

VII. THE COMMISSION SHOULD DIVIDE ITS ADVANCED MESSAGING ALLOCATION INTO 25 kHz CHANNELS TO ACCOMMODATE VOICENOW AND POTENTIALLY OTHER INNOVATIVE SERVICES

In considering how to allocate spectrum for Advanced Messaging Services ("AMS"), PageNet believes it critical that the Commission allocate spectrum for Advanced Messaging Services, (AMS), such as VoiceNow™, and award frequencies in a manner that facilitates the flexibility of service providers to offer an array of such services. PageNet further believes that the channel allocations should be consistent with those in the 929 and 931 bands in order to allow for compatible expansion of AMS into traditional paging channels should the market dictate that demand for advanced paging services is more explosive than that for traditional paging services.

PageNet believes that this compatibility and consistency with the adjacent 929 MHz and 931 MHz paging bands is important for several reasons. Initially, certain existing technologies can easily be adapted for use in AMS. A channelization scheme based on 25 kHz spacing would be consistent with existing assignments in the adjacent bands, thus permitting the adaptation of currently available technologies to new AMS systems. For example, Telocator has established a technical committee to establish a North American standard for high speed signalling on 25 kHz channels comparable to ERMES. The technological developments in pagers and infrastructure that follow the new standard can give AMS a headstart in its development and keep costs down to encourage the rapid implementation of systems and service to the public.

It is especially important that consistent channelization be established within the 930 MHz band. The growth of AMS would be severely hampered if manufacturers were expected to produce pagers to multiple specifications. The economies of scale would never be achieved to realize the low cost pager that would benefit the consumer. Also, some manufacturers would choose not to participate in certain segments, given the limited market size. Conversely, if the spectrum is managed so that one type of subscriber device is produced for the entire band, the cost of terminal equipment would be minimized and the participation of multiple manufacturers would be assured.

We believe that VoiceNow™ services, filling an unmet need, will be in great demand in the future. It is very likely that the one MHz allocated for such services will quickly be depleted. At such time, it is likely that an AMS licensee would begin to annex channels in the adjacent bands to increase messaging capacity. These channels might already be licensed to the carrier or they might be acquired. The continued evolution and growth of such systems would lead to more re-farming of the adjacent paging channels until a continuous three MHz paging band would result in response to marketplace demand.

This plan of consistent channelization throughout the three MHz paging band will lead to a flexibility that will encourage system expansion and development in response to marketplace demand. AMS systems will have access to existing channels that might be underutilized in the future. PageNet's own history provides a ready example of how technology upgrades can be

utilized to maximize service to the public and spectral efficiency. As the company expands in a market, PageNet constructs a system on a new channel to utilize the most spectrally efficient signalling format -- 2400 baud today. At the same time, as capacity becomes available on channels constructed in the past, it is able to go back and re-farm that spectrum. Channels that were limited to 50,000 pagers in the mid-1980s are now serving much greater numbers of pagers given today's state-of-the-art technology. We anticipate a similar re-farming with AMS technology.

VIII. THE LICENSING SCHEME FOR ADVANCED MESSAGING SHOULD ENCOURAGE THE COMPETITIVE PROVISION OF THESE SERVICES BUT DETER SPECULATORS

A. The Allocation Should Be Designed to Permit Two National Licensees, and Two Local Licensees

Among the competing factors in determining the appropriate licensing scheme for AMS, the Commission should consider the geographic market for services to be provided, the technical and economic efficiencies that will be gained or lost, and the degree of competition its licensing scheme will engender. Based on these and other factors, PageNet recommends that the Commission grant two national and two local licenses for the 930-931 MHz band, with local licenses geographically determined by Cellular Geographic Service Areas.

It is particularly critical that the Commission grant licenses for the nationwide provision of VoiceNow™ Services.

Based on its own experience in paging generally, PageNet expects the needs of the public to vary over a continuum from local service to wide area and regional coverage to complete nationwide voice paging. Throughout PageNet's history, its customers have demanded greater coverage and greater functionality with each passing year. Other industry experts agree, predicting that "while local service still dominates the market for paging, ...in a year's time up to half the new customers for paging service will be opting for regional, national, or international coverage."^{12/} PageNet expects that the needs of VoiceNow™ subscribers will go through the identical continuum.

