

*in a vehicle mounted mobile unit and cumbersome dialing patterns with the IMTS system. As a result, the use of the cordless telephones was viewed as an extension of the main wireline service and mobile service had a much lower penetration level than is currently exhibited with cellular systems. The improvement in both hardware and service provision has alleviated most of the limitations associated with IMTS, with an attendant marked increase in subscription to service. Today, there are approximately 13 million cellular telephones in service.*

*The trend toward a service economy, with its mobility requirements and desire by users for immediate access and availability to their constituencies (whether it be office, suppliers or customers), has imposed much higher demands on the wireless industry. As a result, several types of services are available to the general public or are in the development stage.*

*Alternatives Include:*

- 1. Cordless Telephones (CT2 standard) - This technology has been available in analog radio form for several years and more recently in digital form. Advantages are low cost, one telephone number and easy deployment, since this is a customer premise equipment based technology. Disadvantages include limited geographic coverage due to the inability to roam to any foreign base station, interference problems due to the frequencies used and limited privacy because of the limited number of channels available.*
  
- 2. Cellular Telephone Service (FCC DPCRTS standard) - This technology has been available in analog radio form since approximately 1983 with nearly complete coverage in Minnesota today. (See Appendix XI). This system is just beginning to be deployed in a digital format in the United States. The digital cellular network, when deployed, will be the Cadillac of available technologies in that it has the advantages of being available in either mobile or portable forms, is easily deployed from the subscriber's standpoint (no connections are necessary; merely acquire the set), is a fully featured service, provides one number access, has high channel capacity, provides extremely clear quality, is relatively private for an over the air service, and is available in most areas. These advantages come at a high price for both the subscriber equipment and service and are complicated by hurdles generated by industry standards groups, legislators and jurists.*

3. *Personal Communications Service (CT3 and other standards) - This standard, which is really an amalgamation of several existing technologies (CT2, paging, voice mail, etc.) is currently under trial in several U.S. locations by several prospective suppliers.*

*MCI Telecommunications Corporation will form a broad based consortium of companies to seek an FCC license for a nationwide personal communications network.*

*In the past year, four cable television company operators have devised tests for personal communications services. The tests are designed to demonstrate that cable plant can provide portable telephone service efficiently. Tele-Communications Inc. and McCaw Cellular are testing PCS in Ashland, Oregon; Cox Enterprises is testing PCS in San Diego; Comsat is testing it in Trenton, New Jersey; and Cablevision Systems Corporation is testing it in Lynbrook, New Jersey.*

*GTE Corporation is conducting a 15 month test of personal communications services involving 3,000 customers in Tampa, Florida.*

*PCS is promising to be a low cost, high feature service enabling a user many of the advantages listed for cellular. Lower cost is proposed to be achieved through use of lower power units (meaning less range), smaller coverage areas and elimination of some of the roaming, hand-off and call delivery functions standard with that technology. Thus this technology is targeted at a market which is intended to be locally portable, not highly mobile.*

#### PCS Licensing<sup>6</sup>:

*PCS licensing was authorized through the Omnibus Budget Reconciliation Act to the FCC to use competitive bidding to award PCS licenses. On September 23, 1993, as a first step in the process, the FCC allocated 160 MHz in the 2 GHz emerging technologies bands for PCS. The Commission allocated 40 MHz for unlicensed PCS devices.*

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<sup>6</sup>The following information is reprinted with permission from the October 4, 1993 issue of the Washington Weekly Report, Copyright

*1993, Organization for the Protection and Advancement of Small Telephone Companies.*

*This allocation was channelized into two 20 MHz blocks. One block is for devices that will provide voice-like services (isochronous: 1890-1900 and 1920-1930 MHz), and the other block is for devices that will provide data-like services (asynchronous: 1900-1920 MHz).*

*The remaining 120 MHz was allocated for licensed PCS services. It was channelized into two MHz blocks, one 20 MHz block and four 10 MHz blocks. The Commission adopted Major Trading Areas (MTAs) as the service area size for the two 30 MHz blocks. The service areas adopted for the one 20 MHz and four 10 MHz blocks were Basic Trading Areas (BTAs). There are 51 MTAs and 492 BTAs, as defined by the Rand McNally Atlas. (See Appendix XII). The channel blocks, frequencies, and service areas for the licensed PCS allocation follow:*

<u>Channel</u>	<u>Block</u>	<u>Frequency (MHz)</u>	<u>Service Area</u>
A	(30 MHz)	1850-1865/1930-1945	MTA
B	(30 MHz)	1865-1880/1945-1960	MTA
C	(20 MHz)	1880-1890/1960-1970	BTA
D	(10 MHz)	2130-2135/2180-2185	BTA
E	(10 MHz)	2135-2140/2185-2190	BTA
F	(10 MHz)	2140-2145/2190-2195	BTA
G	(10 MHz)	2145-2150/2195-2200	BTA

*The FCC believes that this scheme will ensure competition and foster diversity among providers and services. The licensing term is set for ten years and renewal requirements will be similar to those for cellular license renewals. To reduce speculation, the FCC proposed that interested parties put a portion of the license money "up front" to participate in the auction. Licenses can aggregate up to 40 MHz in any one service area (unless they are subject to the cellular restriction - see below) and can aggregate markets. There are also build-out requirements. The PCS licenses will be required to offer service to at least one-third of the population in each market area within five years, two-thirds within seven years, and 90 percent within 10 years.*

*Rural Telephone Companies Given Special Preference:  
The Omnibus Budget Reconciliation Act requires the FCC to include*

safeguards in its auction process to ensure development and rapid deployment of the new services to the public, including those in rural areas. The FCC also is required to distribute the licenses among a wide variety of applicants, including small businesses, businesses owned by members of minority groups and women, and rural telephone companies. The 20 MHz "C" block has been designated as the channel block for these four entities. One of the 10 MHz blocks may also be designated for them. The FCC also is seeking comment on setting aside blocks of spectrum for competitive bidding by the four designated groups, spreading the payment of the license over time, and requiring less money "up front." The FCC has not defined rural telephone company and will seek proposals of appropriate definitions in a separate rule making.

