

fee, and convert the filings into an electronic database that could be accessed by the Commission and by the general public. This would considerably ease processing, facilitate accessibility of data, and significantly reduce costs. In furtherance of this proposal, Telocator has designated a task force to develop electronic filing procedures.²⁶ In effect, all the FCC would be required to do upon reconsideration would be to provide an appropriate fee structure for the filings.

Another area where the Commission's rules unintentionally result in significant burdens upon PCS operators without a concomitant benefit lies in new Section 99.53(e) which requires the location of PCS antenna sites to be determined with an accuracy of no less than ± 5 meters in both the vertical (ground elevation) and horizontal (latitude and longitude) planes. Independent of whether individual site filings are required, it is unclear why such detailed information is needed considering the expense of complying with the ± 5 meter horizontal precision requirement.²⁷ To the degree that any individual site filings are required, Telocator therefore suggests allowing horizontal coordinates to be specified, as they

²⁶ This task force will call upon the resources of Telocator's membership and work with the Commission staff to develop detailed filing procedures to be submitted within the next 45 days. The task force will also consult with TR14.11 so that the electronic filing format is appropriate for use in coordinating planned PCS sites with fixed microwave operations and resolving interference problems between constructed stations.

²⁷ Achieving ± 5 meter horizontal precision is likely to require a costly manual survey. Even if 4 SV coverage is available, which is not always the case in urban environments, differential GPS using RTCM-104-SC pseudorange correction messages is not guaranteed to meet this accuracy requirement. Accordingly, costly interferometric GPS survey methods will be needed to guarantee ± 5 meter precision and will not necessarily be correlated to a map. Indeed, GPS position is given with respect to an absolute reference ellipsoid such as WGS-84, NAD-83, or NAD-27. In contrast, maps are absolute referenced to a reference ellipsoid but typically exhibit much better relative accuracy over short distances. The accuracy with which a GPS based position can be related to a typical USGS map is rarely as good as ± 5 meters.

are now for most services, with a precision of ± 1 second on a 7.5 minute quadrangle map of the same accuracy.²³

V. THE COMMISSION SHOULD MODIFY ITS RULES FOR PCS SERVICE AREAS TO DESCRIBE GENERICALLY THE COUNTIES CONTAINED IN EACH SERVICE AREA.

The Commission's rules defining PCS service areas by reference to major trading areas ("MTAs") and basic trading areas ("BTAs") refer specifically to works that are commercially published by Rand-McNally & Co. Telocator suggests that Section 99.13 of the Commission's Rules be modified to specify (a) the counties contained in each BTA and (b) the BTAs contained in each MTA. This generic approach will place information more efficiently and cost-effectively in the hands of the public and will provide several benefits in administering PCS.

First, the service area descriptions would be set out in full in the Code of Federal Regulations or in separate Commission releases, making those descriptions fully accessible at little or no cost to the public and to parties planning for PCS nationwide.²⁴ This approach would increase public access to government information, a goal of the current

²³ Telocator also suggests that the Commission may wish to consider requiring additional transmit site and local environment detail (e.g., street location, nearby structures, building floorplans) to be appended when needed to properly coordinate the site with other systems and fixed microwave users.

²⁴ Although Rand-McNally publications are widely available, some markets have been sold out of MTA and BTA maps for months (and these maps are only published by Rand-McNally in rather large atlases costing several hundred dollars). In some markets, four- to six-week backorders for MTA and BTA atlases have become commonplace. We also understand that copies of MTA and BTA data on computer diskette are sold by Rand-McNally for \$1,000. See Killen Associates, Inc., Petition for Reconsideration (filed Nov. 30, 1993). Adoption of Telocator's proposal would result in the removal of this unforeseen roadblock to the development PCS that has a particularly acute impact upon small, entrepreneurial PCS enterprises.

Administration, and would lower costs that otherwise could particularly disadvantage small businesses.³⁰ This process would parallel that used for cellular, which has been a success.

