

DO NOT FILE BY ORIGINAL

~~94-314~~  
90-314

RECEIVED

APR 11 1994

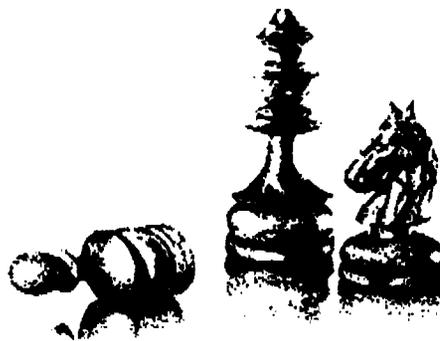
FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

# Demand for Personal Communications Services

Presentation to the Federal Communications  
Commission Task Force

Washington, D.C.  
April 11, 1994

Mark Lowenstein  
Director, Wireless/Mobile Communications  
Research and Consulting



the  
Yankee Group

200 Portland Street  
Boston, MA 02114  
Telephone: (617)367-1000  
Fax: (617)367-5760

No. of Copies rec'd \_\_\_\_\_  
List ABCDE \_\_\_\_\_

J

# Demand for New Personal Communications Services

## Yankee Group Definition of PCS

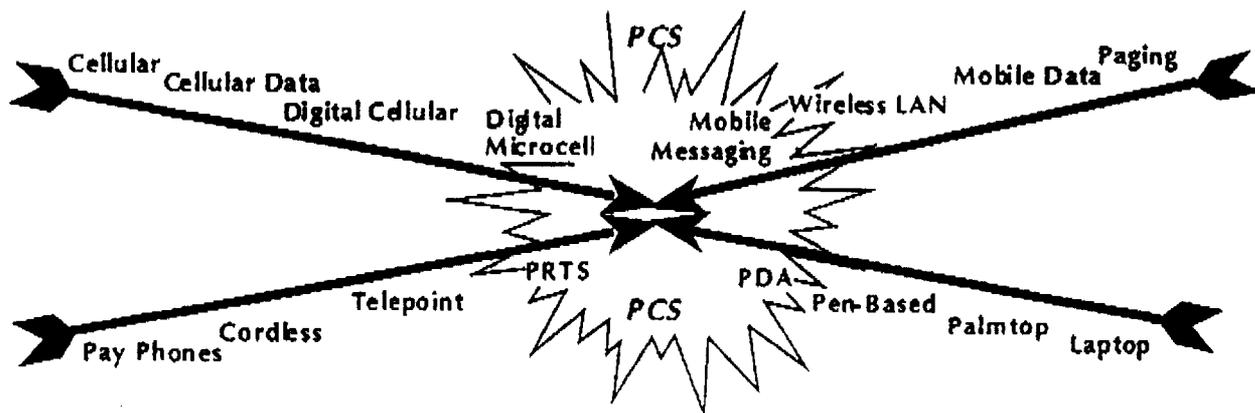
The Yankee Group sees Personal Communications Services as a broad market label for personal communications capabilities for residential and business customers that usually eliminate the need for physical wired connection to the house, car, or office. PCS is a term encompassing a wide range or family of mostly wireless-mobile technologies, chiefly:

- Cellular
- Paging
- Enhanced cordless telephony
- Microcellular personal communications networks
- Enhanced specialized mobile radio
- Mobile data (not wireless LAN)
- In-office wireless, such as wireless PBX and Centrex
- Satellite-based systems

In essence, the Yankee Group sees PCS as a network infrastructure designed to support the above applications. Some PCS services will be offered by new entrants over the newly licensed PCS spectrum, while other PCS services will be offered over existing wireless network infrastructures, such as cellular, paging, private data networks (such as RAM and ARDIS), and enhanced SMR. We believe it is important to not limit the definition of PCS to the newly licensed spectrum, but, rather, to recognize that this extra bandwidth will allow a broader range of competitive wireless services to be offered by both incumbent service providers and new market entrants.

### Exhibit 1: Broad View of PCS

Source: the Yankee Group 1994



the Yankee Group  
200 Portland Street, Boston, MA 02114

Telephone: (617) 367-1000  
Fax: (617) 367-5760

Copyright 1994, the Yankee Group. All rights reserved

## How Will PCS Be Different?

The mobile industry today counts over 15 million cellular subscribers, 17 million pager users, 13 million private radio users, and 7 million users of portable computers. All are experiencing robust growth. In order for PCS to be successful, the Yankee Group believes PCS will have to offer the following substitutive or complementary capabilities (what we refer to as value-added):