**Cellular Restrictions:** Many believed that cellular providers would be prohibited from providing PCS in their service areas. While there are some restrictions, they are not as far reaching as was first anticipated. Cellular licensees are permitted to participate in PCS outside of their existing service areas. The cellular licensee may also participate in any area (including their own service areas) where they serve less than 10 percent of the population of the PCS service area. For purposes of this rule, cellular licensees are defined as entities which have an ownership interest of 20 percent or more in a cellular system. Cellular licensees are also afforded the opportunity to compete for one of the existing 10 MHz channels in their existing service areas. Except to the extent that they are cellular licensees, and subject to those restrictions, LECs will be allowed to apply for the licenses on the same basis as other applicants.

**Disagreement at the Commission:** Beyond the basic framework, the FCC was not unanimous in its decision. More details and clarification are expected when the order is released.

#### Future Trends:

Wireless usage is growing rapidly (at the rate of 11,000 users per day nationally in the cellular sector). As a result, radio spectrum requirements are being generated well beyond original estimates by either the industry or the FCC (original projections were for 900,000 subscribers by the year 2000). Spectrum management methods are currently being developed as noted above. Industry and FCC trends are toward assignment of radio spectrum for narrowband uses (voice and low speed data) while migrating broadband (video and high

speed data) to terrestrial transport methods such as fiber or coaxial cable. Speculation is that broadcast video and voice will literally exchange their respective methods of delivery, wire vs. airwaves, in the future.

**Recommendation:**

*The committee recommends that the deployment and development of the wireless communications infrastructure be left to the market demand for the service.*

**G. Potential Regulatory Issues**

*As described above, one of the benefits of the Market Demand/Deployment Scenario is that it will preserve an environment where competition among providers of advanced communications or information services may develop. For example, cable companies could compete with local companies to bring fiber to the home and the advanced communication services which go with it. As this type of new market structure develops, regulation will need to change and adapt in order to insure that customers receive the same quality of service at reasonable prices and to provide a fair competitive opportunity for regulated entities. If that type of market results from the Market Demand/Deployment Scenario, the following issues should be addressed:*

*Exclusive Franchise:* *Today, an LEC is granted an exclusive franchise for the territory it serves. If the Commission grants certificates to additional companies to provide substitutable services in the same territory as an existing provider, the exclusive franchise may erode and eventually disappear. Entities receiving certificates to provide service should assume both rights and obligations. Obligations, such as for universal service, should be shared on an equal basis by all providers.*

*Quality of Service:* *Today, Commission rules and monitoring ensure the quality of service to the consumer. If competitive suppliers enter the market, customer choice may be sufficient to insure acceptable levels of service. However, with a vital service such as telecommunications, some quality of service oversight will continue to be in the public interest.*

Fair and Equitable Competitive Opportunities: In a competitive environment, all existing and potential competitors must have equal opportunity to compete. Inappropriate entry and exist barriers caused by legal and regulatory rules should be eliminated or modified so that all players are impacted similarly. The determination of what is "fair and equitable", and how fast transition should take place for various groups of services, are issues to be dealt with by the regulators. Furthermore, government owned networks that would compete with the public switched network should not be constructed.

Interconnection Issues: Interconnection must be required to the maximum extent technologically feasible. Reasonable and consistent technical standards must be developed to insure maximum interconnectability. Regulators will need to address interconnection and compensation issues between providers during the transition to full and open competition.

Investment and Earnings: If a fully competitive market exists so that a sufficient number of providers are present to ensure that prices are driven to cost, regulation of companies' earnings should be lessened. Customer demand and the opportunity for increased revenues will drive the providers' investment strategies and pricing will be determined by customer demand and production costs.

### Regulatory/Legislative

Louisiana has an excellent opportunity to incorporate existing and emerging wireless technologies into its telecommunications infrastructure. Technology will be available for deployment since some of the finest scientists in the world are developing new wireless products daily.

The economic environment that faces each carrier will govern the speed of technology deployment. New rules and regulations are being formulated at a Federal level that will have a great impact on all providers. A synopsis of those issues currently being discussed follows.

### **Technological Convergence of Wireless, Computers**

As technologies converge, traditional regulatory boundaries are blurring and disappearing. For example, the Federal Communications

*Commission's (FCC) approach to licensing radio frequencies historically was to divide the spectrum into different uses. One frequency group was designated for dispatching automotive fleets (specialized mobile radio). Another set of channels was reserved for one-way messaging signals (paging), while another group of frequencies was set aside for cellular telecommunications, and so on.*

*Just recently, however, the FCC allocated 160 MHz of spectrum in the 2GHz band for a "family" of PCS services, only specifying that 40MHz of the spectrum would be for unlicensed purposes. But the FCC did not designate any particular services.*

*The old communications labels are becoming blurred and, in some cases, useless.*

*The Omnibus Budget Reconciliation Act of 1993 created a new classification system for mobile service, defining two broad general categories: Commercial Mobile Service, and Private Mobile Service.*

*A new section of the Communications Act defines Commercial Mobile Service as "any mobile service (as defined in section 3 (n) that is provided for profit and makes interconnected service available (A) to the public or (B) to such classes of eligible users as to be effectively available to a substantial portion of the public, as specified by regulation by the Commission.*

*The Communications Act was also amended to provide the following definition of mobile service":*