Second, these more precise definitions could track specifically the Commission's decision to create a separate MTA for the state of Alaska and several MTAs and BTAs for several insular areas. The approach we propose thus would more accurately reflect the Commission's decisions in both its PCS Reports.³¹

Third, this approach would protect against the possibility that the 1992 version of the Rand-McNally publication on which the Commission relies could go out of print or that Rand-McNally's MTAs or BTAs could be modified to be inconsistent with the areas on which the Commission based its PCS decisions. It also would prevent parties seeking alterations in licensing areas from embroiling Rand-McNally, a private party, in requests to alter BTAs or MTAs.

Fourth, this approach would make it easier for the Commission to adopt similar service areas for other Commission-licensed services by standardizing the information on which those service areas would be based. The Commission has proposed to utilize BTAs for the local multipoint distribution service, for example; having the counties that comprise BTAs set out specifically in the Commission's rules or in a Commission release would make it easier for the Commission to use MTAs and BTAs in the future.

³⁰ The cost of obtaining MTA and BTA data from Rand-McNally could have a ripple effect through the industry, causing costs for system planning, application preparation and other services to be increased. *See id.* (reporting that Rand-McNally generally charges \$12,000 plus 5 percent of net sales to attorneys, engineers and consultants wishing to utilize MTA and BTA data in serving clients).

³¹ The Commission separated Alaska from the Seattle MTA, and created "MTA-like areas" for Guam and the Northern Mariana Islands; Puerto Rico and the U.S. Virgin Islands; and American Samoa. The Commission also defined American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands as "BTA-like areas."

Finally, this approach would cure any copyright or trademark concerns that some parties may have. In particular, one pending petition for reconsideration points out that some small businesses may fear being held liable for copyright infringement by Rand-McNally if they use "MTAs" or "BTAs" without paying licensing fees directly to Rand-McNally.³² Although it is highly questionable that Rand-McNally would have any intellectual property rights either in the names "MTA" or "BTA" or in the facts of which counties are contained in each "BTA,"³³ describing PCS service areas by the generic counties contained in them would alleviate any doubt.

In summary, then, the public and the industry would benefit by a more specific and generic description of PCS service areas. A proposed Amended Section 93.13, including a description of the counties within each BTA and the BTAs within each MTA, is attached to this Petition.

VI. ONLY HAND-HELD SUBSCRIBER UNITS SHOULD AUTOMATICALLY BE REQUIRED TO COMPLY WITH THE RF EXPOSURE STANDARD FOR THE UNCONTROLLED ENVIRONMENT.

Telocator is also requesting clarification of the application of the uncontrolled/controlled environment distinction for new PCS systems. In particular, the

³² See Killen & Associates, Inc., Petition for Reconsideration (filed Nov. 30, 1993).

³³ One cannot claim copyright protection for facts or ideas, but only to particular expressions of facts or ideas. In the case of MTAs and BTAs, Rand-McNally legitimately may claim a copyright in the specific maps it has produced but cannot claim a copyright in the fact or idea that certain counties are grouped in certain BTAs and MTAs. See *BellSouth Advertising & Publishing Corp. v. Donnelley Information Publishing, Inc.*, 999 F.2d 1436, 1441 (11th Cir. 1993); *Kern River Gas Transmission Co. v. Coastal Corp.*, 899 F.2d 1458, 1464 (5th Cir. 1990) (finding certain maps not copyrightable); *Manthaw Bender & Co. v. Kluwer Law Book Publishers*, 672 F. Supp. 107 (S.D.N.Y. 1987). It is not at all unusual for private companies to define areas that are incorporated in the Commission's Rules; as one example, Arbitron produces definitions of "areas of dominant influence" that are referenced in the Commission's Rules. See, e.g., 47 C.F.R. § 73.3555(d)(3) (1992).

