

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )  
)  
Amendment of Parts 2 and 90 of )  
the Commission's Rules to Allocate )  
Spectrum To Accommodate Advanced )  
Private Land Mobile Communication )  
Services )

RM- \_\_\_\_\_

*PRM*

To: The Commission

PETITION FOR RULE MAKING

Filed by the

COALITION OF PRIVATE USERS  
OF EMERGING MULTIMEDIA  
TECHNOLOGIES

December 23, 1993

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## SUMMARY

The Coalition of Private Users of Emerging Multimedia Technologies (COPE) requests the Commission to initiate a rulemaking proceeding to allocate 75 MHz of spectrum, in the aggregate, for the development of an "Advanced Private Land Mobile Communications Service." This service would support communications systems designed to meet the unique needs of the private radio user community for advanced wireless imaging and decision processing/remote file access capabilities. The members of COPE represent the vast majority of licensees in the Public Safety, Industrial and Land Transportation Radio Services under Part 90 of the FCC's Rules.

While the Commission's recent decision allocating spectrum for the development of Personal Communications Services (PCS) will provide adequate spectrum to accommodate carrier-provided emerging technology services, there is a clear and compelling need for a separate allocation of spectrum to accommodate private emerging technology requirements that cannot be met by carrier-provided PCS systems. Further, existing private land mobile frequency allocations are insufficient to accommodate private emerging technologies, and even the adoption of new technologies under the Commission's "Part 88" proposals will not provide sufficient new spectrum for development of advanced private communications technologies.

An allocation of spectrum as proposed by COPE is integral to the advancement of major policy initiatives of the Clinton Administration in the areas of crime control, energy conservation and management, emergency response and rescue, health care, pollution control, and improved industrial productivity. COPE contemplates that these same or similar applications might be desired by Federal users, and suggests that a shared government/non-government allocation would facilitate the development of equipment that could be used by either private sector users or Federal agencies.

Such an allocation would also meet Congressional mandates, contained in the 1993 Budget Act, directing that the FCC and the National Telecommunications and Information Administration (NTIA) perform joint spectrum planning with respect to "future spectrum requirements for public and private uses, including state and local government public safety agencies."

COPE requests an allocation of spectrum below 3 GHz in the vicinity of the 2 GHz band, and specifically suggests spectrum to be reallocated from the Federal government as required by the 1993 Budget Act. Allocation of spectrum for an Advanced Private Land Mobile Communications Service on a shared government/non-government basis would also be consistent with the Budget Act's provisions on "mixed-use" allocations.

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**PETITION FOR RULE MAKING  
OF THE  
COALITION OF PRIVATE USERS OF EMERGING MULTIMEDIA TECHNOLOGIES**

The Coalition of Private Users of Emerging Multimedia Technologies ("COPE"), pursuant to Section 1.401(a) of the Rules and Regulations of the Federal Communications Commission, 47 C.F.R. Section 1.401(a), respectfully requests that the Federal Communications Commission allocate 75 megahertz of spectrum, in the aggregate, to establish a Private Land Mobile Advanced Communications Service.<sup>1</sup> This Private Land Mobile Advanced Communications Service would support systems designed to

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<sup>1</sup> The Coalition intends the phrase "Advanced Aviation and Private Land Mobile Communications Service" to refer to the application of emerging multimedia technologies to satisfy communications requirements that are uniquely characteristic of traditional aviation, public safety, industrial, business and land transportation operations. When referring to emerging technologies, the Coalition uses the term "multimedia" in recognition of the fact that the needs of these users are no longer limited to voice communications but have expanded to include video, graphics, digital data, and other media. The term "Private Land Mobile Communications Service" denotes internal-use communications systems that are licensed to the actual users of the systems and controlled and operated by those users/licensees.

accommodate the needs of the private land mobile radio user communities for advanced wireless imaging and decision processing/remote file access systems.