Local users demand solid coverage and intense transmitter density in urban areas while regional users insist upon the broadest possible geographical coverage. Nationwide subscribers require coverage in all of the U.S. major cities. A seamless nationwide paging network will serve all three requirements, and users in each category will benefit from the infrastructure installed to serve the others.

Economic efficiencies also dictate licensing nationwide carriers. The ability of carriers to meet the demand for local, regional and national service in the most cost effective manner is dependent on a common infrastructure for which nationwide

^{12/} According to Andy Andros, President and CEO of a nationwide paging company, for the increasingly mobile business community of 120 million professionals, "a local pager" does not make any more sense than a "local only" phone. Exhibit 3, Paging: The Whole Story at 38.

licensing would allow. Paging is most efficiently provided through the networking of various wide area systems.

As importantly, the provision of service to the widest possible variety of users will spread costs over a greater number of pagers and minimize the cost of the service to the end user.

One serious limitation of any regional licensing plan is the problem of where you draw the boundary. The typical requirement for regional coverage will be for a given radius around the user's hometown. Any piecemeal geographic licensing of AMS will create the situation where the regional user "falls off a cliff." Those who have the misfortune of living near the edge of the region will be denied coverage on the other side. It is essential that true seamless coverage be offered nationwide to allow AMS licensees to customize coverage options for their subscribers. Once again, in the interest of minimizing cost to the end user, paging coverage should be tailored to the individual's actual requirement, not on some predetermined notion of a "region."

An example of the public need for this type of seamless coverage can be seen in the cellular industry. While the initial licenses were issued locally, leading carriers must now work around that limitation to create the seamless network demanded by their customers. Likewise, SMR operators, working in an industry where local licensing governs, are adopting acquisition strategies to provide the same seamless coverage that is demanded by users of all wireless communications.

Clearly, the customized regional coverage required both today and in the future by paging users can only be met by some

nationwide licensing of AMS providers. The public interest would also be served by the lower cost service that would result when a common network infrastructure is utilized to provide service to all tiers of the market.

Nonetheless, PageNet also sees a public benefit in purely local licensees. Demand for paging in local markets will continue to be vigorous, and local licensees are positioned to meet that demand. Furthermore, the absence of local licensees would likely delay the introduction of VoiceNow™ Services in smaller metropolitan areas. National licensees will build out systems in large metropolitan areas first in order to satisfy the greater unmet demand that exists there as compared to the demand, in smaller cities. Yet, even in these smaller cities, existing licensees cannot satisfy the predicted demand of VoiceNow™ service and equivalent voice paging services. Local AMS licensees could rapidly fill this void, assuring the rapid and efficient provision of service to the public contemplated by Section 1 of the Communications Act. 47 U.S.C. § 1.

Two nationwide and two local carriers could be licensed under PageNet's proposal. Each licensee would get 250 KHz of spectrum.

B. The Establishment of Construction Obligations, Financial Requirements and Limits on Transferability Will Help Deter Speculators and Assure Rapid Utilization of Frequencies

Given the demand that PageNet sees for voice paging services, it is particularly important that a licensing scheme be devised to assure that licenses go immediately to licensees willing to

construct and operate their systems, both nationwide and local, in a timely fashion. The public will not be served by delays in construction of these stations while licenses trade freely in the marketplace, nor will it be served if the licensees postpone construction because of limited financial resources.

The failure to timely construct would be most egregious in the areas of nationwide licensees, upon which the public will depend for regional as well as nationwide service near term. To assure the rapid build-out of systems by nationwide licensees, PageNet recommends that the Commission establish vigorous financial demonstration requirements for these nationwide applicants. Building on its experience with applications filed for the nationwide and non-nationwide channels in the 220-222 MHz band, the Commission should require applicants for AMS authorizations to demonstrate sufficient financial resources to construct a substantial portion of their proposed systems based on itemized estimates of the cost of such construction. See § 90.713. For nationwide AMS applicants, PageNet believes that proof of the ability to build-out a minimum of 300 transmitter sites in at least 50 cities by the end of one year should be required. No applicant failing this test would be eligible for a nationwide channel. Applicants should then also be required to meet this timetable or face rescission of their license. In its Notice of Proposed Rulemaking, the Commission should also impose additional means of deterring speculation, including: (1)

prohibitions of transferability of unconstructed facilities;^{13/}
(3) partial assignments of licenses; and (3) settlements among
competing applicants. Applicants should also be prohibited from
having any interest in more than one application in an MSA or RSA.