Commission *Second PCS R&O* concludes that "[f]or the purpose of type acceptance of PCS equipment we will require that all *hand-held PCS devices* comply with the IEEE/ANSI criteria for 'uncontrolled' environments," based on the proximity of the transmitting element to the user's head.²⁴ However, the text of Section 99.52 states that *all* PCS equipment is deemed to operate in an "uncontrolled" environment, which would include PCS base stations and non-handheld mobile units. Because the Commission's rationale for requiring compliance with "uncontrolled" environment exposure standards applies only to handheld transceivers, Telocator believes that the rule language should be rephrased to harmonize with the conclusion in the text and to permit PCS manufacturers and system operators to utilize the controlled environment exposure standards where otherwise applicable such as isolated base station locations that are only visited by trained employees cognizant of the issues surrounding RF exposure.

VII. THE LISTEN-BEFORE-TALK TIME FOR UNLICENSED PCS DEVICES SHOULD BE INCREASED.²⁵

As a final matter, Telocator suggests modifying the 10 millisecond ("ms") period specified in the listen-before-talk ("LBT") rule, and corresponding frame time, to 20 ms to permit the widest range of present and future technologies to operate in the unlicensed PCS band in the most equitable manner. As an initial matter, the 20 ms time frame modification is a multiple of 10 milliseconds which will avoid time/spectrum collisions and permit a more

²⁴ Order at ¶ 192 (emphasis added).

²⁵ Notwithstanding significant debate, Telocator's membership was unable to reach consensus on a number of issues surrounding the deployment of unlicensed PCS devices and therefore limits its discussion to this one issue. Telocator will review the other petitions for reconsideration that it anticipates will be filed in this proceeding and reserves the right to further address issues raised relative to unlicensed PCS in comments to those petitions.

flexible set of solutions within the unlicensed band. Furthermore, a 20 ms LBT period allows a greater range of technologies to use the unlicensed band, including several high compression vocoders that specifically require a 20 ms frame time. In addition, the additional 10 ms delay is not a significant impact on communications channel setup time. The idle portable may be searching in anticipation of an appropriate place in which to transmit, in which case there is no additional delay imposed. Accordingly, Telocator believes that the public interest benefits of a longer LBT period and frame time outweigh the minor consequences of an additional 10 ms delay.³⁶

VIII. CONCLUSION

For the foregoing reasons, Telocator respectfully requests Commission reconsideration and clarification of regulations adopted in the Second Report and Order in the PCS proceeding. Specifically, the Commission should:

- Increase maximum PCS power levels from 62 Watts ERP to 1,000 Watts ERP for base stations and from 1.2 Watts ERP to 12 Watts ERP for some mobiles;
- Extend the out-of-band emissions criteria to govern interference between adjacent PCS licensees and clarify that the resolution bandwidth for measuring out-of-band emissions is 1.0 percent of the emissions bandwidth;
- Modify the PCS-microwave interference criteria to allow TIA's TR14.11 committee greater flexibility to implement industry consensus solutions to engineering problems arising from coordinating PCS systems with fixed microwave users;
- Clarify the application filing procedures regarding site-specific information and work with Telocator's Task Force to develop workable, practical, and cost-effective electronic site filing requirements;

³⁶ This proposed modification would require revision to Sections 15.321(c)(1), (c)(5), and (c)(6) as well as 15.321(e).

- Restate the licensing areas in terms of counties rather than relying upon a proprietary map system.
- Clarify that the mandatory use of "controlled environment" RF exposure limits apply only to PCS handsets, and not, for example, to PCS base stations; and,
- Increase the listening period and frame time for "listen-before-talk" protocols specified in the rules for unlicensed devices from 10 ms to 20 ms.

Adoption of these limited modifications upon reconsideration will greatly facilitate the expeditious deployment of economic and high-quality wireless PCS systems and devices.