## I. INTRODUCTION

1. The Coalition of Private Users of Emerging Multimedia Technologies consists of a broad number of private land mobile users and user associations representing many of the entities who require dedicated private communications systems currently licensed under Part 90 of the Commission's Rules. Specifically, the membership of COPE includes:

- American Petroleum Institute ("API")
- American Trucking Associations, Inc. ("ATA")
- Association of American Railroads ("AAR")
- Association of Public-Safety Communication Officials-International, Inc. ("APCO")
- Forest Industries Telecommunications ("FIT")
- Industrial Telecommunications Association, Inc. ("ITA")
- International Association of Fire Chiefs, Inc. ("IAFC")
- International Municipal Signal Association ("IMSA")
- Manufacturers Radio Frequency Advisory Committee, Inc. ("MRFAC")
- National Association of Business and Educational Radio, Inc. ("NABER")
- Utilities Telecommunications Council ("UTC")

2. Members of COPE operate or represent operators of private land mobile radio systems and, as a result, recognize that these private radio systems are an integral and indispensable part of their ongoing business, industrial, public safety and public service operations. COPE is therefore dedicated to securing sufficient spectrum to support the development and growth of dedicated private emerging technology

systems to meet the highly specialized communications requirements of its members into the next century.

3. In the current environment, the most likely source of spectrum to accommodate private emerging technology needs lies in the spectrum to be reallocated by the Federal Government for non-government use under the Omnibus Budget Reconciliation Act of 1993.<sup>2</sup> COPE believes that the instant Petition is congruent with and complementary of Congressional efforts to reallocate Federal spectrum for private use. In this regard, the instant Petition: (1) provides a mechanism which the Commission could use as the focal point for exploring the public's need for an allocation of spectrum to accommodate private emerging technology systems; and (2) serves as an impetus for exploring ways in which radio systems, services and technologies developed to accommodate the emerging needs of private user entities could be adapted to meet the requirements of federal government agencies.

## II. BACKGROUND

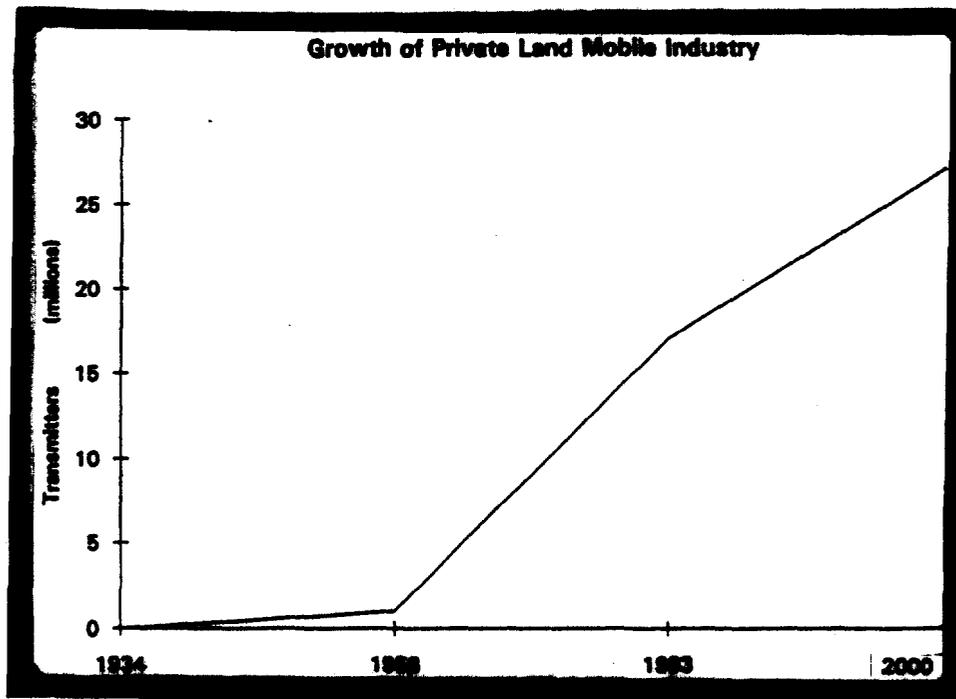
4. Today, there are more than 33,000,000 private land mobile radio transmitters in operation throughout the world. Over half of these transmitters are located in the United States. Private land mobile transmitters in the United States have

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<sup>2</sup> Pub. L. No. 103-66, 107 Stat. 312 (1993), hereinafter referred to as the "Budget Act."

increased from approximately one million units in 1958 to over 17,000,000 today. During this thirty-five year period, the growth in use of land mobile radio has continued unabated, even with the emergence of cellular radio.