**IX. THE COMMISSION SHOULD ALLOW LICENSEES TO SELECT THE
REGULATORY ENVIRONMENT UNDER WHICH TO OPERATE**

The paging marketplace is currently regulated, depending on
the frequency used, under the Commission's rules governing common
or private carrier services.

In AMS, licensees should be permitted greater flexibility to
choose between private or common carrier regulation. In some
circumstances, it might be desirable for a carrier to offer AMS on
a common carrier basis. In others, private radio services rules
might more appropriately govern, depending on the type of service
the carrier has determined best serves its needs and the public
interest.

The Commission has successfully implemented just such a
flexible regulatory approach to other emerging technologies.^{14/}
For example, current FCC policy provides that Multipoint

^{13/} See Proposed rule sections 22.40(c) and 90.495(k).

¹⁴ The Commission authorized the sale of certain identified
satellite transponders on a non-common carrier basis in
Domestic Fixed - Satellite Transponder Sales, 90 FCC 2d 1238
(1982). The Commission based its decision on an analysis of
the evolving industry and its need for fixed satellite
service ("FSS") flexibility in order to respond to market
forces. The Commission also adopted a flexible regulatory
approach for the Direct Broadcast Satellite ("DBS") Service.
Direct Broadcast Satellites, 90 FCC 2d 676 (1982).

Distribution Service ("MDS") licensees may elect the status under which they will initiate their service offerings.^{15/} Applicants are required to select whether they will provide service on a non-dominant common carrier or non-common carrier basis prior to receiving licenses.^{16/} An MDS provider may elect a different status for each particular channel for which it is licensed and may offer services in some areas as a common carrier, some as a non-common carrier. In addition, MDS licensees may modify their status selection.

In adopting the "elected status" approach, the FCC correctly reasoned that it is often the marketplace that really determines the proposed business relationship between a licensee and its customers. For instance, at its inception, MDS was expected to be predominantly a service for the transmission of data, video conferencing and other business information. It evolved, however, into a subscription video entertainment transmission service and different uses in different markets are continually emerging. The same reasoning applies to the provision of AMS. Flexibility in the industry would (1) provide the best price to

¹⁵ See Multipoint Distribution Service, 2 FCC Rcd 4251 (1987).

¹⁶ As a common carrier, the FCC generally treats an MDS licensee as non-dominant. The Commission forbears from imposing Title II requirements because the complaint process and market forces are sufficient to check a carrier's ability to profitably charge unlawful rates. The Commission's experience with the MDS industry suggests that these carriers do not possess the market power, in a competitive market, to set rates in contravention of Title II. MDS applicants choosing the status of a non-common carrier are subject to the Commission's Part 21 licensing rules (they must file an application for a radio construction permit authorization) and the general provisions of Title III.

the end-user; (2) maximize spectrum utilization; (3) increase innovation; and (4) enhance competition.

To regulate AMS such as VoiceNow™ on the exclusively common carrier or private carrier basis currently applicable to paging providers would result in less innovation, less diversity and fewer options for consumers. In addition it could preclude service entirely in markets, like Atlanta, GA, where additional common carrier competition is foreclosed. Instead, the Commission should adopt a flexible regulatory approach to promote the efficient use of the spectrum and to encourage the maximum economic development of paging technology to meet the changing needs of a competitive marketplace. This approach must permit licensees to choose common or private carriage, and in the case of nationwide licensees, to elect to operate as a private or common carrier on a market by market basis.

Regardless of which mode of operation the carrier chooses, it should not be constrained by limitations in user eligibility. The existing private radio rules currently impose just such a limitation prohibiting the use of private carrier paging frequencies by individuals for personal use. See 47 C.F.R. § 90.75(c)(10). This limitation, if applied to AMS like VoiceNow™ Services, would drastically curtail the ability of carriers to serve existing unmet demand for instantaneous one-way voice services.

As PageNet perceives the market for VoiceNow™ Services, a very substantial portion of the subscribers would use the service for personal use. Attendees of the focus groups conducted for

PageNet by EMCI confirmed that they would like to use the service for personal, as well as business use. See Exhibit 1 at 3.1.3 and 3.2.3. The regulatory scheme adopted by the Commission to facilitate the provision of advanced one-way voice paging services should be flexible enough to accommodate this unmet need, regardless of whether the service is otherwise provided on a private or common carrier basis.