Respectfully Submitted,

Telocator, The Personal
Communications Industry
Association



Thomas A. Stroup
Mark Golden
TELOCATOR
1019 19th Street
Suite 1100
Washington, D.C. 20036
(202) 467-4770

December 8, 1993

Attachments

"Standard" DCS-1900 Link Budget

Exhibit A

Uplink		Downlink	
Mobile TPO	33 dBm	Base Station TPO	42 dBm
Cable Losses	-2 dB	Cable Losses	-2 dB
Mobile Antenna Gain	0 dBd	Base Station Antenna Gain	15 dBd
Effective Radiated Power	31 dBm	Effective Isotropically Radiated Power	55 dBm
1.2 watts ERP		316 watts ERP	
Path Losses	-152 dB	Path Losses	-152 dB
System Margin	-1 dB	System Margin	-1 dB
Base Station Antenna Gain	15 dBd	Mobile Antenna Gain	0 dBd
Diversity Gain	5 dB	Cable Losses	-2 dB
Cable Losses	-2 dB	Mobile Rx	-100 dBm
Base Station Rx	-104 dBm		
Base Station Antenna Height	120 feet	Base Station Antenna Height	120 feet
Mobile Antenna Height	5 feet	Mobile Antenna Height	5 feet
Coverage Radius (COST231 Urban)	1.75 miles	Coverage Radius (COST231 Urban)	1.75 miles
Coverage Radius (COST231 Suburban)	4 miles	Coverage Radius (COST231 Suburban)	4 miles
Coverage Radius (COST231 Rural)	13 miles	Coverage Radius (COST231 Rural)	13 miles

NOTE: "Optimistic" coverage radii without penetration/obstruction losses.

DCS-1900 Link Budget with Smart Antenna

Exhibit B

Uplink			Downlink		
Mobile TPO	33	dBm	Base Station TPO	42	dBm
Cable Losses	-2	dB	Cable Losses	-2	dB
Mobile Antenna Gain	0	dBd	Base Station Antenna Gain	20	dBd
Effective Radiated Power	31	dBm	Effective Radiated Power	60	dBm
	1.2 watts ERP			1000 watts ERP	
Path Losses	-157	dB	Path Losses	-157	dB
System Margin	-1	dB	System Margin	-1	dB
Base Station Antenna Gain	20	dBd	Mobile Antenna Gain	0	dBd
Diversity Gain	5	dB	Cable Losses	-2	dB
Cable Losses	-2	dB	Mobile Rx	-100	dBm
Base Station Rx	-104	dBm			
Base Station Antenna Height	120	feet	Base Station Antenna Height	120	feet
Mobile Antenna Height	5	feet	Mobile Antenna Height	5	feet
Coverage Radius (COST231 Rural)	18	miles	Coverage Radius (COST231 Rural)	18	miles

NOTE: "Optimistic" coverage radii without penetration/obstruction losses.



Personal
Communications
Industry
Association

EXHIBIT B

1994 PCS Market Demand Forecast

**Personal Communications
Industry Association**

January 1994

Introduction

The introduction of cellular service in late 1983 was a cannon shot in the second revolution in communications - mobility. By 1992, over 15 million Americans used pagers and over 11 million used cellular telephones. In the fall of 1993, another shot could be heard as the FCC announced the structure of the new Personal Communications Services (PCS) industry.

New PCS will combine with existing services such as cellular and paging to fundamentally change the way millions of Americans communicate. By 2003, we predict over 52 million subscriptions for cellular telephones, 65 million subscriptions for paging and messaging services, and 31 million subscriptions for New PCS. Additional tools such as mobile satellite terminals, special mobile data services, and advanced dispatch services will also help our diverse economy communicate without the constraints of wires. In sum, this study forecasts 167 million subscriptions to PCS services by 2003.

The Personal Communications Industry Association (formerly Telocator), conducted this study to evaluate the growth, composition, and characteristics of the future personal communications industry through a survey of mobile communication's industry leaders. The results of the survey indicate the pace and extent of the second communications revolution as America moves into the next century.

History of this Study and Forecasting Methodology

In 1992, PCIA completed its first PCS Market Demand Forecast. Since its release, the report has been cited in Congressional hearings, quoted in trade media, examined by Wall Street analysts, and referred to by companies in the telecommunications industry to support market analyses. This year, PCIA updated the findings to reflect new data from over 100 PCS marketing and technical trials conducted in the United States during the last year and a half.