5. As depicted below, the growth of the private land mobile industry is expected to continue on a dramatically upward trend into the next century. The number of licensed transmitters is projected to double in less than eight years.<sup>3</sup>



Since 1982, the number of private land mobile transmitters in use

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<sup>3</sup> FCC Notice of Inquiry, PR Docket No. 91-170, adopted June 13, 1991, 6 FCC Rcd. 4125 [hereinafter "Inquiry"], ¶¶ 17-19.

in the United States has increased by 10,000,000 units, equivalent to the growth in cellular subscriber units during the same period. The frequency bands below 470 MHz account for more than 40% of this growth, with an increase of more than four million units between 1985 and 1991.<sup>4</sup> By the year 2000, the industry estimates that there will be more than 27,000,000 private land mobile radio transmitters in use. While refarming the existing bands may help to accommodate the growth in users, bandwidth-intensive uses such as data and imaging will require additional allocations.

6. As the Commission has clearly recognized, the emerging mobile communications technologies represents the next telecommunications "frontier." Emerging technologies will revolutionize the way industry and society functions. The Commission's earlier allocation decisions in Docket Nos. 90-314 and 92-9 have provided adequate spectrum to accommodate carrier-provided personal communications services.<sup>5</sup> However, there is a clear and compelling need for an allocation of spectrum to accommodate private emerging technology requirements that cannot

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<sup>4</sup> Remarks of John Major, Vice President and General Manager, Worldwide Systems Group, Motorola, Inc. at the FCC/Annenberg Conference on "Refarming the Spectrum", November 14, 1991.

<sup>5</sup> As noted in the Second Report and Order in GEN Docket No. 90-314, adopted September 23, 1993, 8 FCC Rcd. 7700 [hereinafter "Second Report and Order"], the Commission's allocation of 160 megahertz for PCS services is four times the spectrum originally allocated for the cellular telephone service.

be served by carrier-provided PCS systems.

7. At the time of the Notice of Proposed Rule Making in ET Docket No. 92-9<sup>6</sup>, the Commission's clear intent was to allocate spectrum to accommodate several different emerging technologies. While the Commission anticipated "that the first use of these emerging technologies bands will be for the creation of a new personal communications service (PCS)"<sup>7</sup>, the Commission also expected that the emerging technologies allocation would "foster the development and implementation of [other] new technologies and services."<sup>8</sup>

8. When adopting the First Report and Order and Third Notice of Proposed Rule Making in ET Docket No. 92-9, the Commission anticipated that its decision to reallocated 220 megahertz of spectrum for emerging technologies would "make possible the operation of a broad range of new communications services that employ emerging technologies."<sup>9</sup> The Commission stated, further, that "(t)he new services expected to operate on

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<sup>6</sup> Notice of Proposed Rule Making (FCC 92-20), adopted January 16, 1992, ET Docket No. 92-9, 7 FCC Rcd. 1542 (1992) [hereinafter "Emerging Technologies Proposal"].

<sup>7</sup> Id., ¶ 29.

<sup>8</sup> Id., ¶ 30.

<sup>9</sup> First Report and Order and Third Notice of Proposed Rule Making, ET Docket No. 92-9, adopted September 17, 1992, 7 FCC Rcd. 6886 (1992) [hereinafter "Emerging Technologies Allocation"].

these frequencies will provide the American public with enhanced personal access to communications services and enable businesses to realize increases in productivity."<sup>10</sup>

9. The First Report and Order and Third Notice of Proposed Rule Making in ET Docket No. 92-9 also left open the possibility of using the 220 megahertz allocated for emerging technologies to accommodate a variety of new uses, including uses specifically designed to serve the needs of American industry. The Commission stated:

demand, not our predictions, should dictate what services eventually operate in the bands we are reallocating in this proceeding. We do not want to predefine all services and specific technologies that might operate in these bands, as we believe this would defeat our goal of conserving suitable spectrum to foster development of new technologies that will allow U.S. industry to move quickly and keep pace with telecommunications developments throughout the world.<sup>11</sup>

10. Given the magnitude of the Commission's allocation for carrier-provided PCS systems, there is, at this point, little spectrum available from the emerging technology bands for private dedicated systems. This situation would be tolerable to industry and public service users if their emerging technology needs could be satisfied using carrier-provided PCS. However, this is not possible. For many of the same reasons that compelled the FCC to

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<sup>10</sup> Id.