*'Mobile Service' means a radio communication service carried on between mobile stations or receivers and land stations, and by mobile stations communicating among themselves, and includes (1) both one-way and two-way radio communications services, (2) a mobile service which provides a regularly interacting group of base, mobile portable, and associated control and relay stations (whether licensed on an individual, cooperative, or multiple basis) for private one-way land mobile communications by eligible users over designated areas of operation, and (3) any service for which a license is required in a personal communications service established pursuant to the proceeding entitled 'Amendment to the Commission's Rules to Establish New*

*Personal Communications Services' (GEN Docket No. 90-314; ET Docket No. 92-100), or any successor proceeding.*

## **NEW RULES FOR COMMERCIAL MOBILE RADIO SERVICE**

### **FCC RULES ISSUED**

*On Thursday, February 3, the FCC took the first steps to implement the new regulatory scheme for mobile radio services by carrying out the requirements set forth by Congress in the 1993 Omnibus Budget Reconciliation Act. As enacted, the law amends Section 332 of the Communications Act by establishing new rules for Commercial Mobile Radio Services (CMRS) and providing the framework for the competitive mobile communications market.*

*As noted in the FCC press release, the "order reflects the Commission's efforts to implement the congressional intent of creating regulatory symmetry between similar mobile services and to avoid imposing unwarranted regulation upon even those services classified as CMRS."*

*In its rulemaking, the Commission addressed two principle issues: (1) classification of existing and proposed mobile services as either CMRS or private mobile radio services; and (2) which provisions of Title II should not be applied to CMRS.*

*Using the three pronged test for CMRS providers as stated by Congress, the Commission determined that the following services are classified as CMRS: All cellular, common carrier paging, 800 MHz air-to-ground; PCS - both narrow band and broad band; SMR providers if they offer interconnected services, Enhanced Specialized Mobile Radio (ESMRs); business radio services that provide for profit interconnected service; and private carrier paging if it is providing a for profit interconnected service to the public. Under the Act, service is considered a CMRS if it meets the following test: (1) the service must be provided for profit; (2) the service must be interconnected; (3) the service must be offered to the public.*

*The 1993 budget act also granted the Commission the authority to forbear from certain Title II regulations for CMRS. According to the Commission, it found that forbearing from certain regulations will "help promote competition" and "maximize market competition." Accordingly, the Commission will forbear from: enforcing any tariff*

*filing and/or rate regulation; requirements to file intercarrier contracts; and, Commission approval relating to market entry and exit for CMRS providers.*

*In its rulemaking the FCC also announced that it will issue one or more further rulemakings to address a number of regulatory matters relating to wireless commerce. Specifically, the Commission will issue further rulemakings on: whether there are subclasses of CMRS providers, such as small SMRs and paging, where further regulatory forbearance is appropriate; whether to impose reporting requirements on cellular and other CMRS providers to permit the FCC to fully comply with the statutory obligation to monitor the competitive performance of the CMRS market; clarification of whether LEC to CMRS provider interconnection tariffs should be filed, and the obligations of CMRS providers to interconnect with other CMRS providers. The Commission indicated it would impose a very short comment period on these rulemakings so that it can meet its obligations under the Budget Act to finalize the PCS rulemaking by August, 1994, coincident with Commission timelines for launching broad band spectrum auctions, for which the Administration has budgeted 1995 revenues of \$4.2 billion.*

*The FCC's recent rulemaking to implement last year's legislation signals the beginning of implementation of the comprehensive policy for wireless services. CTIA believes there is no need to address wireless issues again with this year's pending bills. To the contrary, enactment of a new policy that requires a new round of rulemakings would impose unnecessary uncertainty on the wireless industry that would delay the introduction of new services and possibly diminish the revenues from the competitive bidding process also adopted last year.*

### **STATE PREEMPTION**

*Sec. 332(c)(3)(A) was added to the Communications Act in 1993. It affects states that do not currently regulate commercial mobile services. By CTIA's estimate, there are 29 states that do not impose rate or entry regulations on commercial mobile services. For these states, the state preemption of rate and entry regulation is effective August 10, 1994. This provision does not, however, prohibit the states from regulating other terms and conditions of commercial mobile services, e.g., cellular site (tower) location, interconnection, and fraud.*

Beginning August 1994, states may, pursuant to §332(c)(3)(B), petition the FCC to regulate commercial mobile services and the FCC may grant that petition if a state demonstrates that: (1) market conditions for services fail to protect subscribers adequately from rates that are discriminatory and unjust and unreasonable; or (2) the foregoing market conditions exist and the commercial mobile service is a substitute for the local exchange service available in the state.

Within 9 months from the date a petition is filed, the Commission must either grant or deny the petition. If the FCC finds that these conditions exist, the FCC must authorize state authority over the rates and charges to ensure that they are just, reasonable, and nondiscriminatory. However, if the Commission finds that such market conditions do not exist, state preemption is continued.

In addition, the bill reflects the intent that states be allowed to regulate radio services if subscribers in the state have no other alternative means of obtaining basic telecommunications service. If, however, subscribers can choose among various competitors of radio service for basic telephone service, it is not the intent of this provision to allow states to regulate these competitive services simply because they use radio-based transmission.

This provision also permits states to include commercial mobile service providers in a universal service fund that applies to all providers of telecommunications services.

Sec. 332(c)(3)(B) This subsection applies to states that were regulating commercial mobile services as of June 1, 1993.

States that have rate regulations in effect on June 1, 1993 that are applicable to a service that exists on that date, are given 12 months from the date of enactment (i.e., from August 10, 1993-August 10, 1994) to file a petition with the FCC to continue those regulations in effect. This filing period coincides with the one year delayed effective date applicable to state preemption set forth in §2(c)(2). Once states file such a petition their existing regulations are automatically continued in effect until the Commission determines whether or not to grant the petition, and under what limiting terms and conditions, if any. The Commission has 12 months to make such determination, including reconsideration. In its petition, the state must satisfy one of the showings required in §332(c)(3)(A)(i) or (ii).