X. THE COMMISSION SHOULD MODIFY ITS RULES TO PROVIDE FOR AMS LICENSING

In proposing an allocation of frequencies, PageNet has given considerable thought to those rules in both Part 22 and Part 90 that would be applicable or would need modification. See Exhibits 4 and 5 attached hereto. In some instances, the rules proposed by PageNet are similar to those currently applicable to the cellular services. They contemplate that the nationwide licenses would be granted based on comparative hearings or, if appropriate, auctions, and that local licenses would be awarded by lottery.

PageNet's proposed rules also explicitly limit services provided in the AMS allocation to one-way service, rather than two-way paging or voice service, to assure the band is preserved for its intended, and urgently needed, purpose. Further, the proposed rules set forth the technical standards under which PageNet proposes those services be operated.

PageNet's proposed rules also establish the application requirements and technical parameters PageNet believes are

appropriate, regardless of whether licensees choose to operate as private carriers under Part 90 or as common carriers under Part 22 of the Commission's rules.

CONCLUSION

In determining how to allocate the limited spectrum reserved for Advanced Paging Services in the 930-931 MHz band, the Commission must carefully consider which proposals are for the provision of spectrally efficient services that are rapidly available at affordable rates to meet widespread demand. PageNet's proposal for its VoiceNow™ services dramatically benefits the public interest through innovative and useful voice paging services attainable at prices businesses and individuals can afford. Furthermore, PageNet has shown that, as in the two-way mobile voice market prior to the introduction of cellular, there is substantial unmet demand for its VoiceNow™ Services, and that they can be provided in a spectrally efficient manner. PageNet therefore respectfully requests that the Commission allocate the 930-931 MHz, in 25 kHz, 10 channel blocks to four licensees providing Advanced Messaging Services so that PageNet

and other innovative providers can begin to serve this unmet need.

Respectfully submitted,

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Dated: June 1, 1992

EXHIBIT 1

**THE MARKET FOR DIGITAL
VOICE PAGERS WITH VOICE
STORAGE CAPABILITIES**

**Prepared by:
Economic and Management Consultants International, Inc.**

EMCI

Telecommunications Consultants

A Malarkey-Taylor Company

The Market for Digital Voice Pagers With Voice Storage Capabilities

Prepared for:

PageNet

by:

Economic and Management Consultants International, Inc. (EMCI)

May, 1992

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1. Executive Summary

Economic and Management Consultants International, Inc. (EMCI) was retained by PageNet to evaluate the market potential for a new generation of voice pager service. This new service represents several important improvements over previous technologies widely available:

- more efficient use of the radio spectrum leading to greater subscriber capacity;
- voice storage capability within the pager; and
- better clarity of voice transmission.

In order to determine the potential market for this product, EMCI evaluated trends within the paging industry, and conducted a series of focus groups. Four focus groups were conducted, two among paging users and two among non-users to determine communication needs, potential acceptance of the product, and likely acceptance at key pricing points. While the results of these focus groups are not statistically projectable, they are indicative of general behavioral trends among the specific segments tested.

EMCI's analysis reveals the following:

- The decline in voice pager use in the U.S. in recent years is due primarily to lack of frequency for traditional voice pagers, not lack of demand.
- The product concept addresses a critical need within the communications marketplace: voice communication messaging that is easy to use.
- Focus groups indicated a high degree of interest and excitement for this new product.
 - Non-paging consumers with awareness of and interest in mobile communications almost unanimously preferred this voice pager service to existing digital display services, even at a higher cost of service. A high degree of subscription interest exists among these potential users.
 - Among existing paging users, those using voice mail in conjunction with their pagers expressed unanimous interest in the product and showed little sensitivity to price within the range tested. Acceptance was more moderate among non-voice mail pager users.

Based on this analysis, EMCI has determined that a broad and immediate market exists for this service:

- A substantial share of future users would select this technology over existing digital display services, perhaps replacing digital display services as the dominant pager type where the new voice service was available.
- Existing paging subscribers using voice mail services would be highly penetrated in a short period of time.
- A significant portion of existing digital display users would convert over time. This segment would be penetrated somewhat more slowly as investment in existing pagers is amortized and service contracts expire.

EMCI has thus concluded that the proposed digital voice pager with voice storage capabilities would better serve a significant portion of the existing base of paging subscribers, and would draw a large number of new subscribers to mobile communications services.

EMCI also concludes that the digital voice pager with voice storage capabilities would:

- increase efficiency,
- improve productivity,
- increase user safety, and
- provide better emergency response capabilities.