<sup>11</sup> Id., ¶ 39.

allocate spectrum for individual private radio systems in Docket No. 8658<sup>12</sup>, it will be necessary for the Commission to allocate spectrum specifically to accommodate individual private user systems.

11. COPE suggests that an allocation of either Federal Government or non-government spectrum would be appropriate. COPE believes that Congressional guidance is sufficiently flexible to permit the Commission to allocate, for private user emerging technology services, the spectrum to be made available by the Federal Government in response to the Budget Act. Indeed, dedicating Federal Government spectrum for private emerging technology systems would help to advance many of the spectrum utilization goals articulated by Congress in the Budget Act.

12. Underlying the Budget Act is Congressional concern with satisfying the future need among private users for additional spectrum. In this regard, Section 112 of the Budget Act directs the FCC and the National Telecommunications and Information Administration ("NTIA") to perform joint spectrum planning with respect to "the future spectrum requirements for public and private uses, including State and local government public safety agencies." Section 113 of the Act directs that the Federal

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<sup>12</sup> Report and Order in the Matter of General Mobile Radio Service, Docket No. 8658 et al., adopted April 27, 1949, 13 FCC 1190 (1949) [Report of Order allocating frequencies for private industrial and public safety use in the bands 25-50 MHz, 152-162 MHz, and 450-460 MHz].

Government spectrum designated for reallocation should promote the development and use of new communications technologies.

13. The allocation of spectrum proposed in the instant Petition will serve the public interest in a very broad sense by promoting wider and more beneficial use of the radio spectrum. The allocation would help to promote major policy initiatives of the Clinton administration in the areas of crime control and fire prevention, energy conservation and management, emergency response and rescue, health care, pollution control, and improving industrial productivity.

14. Viewed more narrowly, the instant Petition will promote the Congressional objectives enunciated in the Budget Act. Specifically, the Petition: (1) provides a basis upon which the FCC can initiate a proceeding to consider the spectrum requirements of all private users; (2) provides a basis for further study by the NTIA and the Commission of those emerging technology applications "most likely to have the greatest potential for productive uses and public benefits under the 1934 Act"<sup>13</sup>; and (3) would promote "the development and use of new communications technologies."<sup>14</sup>

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<sup>13</sup> Budget Act, Section 113(a)(5).

<sup>14</sup> Id.

**III. THERE IS A CRITICAL NEED FOR A DISCRETE  
PRIVATE EMERGING TECHNOLOGIES ALLOCATION.**

15. The availability and dependability of private land mobile communications is one of the primary factors which has allowed the United States to establish and maintain its position as the world's leading producer of goods and services. Private land mobile radio is used by all segments of the industrial, business, public safety, public service and land transportation mobile work force. Private land mobile systems have become an indispensable part of the operation of this work force.

16. The continued growth of this nation's commercial and public service activities demands additional communication capabilities. It is imperative that the industrial and public safety sectors have access to new imaging and decision processing/remote file access technologies. Even with the availability of personal communications services offered by private and common carriers, public safety, public service and industrial users will continue to satisfy their specialized communication requirements through private systems.

17. The private land mobile radio user community is a necessary ingredient in maintaining global competitiveness. Motivated by the constant need of the private sector to improve productivity and service, private users will invariably migrate to the specific communications solutions which provide the

greatest advantage to their operations. An additional allocation of radio spectrum is essential if these users and their industries are to continue to flourish in increasingly competitive global markets.

18. As recognized by the International Chiefs of Police,<sup>15</sup> key technological advances such as digital signal processing are bringing about a radical shift in private land mobile radio technologies. These technological advances dramatically increase the effectiveness of emergency response teams in saving lives and protecting property. The nature of the information being collected and distributed throughout the country and transmitted to and from the field forces is rapidly changing from traditional voice and data dispatch to decision processing/remote file access, imaging and video.<sup>16</sup> Comparable changes are taking place in other industrial, commercial and public service arenas.

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<sup>15</sup> Resolution on "Frequency Requirements for New Technology" adopted by the International Association of Chiefs of Police at their October 28, 1992 Annual Conference in Detroit, Michigan.

<sup>16</sup> The Federal Bureau of Investigation has recently advised public safety agencies throughout the United States that it is in the process of upgrading its National Crime Information Center NCIC-2000 System. When this project is completed, the System will be able to transmit images of fingerprints, mug shots, stolen objects, contraband and personal property between the FBI's headquarters and a police patrol car. The widespread use of this System will not be possible, however, unless additional spectrum is available to support the timely delivery of the images to mobile units.