*After a reasonable period of time has elapsed (which is to be defined by the Commission), any interested party can petition the Commission for an order rescinding the exercise of regulatory authority granted to a state pursuant to a state petition filed under §332 (c)(3)(A) or (B). The FCC must rule on such petition within 9 months from the date of filing.*

*If the Commission grants the state's petition it shall authorize the state to exercise such authority over rates for such period of time, as the Commission deems necessary to ensure just and reasonable rates. As the Statement of Managers indicates, it is the intent of Congress that the Commission shall ensure that continued regulation is consistent with the overall intent of this subsection as implemented by FCC, so that similar services are accorded similar treatment.*

**State:**

It is very likely that state preemption will become law. Given this premise where should the Commission focus energies?

In order for Louisiana to be prepared for a role in the wireless information highway, both presently and in the future, it must recognize three things:

- Competition will be the rule and not the exception in wireless services;
- State lawmakers and regulators must maintain a flexible approach to the manner in which they deal with the various telecommunications service providers, avoiding a "one-size-fits-all" perspective while also avoiding the creation of unlevel playing fields or trying to pick winners and losers;
- Market forces will do far more than government to ensure competitive prices and availability of service, and any universal service obligations must be applied in a competitively neutral context to all telecommunications providers.

**Wireless Committee Recommendations:**

1. **Ensure the state's active participation in the National Information Infrastructure.**

- 2. Manage the transition to a competitive marketplace:**
  - a. Implement policies that foster competition.
  - b. Focus on consumer protection, activities. As an area develops competition regulation should be phased out. Noncompetitive, monopoly services should be subject to continued strict rate regulation.
  
- 3. Assure telecommunications access for all:**
  - a. Define POTS, PODS (plain old digital service), POWS (plain old wireless service) for residence and business customers.
  - b. Establish the feature sets of each service that should be available.
  - c. Identify and recommend legislation to provide necessary economic incentives such as tax credits or subsidies to carriers who act as carrier of last resort.
  - d. Identify the information networks that citizens must access to ensure that life long learning, telemedicine and telecommuting opportunities are available.
  - e. Establish a customer need-based universal service program funded fairly by all users of communications services.
  - f. Review, reconfirm or change the universal service program and criteria for POTS, PODS and POWS at least every two years.
  
- 4. Foster the integration of modern wireless technologies in State Government.**
  - a. Identify wireless services that should be adopted by state agencies to improve productivity, efficiency and the quality of services provided to the citizenry.
  
- 5. Assist in removing barriers to wireless construction.**

- a. Recommend legislation to make state lands and facilities available for tower construction.
  - b. Recommend legislation that establishes "tower" zones in each community to ensure continued construction of necessary towers.
- 6. Foster open network architecture of backbone support networks.**
- a. Non-discriminatory access at reasonable rates for all carriers.
  - b. Ensure a level playing field for competing carriers.
- 7. Focus on economic development activities especially in rural areas.**
- a. There are fifty-five parishes in Louisiana which are designated as rural. Due to low revenue potential these areas will be the last to experience the deployment of new telecommunications infrastructure.
- Incentives should be established to entice carriers to speed their employment schedules.
- 8. Foster partnerships among state and local governments and private industry for the rapid deployment of information and telecommunications infrastructure.**
- a. Establish a Commission Advisory Council whose membership shall include service users and providers. This group can aid the Commission in the implementation of the above recommendations.

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## Mobility Demand

			
<b>Home</b>	<b>Leisure</b>	<b>In Transit</b>	<b>Public</b>
Almost 50% of homes utilize the convenience of cordless phones		Over 10 million individuals utilize cellular phones for public/vehicular mobility	

	<b>Work</b> Mobility within the workplace currently causes 20% of in-building workers to be out of touch for more than 2 hours per day.	
		50% of mobile workers (outside of the workplace) find themselves out of touch for at least 2 hours per day.