Many users and non-users expressed that the ability to receive a voice message instantaneously and that conveys the complete message would save them time and help them do their jobs better or manage their family life better. Users also expressed concern for their own public safety, as well as for the safety of those calling them. Women users said that, in many instances, they will not stop late at night at a payphone to call the caller back, but will instead wait until they are at home. Focus group participants also said that the proposed voice pager would allow them to respond to family emergencies better as they can instantaneously hear the message and the urgency of the caller.

Both users and non-users expressed a primary advantage of the pager, receiving a complete message, not just a phone number. For both personal and business use, not

having to go to a telephone to receive the message, satisfies the demand for complete and immediate message delivery. Knowing whether or not the message is urgent allows the pager user to decide who and when to return calls to.

EMCI is a consulting and market research firm providing services to the mobile communications industry. EMCI publishes publications and performs proprietary consulting regarding paging, cellular, SMR, and microcell technologies. EMCI was founded in 1987 and has staff in Washington, DC, London, and Tokyo.

2. The U.S. Paging Industry Trends and the Market for Voice Pagers

In recent years, digital display pagers (pagers that display a numeric message, usually a telephone number) have come to dominate the paging marketplace. The corresponding decline in voice pager use is not related to demand factors, however. This chapter examines aggregate trends relating to the types of pagers in use in the U.S. These trends indicate a potentially large market for voice pagers.

2.1 Trends by Pager Type

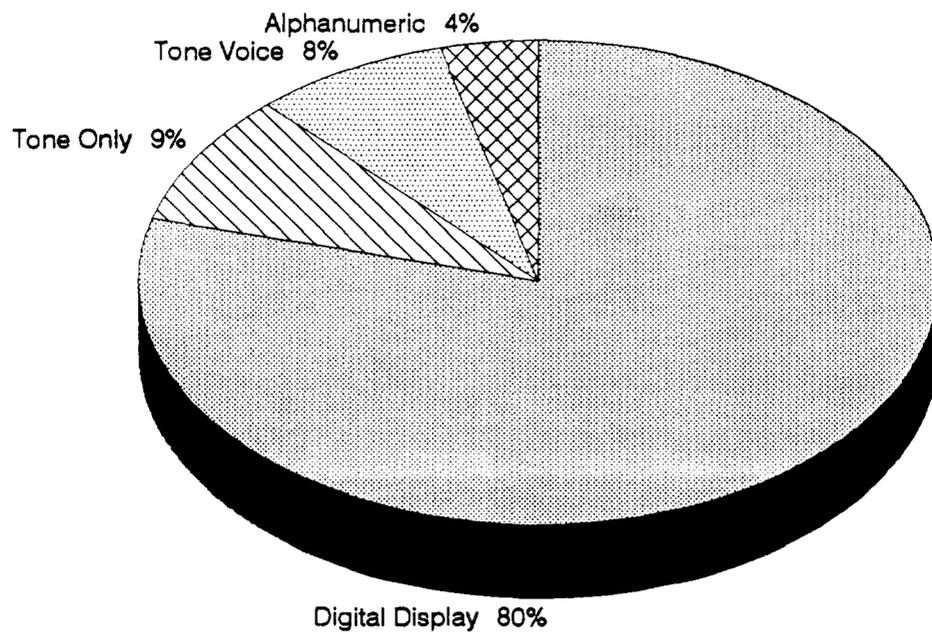
Digital display pagers dominate the U.S. paging market, accounting for approximately 80 percent of all pagers in service by year-end 1991 (see Figure 2.1). Other major pager types are:

- Tone only pagers (beepers): 9 percent;
- Tone voice: 8 percent; and
- Alphanumeric: 4 percent.

The dominance of digital display pagers has been increasing over the past five years (see Figure 2.2). In 1987, digital display pagers accounted for less than half of the subscriber base. Tone only pagers have fallen from 26 percent of the base, and tone voice pagers have fallen from 24 percent of the base. Alphanumeric pagers have increased their share of the base from insignificant levels in 1987 to approximately 4 percent today.