- Better localized ("microcellular") coverage, such as in airports, shopping malls, tunnels, and inside buildings.
- Based principally on portable handsets for more walk around, "neighborhood" capability
- Greater levels of network intelligence, enabling true "follow-me" type services
- Both voice and data capabilities
- Rates between today's prevailing landline and cellular prices
- Flexible pricing plans, where users pay more for incremental levels of mobility

## Demand for PCS

The Yankee Group has developed a demand model for PCS, based on the following primary research:

- A 1993 Mobile Professional Survey of individual and business use of and interest in various wireless products and services
- Our annual Technologically Advanced Family surveys of consumer purchase behaviors
- Extensive and ongoing discussions with industry players in the terminal, infrastructure, and service provision areas

## Key Findings from the Surveys

Among cellular users, we found:

- Increasing mix of business and personal use. Fewer than 10 percent of users say they never use their cellular phone for a business call
- Among non-business users, "security" is the most important reason cited for using a cellular phone.
- Among individuals we identified as having high levels of mobility, 61 percent use cellular at least occasionally to communicate with customers—an important differentiator
- An increasing percentage of cellular bills are being paid by individuals rather than employers

## Plans to Purchase a Cellular Phone (over the next year)

	Considering Purchase	Definitely Planning
Total Non-users	13%	2%
"Mobile" Individuals	29%	7%
Portable PC Users	23%	3%
Paging Users	25%	6%

### Factors Driving PCS

Data from the survey supports a range of PCS services that, as defined above, are substitutive/complementary to existing cellular services. Among the key findings:

- Difficulty in obtaining coverage is the most frequently experienced problem among cellular users: 46% experience it at least "occasionally", 11% "often"
- 31% of non-cellular users surveyed cite service cost as the most important reason for not using a cellular phone. Only 31 percent say they "have no need" for a cellular phone
- Respondents are willing to pay 50 percent more for a cordless phone with a range of one mile from their house

We asked users about their interest in a variety of PCS-type services. We presented terminal and service price scenarios based on PCS market trials. Data is presented in the enclosed Exhibit 2.

A key finding from the data is that *individuals are interested in mobility over a wide area...they expect and are willing to pay a price premium for incremental levels of mobility.* The most advanced service proposed—and the most expensive one—generated the keenest level of interest. Data that we have seen from the PCS trials supports this conclusion as well.

### Exhibit 2: Demand for PCS Services

Source: the Yankee Group, 1994

Service Description	Likely Pricing	Total Base*	Rep. Sample	Cellular Users
CT-2, outgoing only, with home cordless capability	Terminal: \$100 Usage: pay-phone and landline	28%	26%	28%
CT-2 Plus, with incoming. Range is 3-5 miles from home	Terminal: \$150 Usage: landline with 25% premium for mobility	25%	23%	26%
"Follow-me", where calls could be made or received from virtually any location	Terminal: \$200-300 Usage: Landline rates while at home, 25% more in neighborhood, 50% more when in a car	39%	33%	47%

\* Percent either "very or somewhat interested"