## Wireless Technologies Forecast 1993 - 2003

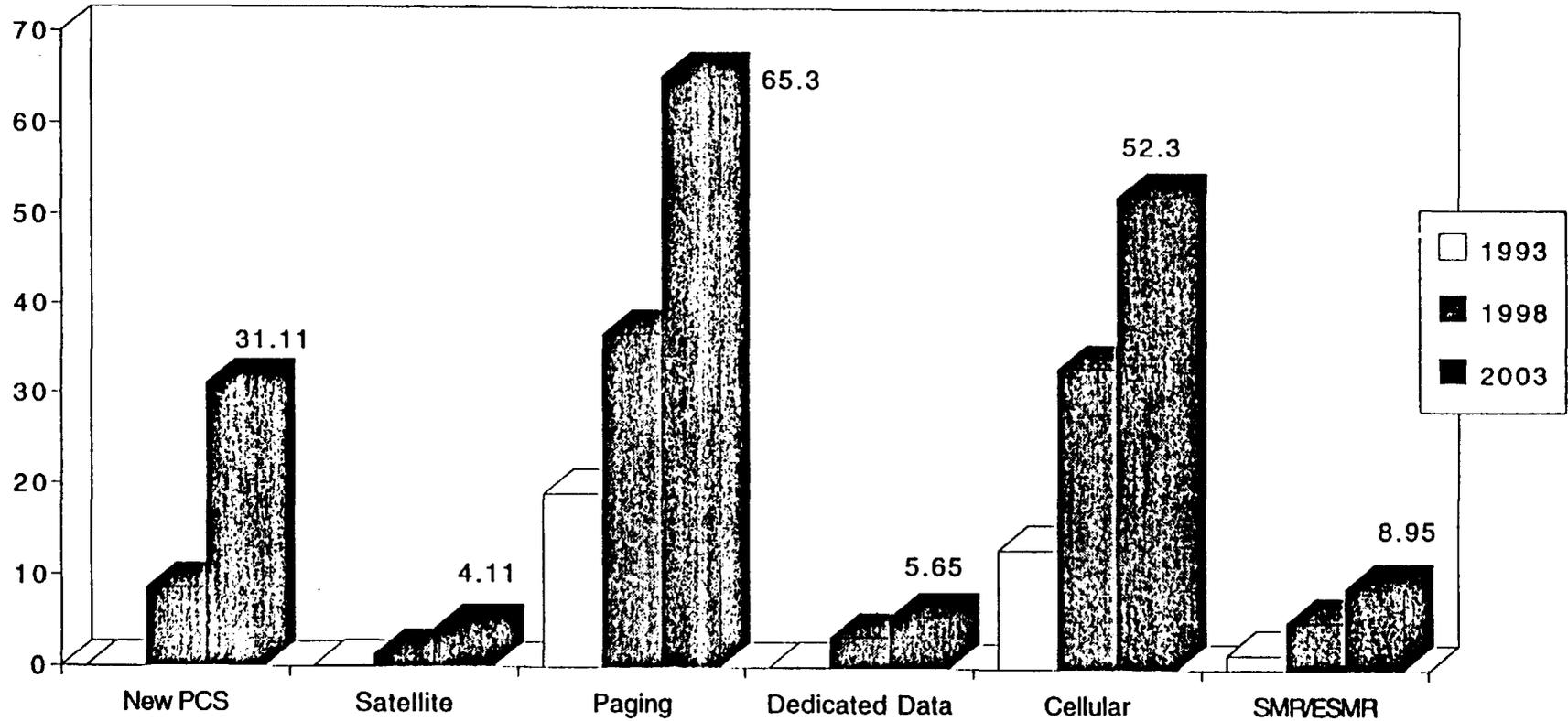
Service	1993		1998			2003		
	Subs. (millions)	Penetration (% of pop)	Subs. (millions)	Penetration (% of pop)	5 Yr. Subs. % Increase	Subs. (millions)	Penetration (% of pop)	5 Yr. Subs. % Increase
New PCS			8.55	3.1%		31.11	10.4%	263.9%
Satellite	0.1	.04%	1.32	0.5%	1224.0%	4.11	1.4%	210.8%
Paging	19	7.4%	36.8	13.3%	93.7%	65.3	21.7%	77.4%
Dedicated Data	0.05	.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%
<b>Total PCS Services</b>	<b>33.7</b>		<b>88.3</b>		<b>162.4%</b>	<b>167.4</b>		<b>89.6%</b>

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).

The Personal Communications Industry Association

**1993 - 2003 TOTAL SUBSCRIPTIONS**  
**SUBSCRIPTIONS (In Millions)**



**EXHIBIT W-2 B**

**TYPICAL WIRELESS SYSTEM  
CAPITAL CONSTRUCTION INVESTMENT**

SERVICE	ELEMENTS	COST
Satellite	Telstar 401 Transponder	\$6,500,000
	Main Downlink	\$1,600,000
	Remote Downlink	\$5,000
Paging (Metro/Rural)	Terminal	\$57,000
	Towers	\$1,440,000
	Equipment	\$811,000
Paging (Metro)	Terminal	\$150,000
	Towers	\$864,000
	Equipment	\$531,000
Cellular (Metro/Rural)	2 Switches	\$6,000,000
	Cell Sites	\$27,000,000
Cellular (Metro)	Switches	\$11,180,000
	Cell Sites	\$65,512,000

## SUMMARY OF EXISTING WIRELESS SERVICE CHARACTERISTICS

CHARACTERISTICS	LANDLINE	PAGING	DISPATCH	S M R	CELLULAR	DATA
Voice Quality (High=Landline)	High	Medium	Medium	Medium	High	N/A
Data (Medium=9.6Kbs)	Medium	Low	Low	Low	Medium	High
Calling	Two-Way	One-Way (with acknowledgment)	Two-Way	Two-Way	Two-Way	Two-Way
Coverage/Mobility	Limited	Ubiquitous	Discrete/ ubiquitous in operating areas	Ubiquitous	Ubiquitous	Discrete/ ubiquitous
3rd Party Service Costs (Low=Landline)	Low	Low	None	Medium	High	Medium High

# SUMMARY OF EMERGING WIRELESS SERVICE CHARACTERISTICS

CHARACTERISTICS	PERSONAL TELEPHONE SERVICE	WIRELESS PBX	MOBILE SATELLITE
Voice Quality (High=Landline)	High	High	Medium - High
Data (Medium=9.6 kbs)	Medium	Medium	Medium
Calling	Two-Way	Two-Way	Two-Way
Coverage/Mobility	Ubiquitous	Limited	Ubiquitous