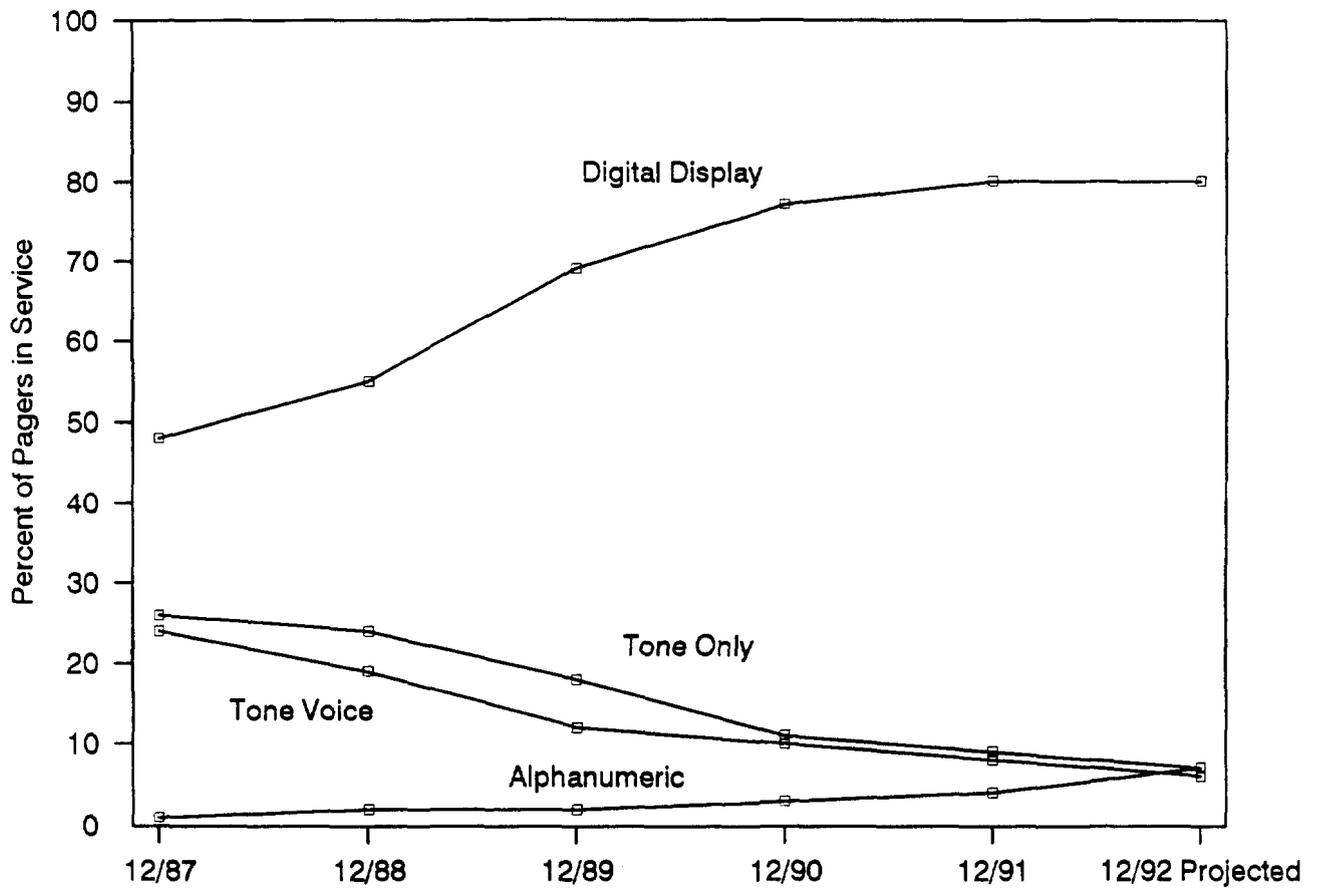
Shifting patterns in pager use are driven by both supply and demand factors. Tone only pagers no longer meet the needs of today's typical paging user, and demand for this type of pager has been falling for a number of years. Digital display pagers provide paging subscribers with a digital message in addition to an alert, and demand has been explosive in recent years.

**Figure 2.1. U.S. Pagers in Service by Type, 1991
(Percent of Pagers in Service)**



Source: EMCI, Inc., based on the EMCI paging survey, January 1992.

**Figure 2.2. U.S. Pagers in Service by Type, 1987-1992
(Percent of Pagers in Service)**



Source: EMCI, Inc., based on EMCI paging surveys, December 1988, June 1989, December 1989, December 1990, and January 1992.

Based on the decline in the share of tone voice pagers, it may erroneously appear that, like tone only pagers, demand for tone and voice pagers is also falling. However, an examination of pager trends by firm size indicates other forces are the primary drivers in the decline of voice pagers.