## Market Forecast

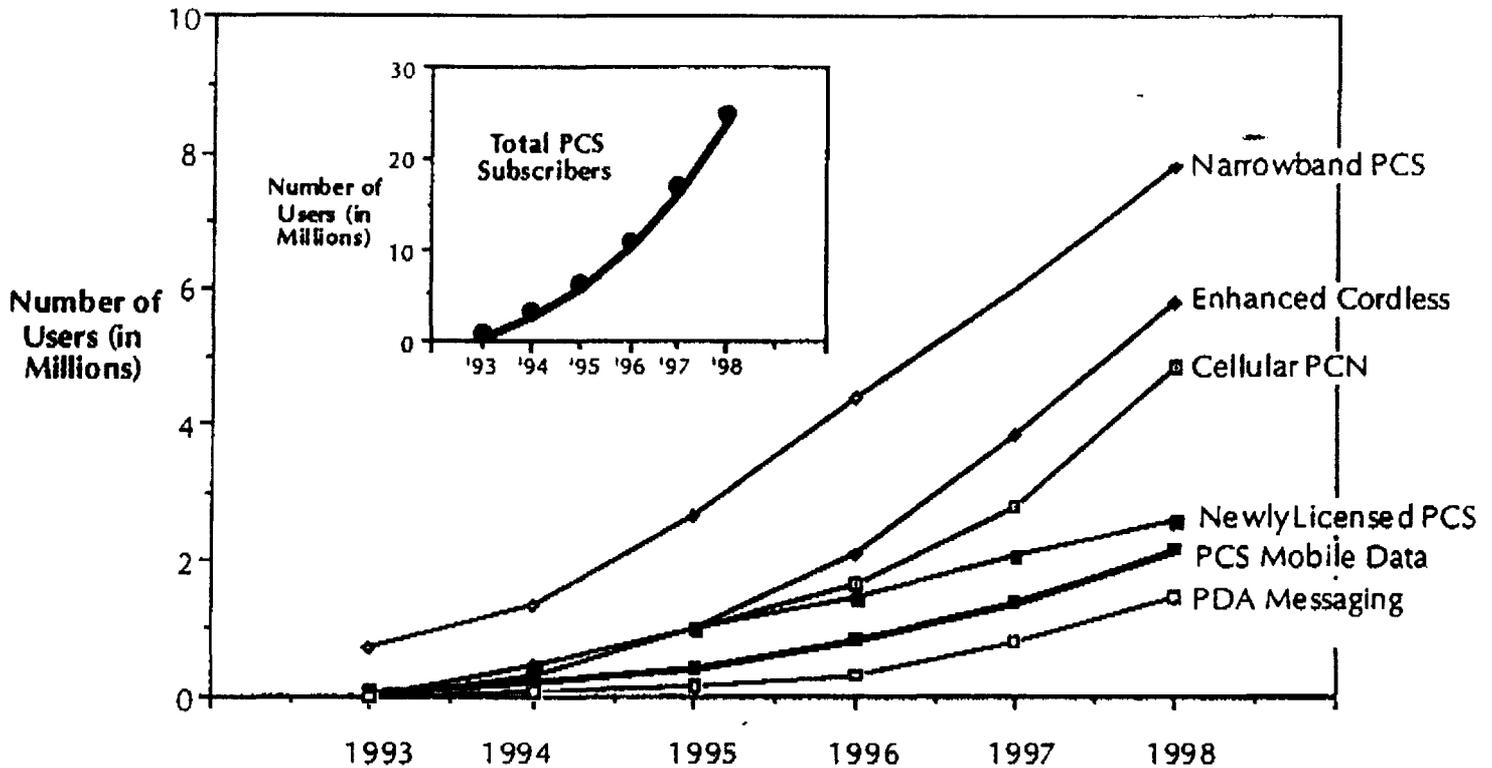
Based on the survey data as well as our ongoing industry research, the Yankee Group has developed a forecast for PCS. We believe there will be 25 million PCS subscribers by 1998. However, only some of these subscribers will come from the newly licensed services. Some PCS subscribers will be using narrowband paging, while others will be using PCS-like services over the cellular spectrum. Other services that we define as PCS, such as PDA messaging, could operate over a variety of network infrastructures, such as newly licensed PCS spectrum, ESMR, cellular (using CDPD packet data), or RAM/Ardis private data networks.

Our forecast is broken into the following market segments:

- *Cellular PCN.* We expect 15 percent of the forecast cellular subscriber base of 32 million in 1998 will be using microcellular, "follow-me" type PCS services over the cellular spectrum.
- *Newly licensed PCS services.* Between 1996 and 1998, PCS services from new service providers over newly allocated spectrum will be rolled out. We expect the population of this segment of PCN to grow to 2.6 million by 1998.
- *Enhanced cordless.* The Yankee Group expects that beginning in 1994, the cordless phone market will experience major product developments, mainly in the areas of improved voice quality and extended range. We expect cordless phones to have neighborhood coverage capabilities in the 1995-1996 period.
- *Narrowband PCS.* This segment includes mainly enhanced paging services over the 900 MHz spectrum recently allocated by the FCC. Because of the already significant installed base of nearly 15 million paging subscribers, the Yankee Group believes narrowband PCS will be the largest component of PCS in the early years in our forecast. By 1998, even though narrowband PCS is an important part of the overall PCS market, its overall position in terms of number of subscribers is diminished.
- *PCS mobile data.* The Yankee Group believes there will be a broader market for mobile data in the PCS world. There will be PCS devices, from portable phones to palmtop computers, that are personal in nature but will be capable of handling more than voice. We believe there will be slightly over two million PCS mobile data users by 1998—representing a segment of the overall remote data and PDA markets.
- *PDA messaging.* The PCS component of PDAs includes those PDAs that are equipped with wireless messaging capability. This base grows from near zero today to about 35 percent of overall PDA users—1.7 million—by 1998.
- *In-office.* The in-office market is not included in our forecast in Exhibit 5-4 because it is not subscriber-based.