19. Reliance on data communications systems is expected to increase five-fold during the next few years. The evolution within the computer industry from terminals to smart terminals to sophisticated personal computers to lap top, palm top, and pen-based computers will demand full mobility and require the corresponding radio interconnection.

20. Based on the needs that have been identified by its user groups, COPE believes that the demand for private user emerging technology systems of the future will likely be dominated by video-oriented, multimedia services. In this sense, private user emerging technology systems will be fundamentally different than the vast majority of consumer-oriented, carrier-provided PCS services. Carrier-provided PCS systems will invariably focus on services intended to serve the voice and data needs of the general populace.

21. Some of the unique services COPE anticipates will be required to serve the critical, day-to-day operational needs of industrial, public safety and public service organizations include:

**Crime Control and Fire Prevention**

- a. Mobile transmission of fingerprints, mug shots, warrants and other images to and from law enforcement field personnel
- b. Mobile transmission of maps, floor layouts, and architectural drawings for crime-in-progress operations

- c. Tactical use of live mobile video for hostage, arrest and surveillance operations
- d. High resolution graphics and electronic transfer of maps and other graphic information to police vehicles
- e. Vehicle and personnel tracking systems
- f. On-board information and security systems for mass transit vehicles

#### **Energy Conservation and Management**

- a. Advanced distribution automation (remote monitoring, coordination and operation of distribution and transmission components from centralized locations, including load management, advanced metering and system control functions)
- b. Demand side management ("DSM") systems (e.g., managing the consumption of electric power and natural gas)
- c. Transmissions to monitor and record pipeline flow and pipeline pressure indicators
- d. Real-time monitoring, alerting and control in situations involving handling of hazardous materials

#### **Health Care**

- a. Remote monitoring of patients' vital signs in health-care facilities to provide continuous patient monitoring and immediate response in the event of a patient crisis
- b. Mobile transmission of maps, floor layouts, architectural drawings to assist firefighters and other response personnel in the rescue of individuals involved in emergency situations
- c. Transmission of visual signals and physician instructions in support of rescue operations
- d. High-speed transmission of high-resolution medical imagery and data from paramedics to hospitals
- e. Automated inventory control

### Pollution Control

- a. High resolution graphics and electronic transfer of maps and other graphic information to mobile users
- b. Management and remediation operations following spills or other crises
- c. Real-time monitoring, alerting and control in situations involving handling of hazardous materials
- d. Visual inspection of pipes and cables exposed during excavation projects

### Improving Industrial Productivity

- a. Automatic transmission of messages advising of impending shortages of parts in a manufacturing environment
- b. Vehicle and personnel tracking systems
- c. Remote safety and security inspection of inaccessible locations
- d. Automation of process and quality control functions
- e. Real-time monitoring, alerting and control in situations involving handling of hazardous materials
- f. Transmission of scheduling and cost updates, job site inspection results and performance assessments relating to construction projects
- g. Wireless face-to-face conferences between in-house production and sales personnel

22. There will also be a variety of special "niche" requirements that, by virtue of their highly specialized environment and exacting reliability requirements, will tend to be incompatible with consumer-oriented, carrier-provided PCS services. For example, a variety of advanced technology services will be required to ensure the safety and effective functioning

of both underground and elevated transit and rapid rail transportation systems. In addition, there will be very specialized requirements for other industrial and public safety operations conducted in underground environments.

23. Further, there will be a requirement for special wideband video and data systems designed to provide highly reliable communications networks in inherently dangerous settings. Private user emerging technology systems will fulfill a critical role in ensuring the safe and efficient functioning of maintenance crews, fuel and other service personnel working on highly congested flight lines.

**IV. THE COMMERCIAL PCS CONCEPT ENVISIONED BY THE COMMISSION WILL NOT ACCOMMODATE THE CRITICAL MOBILE NEEDS OF PRIVATE USERS.**

24. The Commission's recent spectrum allocation for PCS will not satisfy the need for spectrum for private emerging technologies. The regulatory scheme adopted for PCS makes it impractical, if not impossible, for private users to obtain and use their own PCS licenses for the new telecommunications technologies they need. Moreover, PCS carrier-licensees will not meet the special needs of most private emergency technology users.