2.2 Voice Pager Market Share by Firm Size

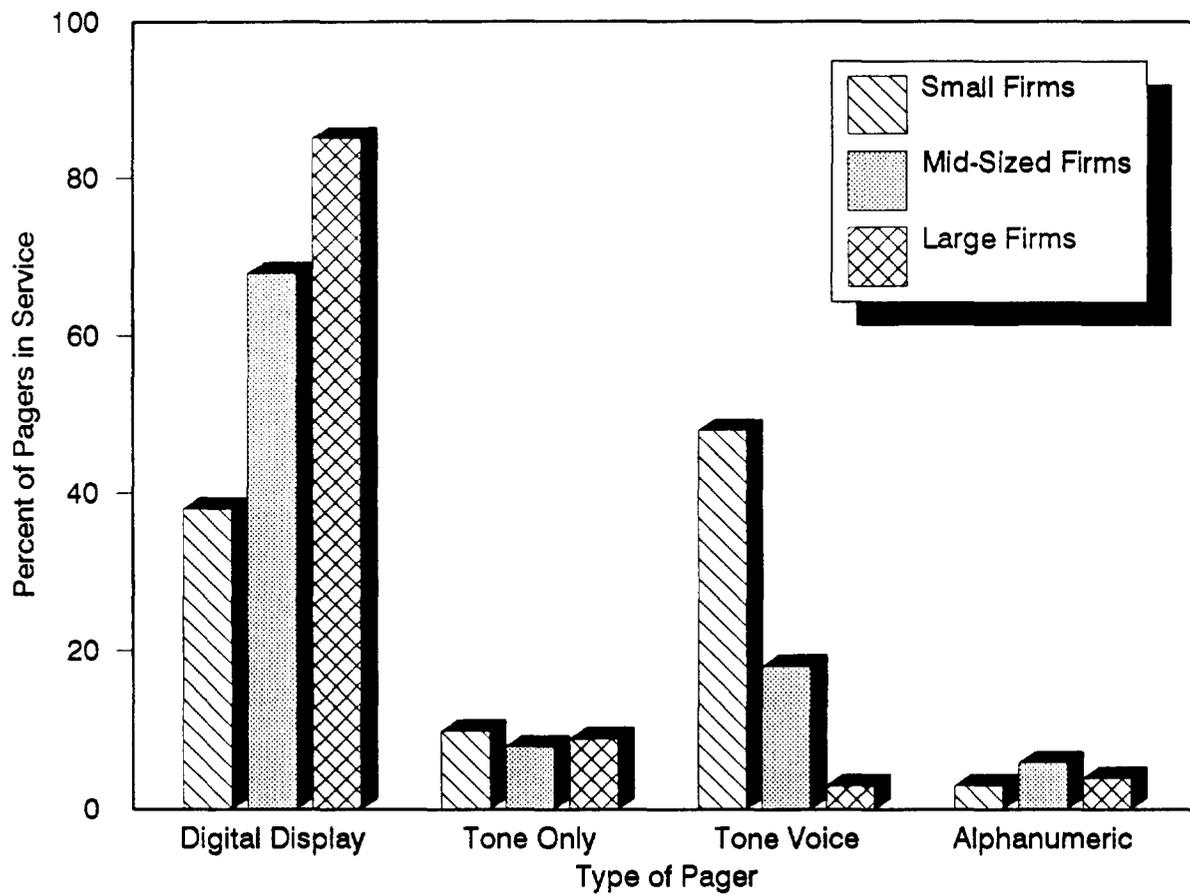
EMCI has found a vast difference in the type of pagers in service across different firm sizes (see Figure 2.3). The largest firms (those with over 10,000 pagers in service) service digital display pagers almost exclusively. Among small firms, voice pagers are the most popular pager type, representing approximately half of their base. EMCI has examined the reasons for these differences.

Large firms are heavily oriented toward the largest metropolitan markets, while small firms are more prevalent in small metropolitan and rural markets. A key factor facing firms in the large markets is frequency congestion, a situation which has been much less of a problem in smaller markets. Traditional voice pagers are much less spectrally efficient than digital display pagers. The channel capacity required by one voice pager can serve a minimum of 40 display pagers. In order to be able to serve the continuously growing subscriber base, paging companies in large, spectrum-scarce markets have gradually phased-out voice pager services.