PCIA, which consists of over 450 companies engaged in developing services and products for the personal communications industry, defines personal communications service (PCS) as *"a broad range of individualized telecommunications services that enable people or devices*

to communicate independent of location." The PCS family of services includes New PCS 1800-2200 MHz, cellular, paging, SMR/ESMR, and dedicated data services. It is PCIA's view that PCS services will revolutionize the way people communicate, and bring wireless communications to a mass market through lower priced equipment and service charges.

PCIA solicited information from a qualified "key list" of PCIA member companies from our membership. Respondents include representatives from cellular carriers, paging carriers, network and CPE manufacturers, interexchange carriers, LECs, independent marketing research firms, government research agency data and PCS entrepreneurs. For the purpose of the survey, PCS demand was broken down into eight primary services: New PCS, cellular, paging, SMR/ESMR, dedicated data, satellite, wireless PBX, and cordless phone. Since Wireless PBX and cordless phone are not considered carrier services, this study focuses on the six primary carrier services.

A "key list" of industry experts provided data for each of the eight services regarding total anticipated service penetration, business penetration, equipment and service pricing for Year 1998 and Year 2003 (five and ten year forecasts). Respondents were also asked to indicate if information came from primary, secondary or company estimates. This year PCIA's responses included more primary and secondary estimates, reflecting better data available from market trials.

The methodology PCIA used tracks subscriptions to mobile services, not individual subscribers. The distinction is particularly important when reviewing aggregate subscriptions across services. Total subscriptions will always be greater than total subscribers because many individuals will subscribe to multiple services. Today, for example, there is a growing base of customers that utilize both paging and cellular. As the findings below point out, it is conceivable that PCS will open up new opportunities for customers to use new service offerings with multiple services. Statistical information was calculated using the consensus building Delphi method (removal of the high and low response, and averaging the remaining sample.)

The following primary findings have been prepared as an information resource for PCIA members, the financial community, federal regulatory agencies, and the public.

Primary Findings

The attached "PCS Technologies Forecast" summarizes aggregate statistical findings for the six carrier based services. The primary findings were developed from these findings. The next section lists assumptions PCIA took into account in developing the analyses below.

The primary findings include the following:

- o **All eight PCS Services studied will continue to grow, despite increased competition.** (See attached "PCS Technologies Forecast" page.) Available market research indicates that there is a very high amount of unmet demand for personal communications. Decreasing prices, advanced technologies, and creation of licenses will enable service providers to fill the demand gap.
- o **Multiservice use is expected.** The complementary nature of PCS services will create a market in which users of one wireless service may adopt additional services to enhance overall functionality. For example, cellular users may adopt an alphanumeric pager for message screening and response queuing, or companies with many mobile workers already using PCS may install a wireless PBX. Since PCIA's results show that a person is likely to use multiple services, and the demand for more than one service per subscriber may be high, the forecasts refer to quantity of subscriptions, instead of subscribers.
- o **The respondents see the New PCS as adding new value to the industry.** New PCS is not expected to replace any existing wireless technology studied, although increased competition will certainly affect the growth rate of the other services. Rather, respondents see the new services as adding new value to the industry by complementing existing services, and increasing demand for all wireless services.
- o **A wide array of services is developing, each with its own specific functionalities, service mix and market advantages.** These services each have varying price points and levels of technical complexity.
- o **Residential service growth:** New PCS will be heavily oriented to consumer service. Results show that business penetration for New PCS in Year 5 is a modest 30%, suggesting that New PCS will not necessarily

follow the traditional pattern of business to consumer migration; rather PCS may begin with the non-business or residential customer. Our results also showed paging, and to a lesser extent cellular, further expanding into the residential marketplace.

- o **Data PCS:** As with the landline communications, data will comprise an increasing share of total wireless communications in the future. This was reflected by data services growth in cellular data (anticipated 2.69% penetration in 2003). Voice-plus-incremental-data is a strong component of New PCS demand, and participants projected over 70% of New PCS usage will include some type of data service.