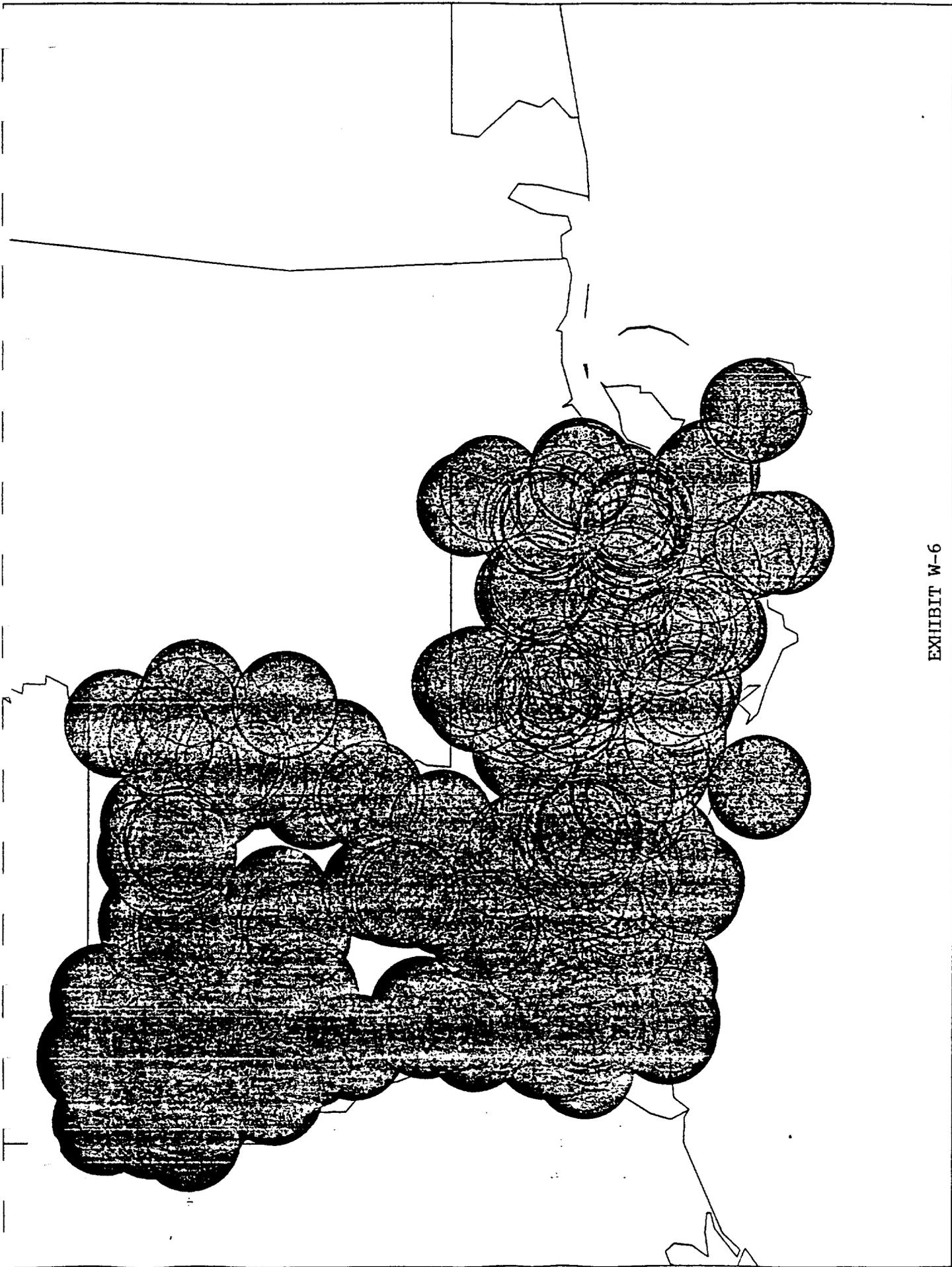
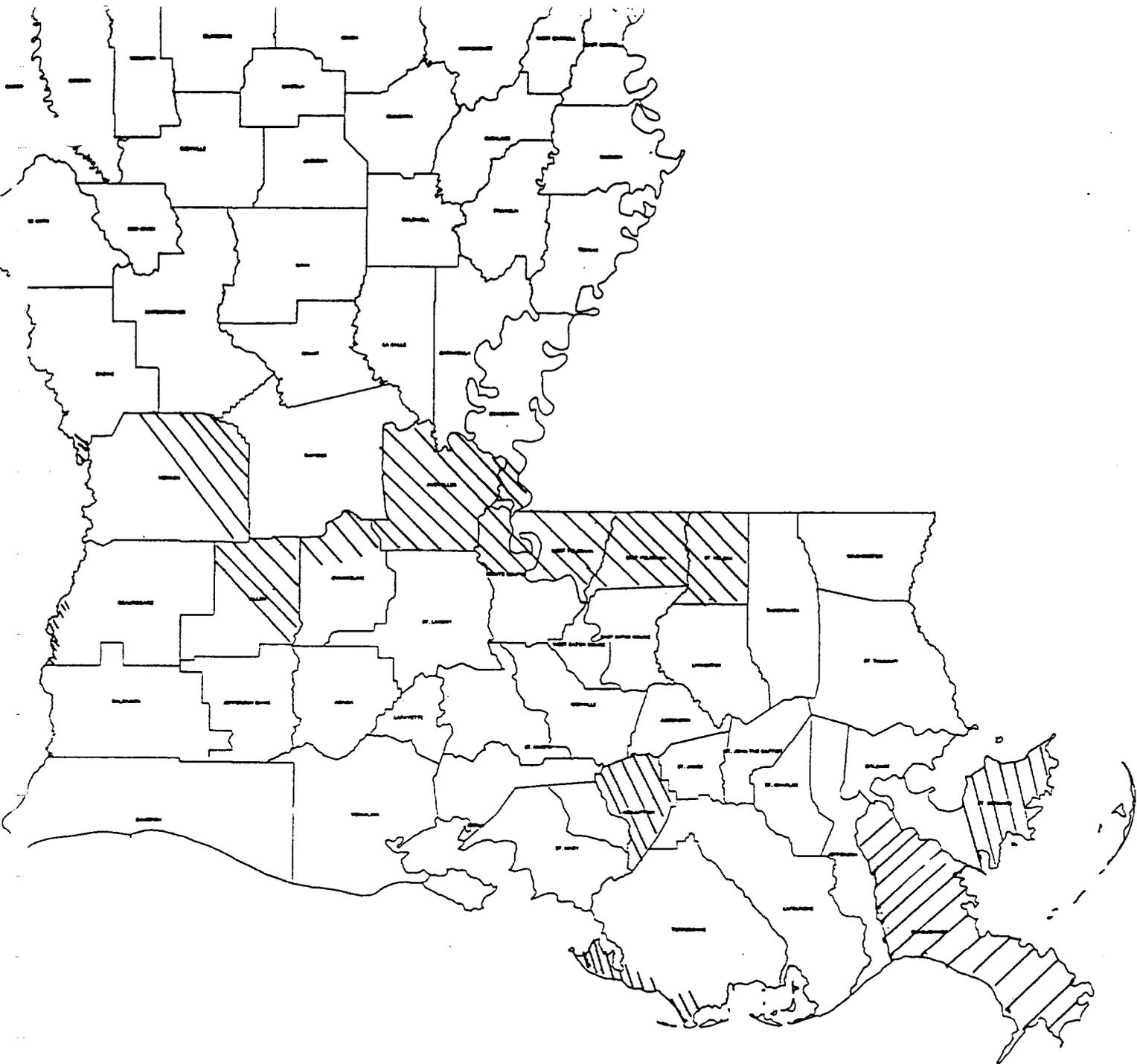