**A. The PCS Allocation Structure, Based on MTA/BTA Licensing, Is Not Compatible With User-Operated Emerging Technology Systems.**

25. The Commission's new PCS regulations are intended to create broad consumer-oriented businesses that serve large geographic areas and customer bases. Licenses will be awarded to the highest bidder and licensees may face substantial costs to relocate existing microwave users from the PCS frequency bands. The Commission is also requiring that PCS licensees serve a significant percentage of the population within their service area by a specified time period. These and other economic, technical and regulatory constraints on PCS make it incompatible with private dedicated emerging technology systems.

26. PCS licenses will be issued through competitive bidding and, as such, will be beyond the financial reach of private users. The highest bidders in these auctions will almost certainly be entities intending to use PCS licenses for subscriber-based, revenue-raising services. They alone will be able to justify the millions of dollars needed to obtain a license through an auction. Even the statutorily mandated PCS "set aside" is intended for minorities, women and small businesses offering PCS services on a commercial basis. Private users, in contrast, seek spectrum to provide communications services that support or enhance their own activities (e.g., law enforcement, fire prevention, emergency medical services, power generation, petroleum and natural gas production and

distribution, manufacturing, transportation, agriculture and other business activities). Most private users operate communications systems to support their primary activities. Private users typically do not have the resources to bid for spectrum (e.g., state and local government public safety agencies) or are not in a position to offer communications service on a for-profit basis.

27. PCS licenses will have geographic boundaries, with each license covering a Basic Trading Area (BTA) or Major Trading Area (MTA), neither of which have any relationship to the areas that private users need to serve. Private users either serve a specified political jurisdiction (e.g., public safety agencies) or designated regions (e.g., utilities), and/or have site-specific applications (e.g., factories and farms). Therefore, a license covering a BTA or MTA is likely to be either too large, too small, or otherwise inappropriate for the specialized requirements of private users.

28. Finally, the Commission has imposed construction deadlines on PCS licenses that also contemplate that PCS will be a broad-based subscriber-oriented service. A PCS licensee must serve one-third of the population within its BTA or MTA within five years, two-thirds within seven years and 90 percent within ten years. This, of course, is a meaningless obligation for a private user with no desire or intent to serve the entire

population.

29. Therefore, private users cannot be expected to become PCS licensees. Nor will private users' needs be satisfied through the spectrum allocated for unlicensed PCS. Most of the private technologies described in this Petition cannot operate with the restricted power and other technical limits that the FCC has necessarily imposed on unlicensed PCS equipment. Moreover, the inherently undisciplined environment of unlicensed RF devices is incompatible with the critical needs of many private users, especially those involved in public safety and other critical safety-oriented activities. While the etiquette adopted by the Commission may be adequate for many consumer applications and some business applications as well, unlicensed operation does not provide the requisite level of discipline and certainty required for critical private radio communications.

**B. Carrier-Provided PCS Services Are Inadequate To Meet The Demands Of Private Emerging Technology Applications.**

30. The licensed PCS industry is likely to offer a wide variety of services to subscribers, including sophisticated data and voice communication. Nevertheless, the PCS industry will not meet private users' need for unique applications or for geographic coverage inconsistent with PCS service areas and development. Nor will PCS carriers provide the degree of unrestricted priority access, reliability, and security that many

public safety and other private users demand.

31. Initially, PCS is expected to compete with cellular for mobile voice communication, eventually providing various data services as well. Nevertheless, PCS is unlikely to ever provide the specialized and highly sophisticated services needed by private users. The market for such unique applications is simply too small for public, consumer-oriented businesses such as PCS. Public systems also have difficulty in quickly implementing the latest technology because of their large investment in existing plant and equipment. Individual private users, in contrast, are able to adapt more rapidly to their own specific needs. In any event, the technical parameters of PCS may inhibit its ability to offer services such as full motion video and high definition imaging in an efficient manner, if at all.

32. Even if PCS has the technical capability to provide certain services needed by private users, PCS will never reach all the areas where such services are needed. Economics will limit PCS initially, if not permanently, to major urban areas. Subscriber-based PCS, with complex microcell technology, may never reach rural and other sparsely populated remote locations. Therefore, even if PCS technology could otherwise meet certain private user needs, it will be of no help to State-wide and rural public safety agencies, or to remote power generation, petroleum production, manufacturing, mining and food processing facilities.