- o **Deployment:** Demand is dependent upon the timing of service deployment. The data illustrates that ESMR will grow earliest followed by CDPD, and finally New PCS voice and data service.

Service Specific Findings

NEW PCS: Although New PCS will clearly start service later than other existing wireless services, dynamic growth is expected to continue for the next decade. With service deployment anticipated for approximately 1995, total penetration is expected to grow to 3.1% by 1998 (8.5 million subscriptions) and reach 10.4% penetration in 2003 (31.1 million subscriptions.) The Year 5 to Year 10 growth rate is projected at 264%, the highest maintained growth rate of the services studied.

PAGING: With a lower price point, demand for paging and messaging services will remain strong. Today's over 19 million subscribers are predicted to grow to 36.8 million by 1998, with a predicted total penetration of about 13%. (This indicates a 1993-1998 increase of 93.7%) Results suggest Year Ten penetration will reach close to 22%, indicating that over 46 million new paging/messaging subscriptions will be registered by 2003, many of which will be consumer or non-business. Paging maintains the largest market share, anticipating 65 million subscriptions in 2003.

CELLULAR: Demand for cellular services will increase dramatically from 13 million subscriptions in 1993 to 33 million in 1998, a 154% increase. Cellular penetration is expected to grow from a reported 5% penetration at year end 1993 to approximately 12% penetration in 1998 and 17.4% penetration in 2003. Cellular is predicted to have the second largest number of subscriptions in 2003: 52 million.

ESMR/SMR: Our respondents predict that ESMR/SMR use will be over 90% business based. Anticipated penetration in Year 5 is 1.9% (5.1 million subscriptions) representing a five year growth rate of about 246%. Year Ten results predict penetration of about 3% (8.9 million subscriptions). Customer premise equipment (CPE) prices are expected to be relatively high, (\$467 average in 1998, dropping to \$275 in 2003). This price level is second only to satellite CPE.

DEDICATED DATA: Anticipated to be positioned primarily for business users, our results show growth from 50,000 subscriptions in 1993, to 3.36 million in 1998, representing an increase of over 6600%. The results forecast about 5.6 million subscriptions by 2003. The

networks will provide added value through increased flexibility and mobility for those businesses that require such services.

SATELLITE: The highest priced of the PCS services examined, CPE price will be \$1200 in 1998. Satellite service will be over 98% business, and will serve about 1.3 million subscriptions by 1998, and over 4 million subscriptions by 2003. Although satellite networks may have the fewest subscriptions of those we examined, the Year Ten growth registers at 211%.

WIRELESS PBX: Wireless PBX data in our survey had a relatively wide variance of responses on CPE price, monthly service charge, and penetration. This may suggest some confusion within the industry about this products' relative positioning. Based on data received this report does not make any conclusions about WPBX services.

CORDLESS: Nominal growth in the cordless market is anticipated, the product will remain a primarily residential product.

PCS Technologies Forecast

1993 - 2003

Service	1993		1998			2003		
	Subs. (millions)	Penetration (% of pop)	Subs. (millions)	Penetration (% of pop)	5 Yr. Subs. % Increase	Subs. (millions)	Penetration (% of pop)	5 Yr. Subs. % Increase
New PCS			8.55	3.1%		31.11	10.4%	263.9%
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%
Dedicated Data	0.5	.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 PCS Services	33.7		88.3		162.4%	167.4		

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)

Assumptions

The following assumptions were used by the survey respondents in formulating their market estimates:

- o Penetration is based on US population figures that assume 1.5% annual growth: 1992 / 255 million; 1993 / 258.5 million; 1998 / 275.8 million; and 2003 / 300.3 million.
- o Recently we received end of year 1993 reported penetration and subscriber figures for New PCS, Satellite, Paging, Dedicated Data, Cellular and SMR/ESMR. Wherever possible, five and ten year growth figures use the 1993 figures as the baseline.
- o Service descriptions and capabilities are based on definitions set forth in the *Telocator (PCIA) Service Descriptions Document for Personal Communication Services*. This document is available at PCIA.
- o We assume the existence of a fully competitive environment, where services coexist simultaneously and the demand for one service may influence the demand for others.
- o Existing services evolve into more mature services possibly offering greater functionality. For example, paging services evolve to advanced paging where customers are offered greater messaging capabilities. The survey matrices listed these services together and a single forecast was requested.
- o Cellular, Advanced Cellular, ESMR, and New PCS share similar service descriptions. Although at the point of licensing these services may not all provide the same set of capabilities, it can be assumed that over time each will meet their full range of capabilities as described in the *Service Descriptions* document.
- o Quantity of subscriptions was used; not quantity of subscribers. For instance, New PCS 1800 and other listed services may include a pager for call notification. Subscribers for such multiple services were counted as both a New PCS 1800 customer, for example, and a paging customer. When a single customer uses more than one type of service, the customer is included in each service count as one subscription.

Additional Note:

Coverage area requirement: The original survey and subsequent analyses did not stipulate a service coverage area requirement, or analyze its effect on demand. The industry knows first hand from PCS market trials, and from experience in cellular and paging, that coverage is one of the most critical factors in demand for a PCS service. In addition, the FCC has mandated that 90% of the population must be covered by the New PCS networks, by Year Ten.

The FCC's Second Report and Order on PCS

On September 23, the FCC's Second Report and Order ruled that the new spectrum in the Emerging Technologies Band would be allocated to the industry for PCS, and designated the market sizes service areas, and eligibility. Seven new spectrum licenses per market are to be auctioned to the public for PCS service within the 1850-1970 MHz band and the 2130-2200 band. Of the licenses, two will be 30 MHz, one will be 20 MHz, and four in the upper band will be 10 MHz. The size of the service area corresponds to the Rand McNally designations of Basic Trading Area (BTA) and Major Trading Area (MTA) for the two 30 MHz licenses in the lower band. The licenses can be aggregated up to 40 MHz total. The Second Report and Order on PCS established operating rules including eligibility criteria for cellular carriers, and establishment of a 90% coverage requirement for PCS carriers by Year 10. For additional details on this ruling, please contact PCIA or the FCC.

Conclusion

The respondents of this survey and the PCIA membership have been waiting in anticipation for the rules and regulation that will govern PCS services to be finalized, so that business strategies and critical decisions can be made. As these important rulings are completed, PCIA is in a constant process of analysis, and we will continue to serve our members and the telecommunications community by producing industry forecasts as needed.

The US PCS industry is fortunate to have an FCC that supports rapid and efficient deployment of a new PCS industry. As New PCS ignites the second "wireless revolution", as paging and messaging services expand to

new markets, as cellular maintains a strong subscriber base and diversifies service offerings, and as ESMR offers new wide area coverage service offerings, PCIA members will continue to inform Wall Street, Congress, federal regulatory agencies, and US industry on technical and market developments that affect the wireless industry.

For more information, please contact the Personal Communications Industry Association at 202 467 4770 voice or 202 467 6987 fax.

1994 PCS Market Demand Forecast

Personal Communications Services (PCS)
is defined by PCIA as " a broad range of individualized telecommunications services that enable people or devices to communicate, independent of location."

PCS technologies examined in this report include:

- **New 2 GHz PCS**
- **Satellite**
- **Paging**
- **Dedicated Data**
- **Cellular**
- **SMR/ESMR**

This report shows projected demand for PCS Services subscriptions for Year Five (1998) and Year Ten (2003).

The results were derived from a PCS industry survey conducted over 4 months by the Personal Communications Industry Association (formerly Telocator).

Over 30 companies involved in PCS responded to the survey.

Results are provided in terms of population based penetration and quantity of subscriptions for each service.

Primary Findings

- All 8 services will continue to grow despite competition.
- Multiservice use is expected.
- New PCS adds new value to industry ("whole pie grows").
- Wide variety of service offerings is expected.
- High potential for residential service growth exists.
- Data PCS - 70% of new services are expected to offer data.
- Timing of service deployment is expected to affect demand for specific services.

Total 1993 Subscriptions