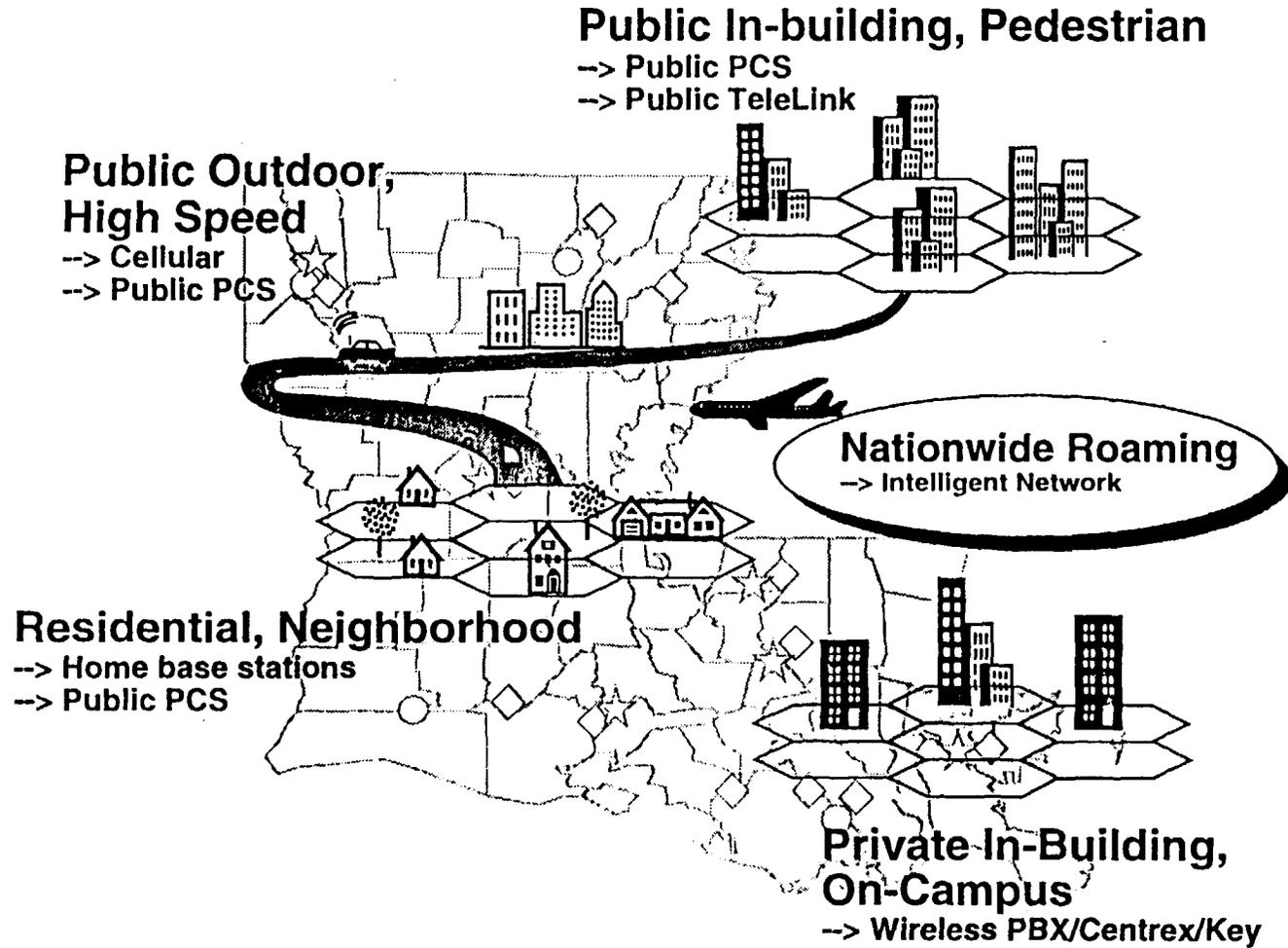


