMCI, noting the erosion of the boundaries between the technologies and services which have traditionally been viewed as separate,[38] projects that the "combination of voice and data services, wide-area coverage and potential for transparent roaming agreements will position digital SMR as a leading mobile communications provider in the late 1990s." Annual analog SMR growth is estimated at about 150,000 subscribers, and EMCI projects that by 1998 66 percent of SMR radios in service, and 90 percent of sales, will be digital.[39]

In fact, EMCI has also recently issued a report, "Positioning SMR in a PCS Marketplace," which repeats the conclusion that the SMR industry is well-positioned to compete in the expanding wireless marketplace.[40]

Freedonia Group Projections

The Freedonia Group projects that "Despite competition from PCS, markets for

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[35] *Land Mobile Radio News,* March 11, 1994.

[36] *Id.*

[37] "The State of SMR & Digital Mobile Radio: 1993-1994," noted in "Quick Studies" in *Wireless Communications Forum,* March 1994, at p.83.

[38] Consistent with the EMCI report on "The Changing Wireless Marketplace," December 1992, which is the source of the EMCI graphics appearing herein.

[39] *Id.*

[40] *Land Mobile Radio News,* April 1, 1994.