### Exhibit 3: PCS Market Forecast

Source: the Yankee Group, 1993



### Methodology

The following outlines the methodology behind the Mobile Professional Survey:

- Survey was sent in August 1993 and data was tabulated in October 1993
- Data based on 1,490 respondents in the U.S., 166 in Canada
- Half of the surveys were sent to a pre-selected group of owners of one of the following mobile devices: cellular phones, pagers, and portable computers. The other half were sent to a random sample of the population (rep. sample). This methodology was used to assure enough data from existing wireless users and to compare them to a random sample of the population.
- Survey covers both business and personal use of wireless/mobile technologies: cellular and cordless, PCS, paging, mobile data, and mobile computing. Also assesses lifestyles and workstyles of respondents.

The PCS market forecast was based on preliminary data from the Mobile Professional Survey, data from our 1993 Technologically Advanced Survey, and our ongoing contacts with key players in the industry. The forecast model was also derived from the Yankee Group's existing industry forecasts for cellular, paging, mobile data

Confidence interval is generally plus or minus five percent for the Mobile Professional and TAF surveys.

94-14

**Demand for Personal Communications Services (PCS) in Rural Areas of the United States**

Prepared Remarks of

Daniel L. Trampush, Partner  
Telecommunications Consulting  
Ernst & Young  
1225 Connecticut Avenue, N.W.  
Washington, D.C. 20036

To

The PCS Task Force  
Federal Communications Commission

April 11, 1994

Thank you for inviting me to comment on PCS demand in rural areas of the United States. My comments are being made on behalf of the Rural Telephone Coalition which consists of the National Rural Telecom Association, the National Telephone Cooperative Association (NTCA) and the Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO). My purpose will be to discuss the differences between the nationwide studies of PCS demand and the work we have done on PCS demand in rural areas. I think there are some important observations about rural PCS demand that have implications for the Commission's PCS policies.

1. In the context of PCS (and communications generally) the critical characteristic of "rural" areas is that there are relatively few people per unit of geography. That is, for the purpose of studying demand for communications services, rural means low population density. "Rural" is not a demographic definition, although some people think of "rural" (incorrectly) in demographic terms (income level, educational attainment, type of employment, etc.).
2. People in rural areas tend to use communications services at least as intensively as people in urban areas. Communications services are at least a partial solution to the relative isolation of rural areas. We see this consistently in studies for long distance calling in urban and rural areas. Also, we see robust demand for enhanced services and features in rural areas.
3. Given similar types of PCS services and PCS prices, the probability of subscription to PCS should be no lower in rural than in urban areas. That is, we have discerned no difference in the intensity of demand for PCS among potential customers in urban and rural areas. The demand problem in rural areas is a problem of density—fewer potential customers per square

mile—rather than the probability of subscription or amount of usage per customer, which are similar to urban areas.

4. These observations lead to several implications for PCS demand in rural areas.
  - a. Extended-range cordless phones will be in high demand in rural areas. (A 200-foot range may be fine in an urban apartment, but not on a several hundred acre farm or ranch.)
  - b. The greater distances of travel in rural areas will require that PCS provide higher-speed mobility than in dense urban areas, where there is more foot traffic and congestion.
  - c. There are, of course, fewer potential customers per square mile than in urban areas, and these customers are not evenly distributed. Undoubtedly, there are concentrated pockets of PCS demand in rural areas, defined by geography and terrain. Isolated pockets of PCS demand may be the dominant pattern in mountainous or forested areas.
5. These demand-side implications lead me to make a few observations about how best to serve this rural PCS demand.
  - a. Relatively low customer density suggests that there may be greater economies of scope with existing communications networks in rural areas. By encouraging rural telephone companies to build-out the PCS networks in their wireline service areas, rural customers may obtain benefits of PCS that would otherwise take years to bring to rural America. Further, by maximizing the interworkability of rural PCS, cellular and telephone networks, for example, network costs may be reduced and the range of wireless services enhanced. In this context, restrictions on ownership of cellular and PCS would be bad for customers in rural areas.
  - b. Limitations on transmitter power and requirements for population coverage are important drivers of cost in rural areas, because of the relatively low subscriber density. Relaxation of such requirements, or adoption of policies which off-set these requirements, may bring more affordable PCS to rural areas faster.
  - c. Bringing PCS to the pockets of demand economically may require some creative use of technology, such as dual-mode cellular/PCS phones. Also, in order to increase rural

subscribership to PCS (thereby reducing average unit costs), the Commission may want to explore flexible ways to integrate PCS with wireline telephone systems.

In summary, there is significant demand per rural citizen for the enhanced services promised by PCS. There is just less demand per unit of geography. The demand and supply characteristics of rural PCS suggest the need for regulatory policies tailored to rural areas.

Thank you again for the opportunity to address you today. I hope that the work of this committee will bring enhanced and affordable personal communications services to all areas of the United States as quickly as possible.