The impact of supply considerations in voice pager services is evident when examining the decline in voice pager services over time by size of firm (see Figure 2.4). Large firms, which are most likely to operate in spectrum-scare environments, had virtually eliminated voice pager services by 1990. Small firms served the vast majority of their customers on voice pagers in 1987. These firms have followed the lead of the paging industry in promoting digital display services, but because they generally do not face capacity constraints, their share of tone voice pagers has remained at 50 percent and above through 1991.

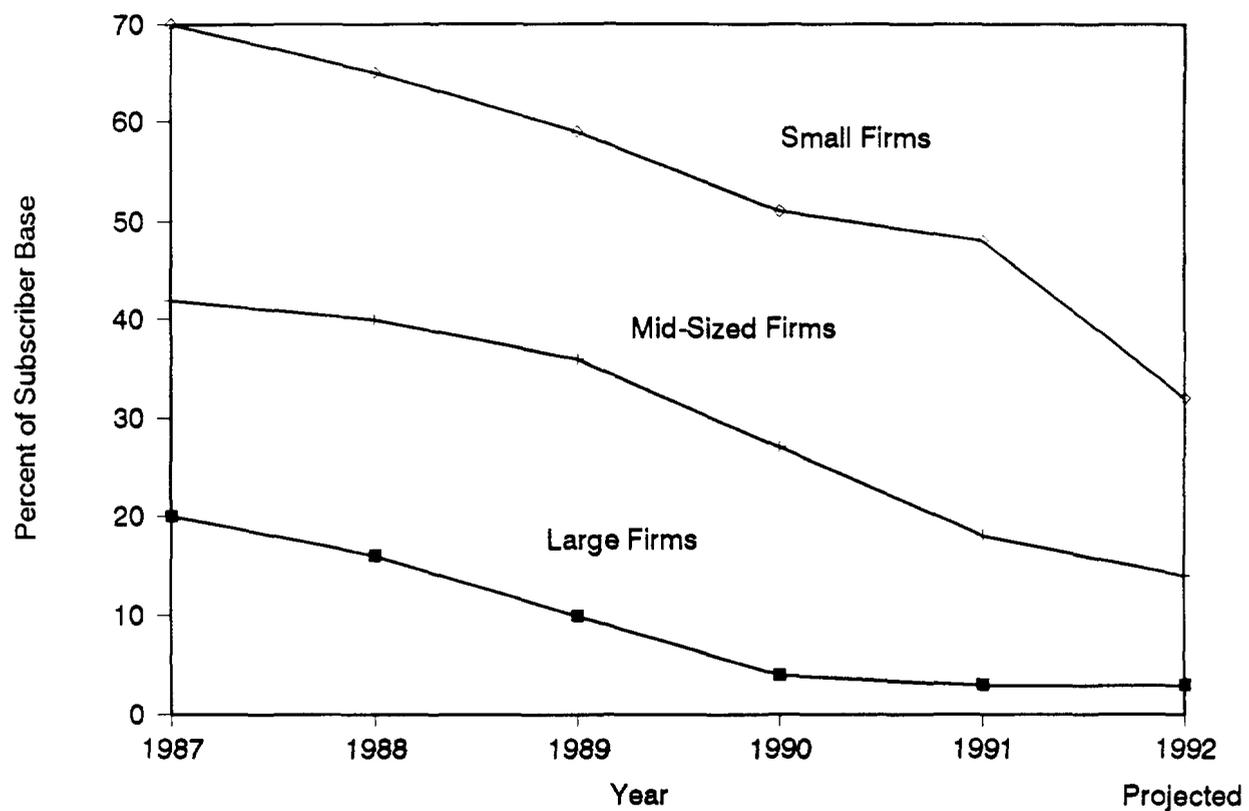
The decline in voice pager use for large firms operating in large markets is thus directly related to the greater efficiency of digital display products. The decline in voice pagers among small firms in smaller markets is due to a wider range of factors including higher infrastructure costs for voice pagers, and the lack of new voice pager products. A number of carriers have indicated to EMCI that voice pager products continue to be popular where offered.

Figure 2.3 U.S. Pagers in Service by Type, By Size of Firm, 1991



Source: EMCI, Inc., based on the paging survey, January 1992.

**Figure 2.4. Tone Voice Pagers Share of Subscriber Base,
by Size of Firm, 1987-1992**



**Source: EMCI, Inc., based on EMCI paging surveys, December 1988, June 1989,
December 1989, December 1990, and January 1992.**