EXHIBIT W-6

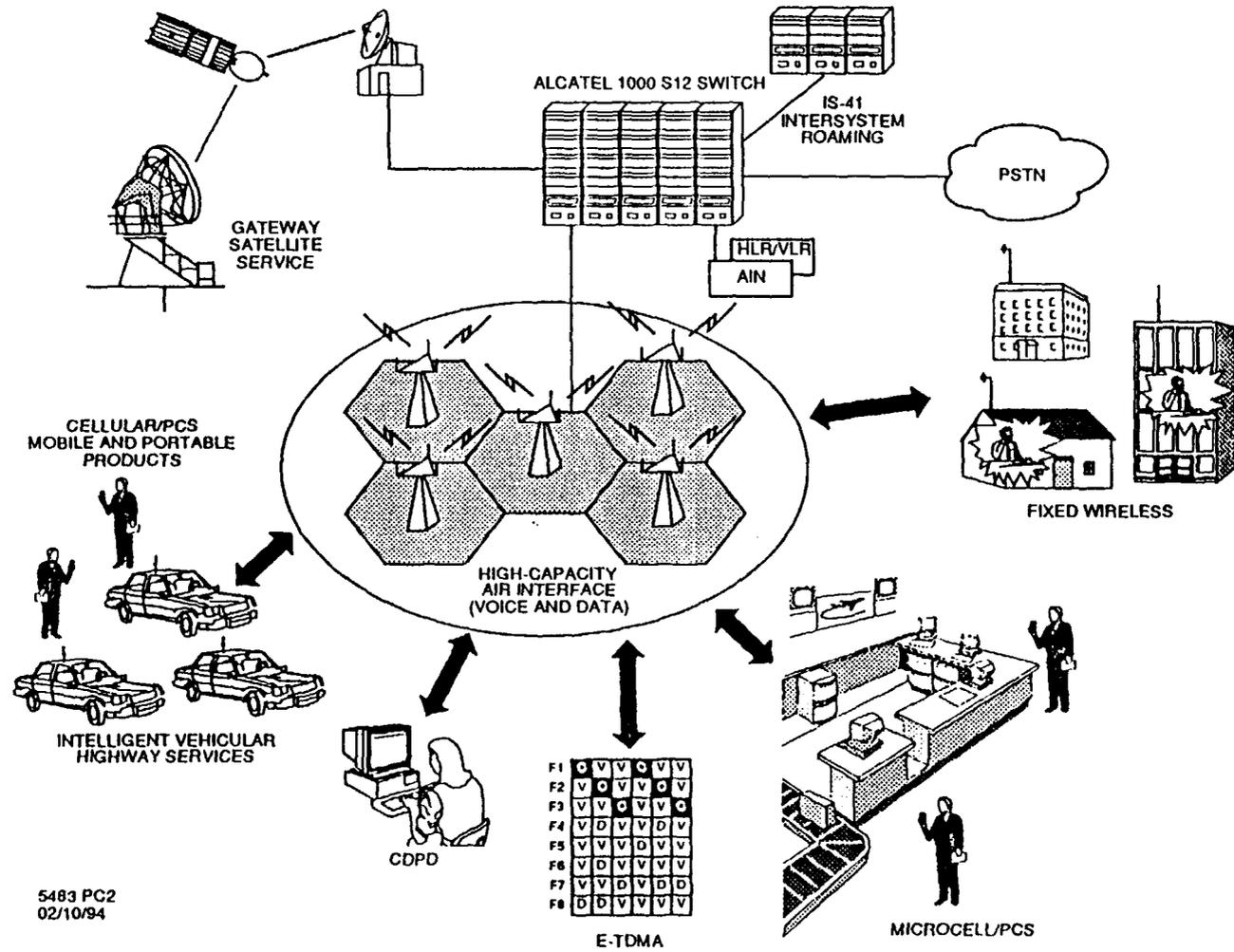


Note: Shading depicts uncovered areas.

WIRELESS SYSTEMS



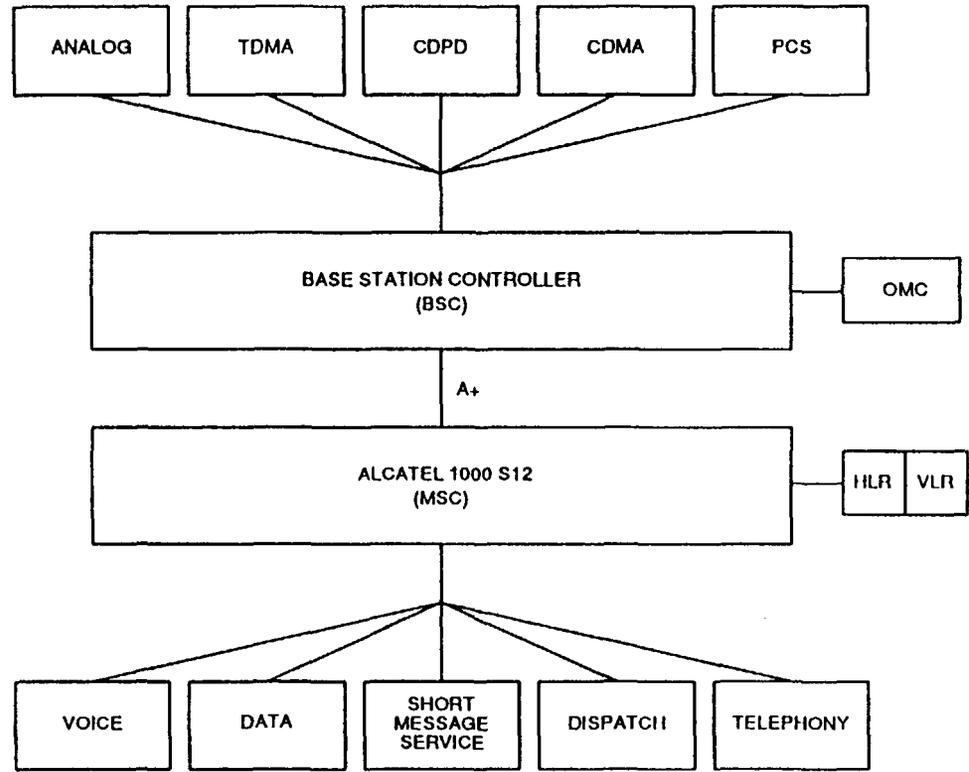
# HNS VISION



5483 PC2  
02/10/94

# THE HNS WIRELESS VISION

## *Flexible Multifunctional Platform*



- **Intelligent radio subsystem**
  - Multiple air interfaces
- **Multifunction switch**
  - HLR/VLR
  - Combined mobile and fixed services

5420 PC2  
03/22/94

EXHIBIT W-10