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

**FEDERAL COMMUNICATIONS COMMISSION**  
**OFFICE OF THE SECRETARY**

In the Matter of:

Amendment of the Commission's  
Rules to Establish New Personal  
Communications Services

- )
- ) GEN Docket No. 90-314
- ) ET Docket No. 92-100
- )
- ) RM-7140, RM-7175, RM-7617,
- ) RM-7618, RM-7760, RM-7782,
- ) RM-7860, RM-7977, RM-7978,
- ) RM-7979, RM-7980
- )
- ) PP-35 through PP-40,
- ) PP-79 through PP-85

**REPLY OF MOBILE TELECOMMUNICATION TECHNOLOGIES  
CORPORATION TO 900 MHz NARROWBAND PCS  
RULEMAKING COMMENTS**

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January 8, 1993

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## SUMMARY

The comments in this proceeding overwhelmingly demonstrate that the Commission's proposed allocation of unused 900 MHz bands for new narrowband Personal Communications Services ("PCS") will permit the rapid introduction of a broad and competitive range of needed communications offerings. Mtel's own Nationwide Wireless Network ("NWN"), for example, responds to a significant public demand, estimated by A.D. Little at nearly 10 million subscribers in ten years for two-way messaging and over 7 million subscribers in ten years for acknowledgement messaging. A host of other companies have also proposed a wide array of new services directed toward unmet consumer and business needs. As discussed below, Mtel believes the potential of these new offerings affords the Commission a unique and immediate opportunity to provide the American public with next generation messaging capabilities.

The introduction of these new services is simplified by the wide ranging industry support for the Commission's proposed narrowband PCS framework. As reflected in Mtel's initial comments and the comments of the industry at large, the Commission's proposals for implementation of narrowband PCS systems in the 900 MHz bands establish a sound foundation for the deployment of next generation messaging services. Mtel, and others, have heartily supported the proposed goals of diversity, competition, speed of deployment, and universality, as well as the rules and policies proposed to achieve those goals. In addition, the industry has offered several refinements to the Notice of Proposed Rulemaking's original proposals that will better achieve the Commission's 900 MHz narrowband PCS objectives.

Specifically, a broad base of commenters have supported the following Commission and industry proposals:

- ***Separating the narrowband and broadband PCS rulemakings.*** Because there exist a large number of complex, unresolved issues concerning broadband PCS, the Commission's goals would be furthered by dealing with narrowband PCS issues on a faster separate procedural track.
- ***Creating flexible rules for new narrowband PCS offerings.*** The record demonstrates that consumers will be best served by flexible regulation of new narrowband services that not only promote diversity of services, but also foster competition. Technical rules should ensure non-interference and service providers should be allowed to select their own regulatory status (*i.e.*, common carrier or private carrier).
- ***Allocating spectrum for regional and national licenses for narrowband PCS systems.*** A broad based consensus for allocating spectrum for regional and national licenses has emerged. In such respects, Mtel submits that allocation of spectrum for three nationwide narrowband PCS licenses in the 900 MHz bands would best match spectrum availability to market demand.
- ***Reforming the licensing rules to ensure qualified applicants.*** The need to implement licensing reforms to combat speculation in mobile services licensing figured prominently in virtually all comments in this docket. The Commission must strike an appropriate balance among deterring speculators, ensuring qualified applicants, and retaining entry opportunities for a broad variety of entrants and system designs.

In fact, the only remaining issue for new narrowband services is the question of the appropriate channelization for the 900 MHz bands. Some commenters requesting large allocations have proposed to graft complex schemes into the Commission's proposed rules designed to maximize their opportunity to implement their own particular vision. Allocating large blocks of spectrum, however, disserves the public interest. Excessive spectrum allocations promote inefficiency, foster speculation, and unnecessarily restrict entry opportunities. Furthermore, no record evidence shows efficiencies that could be realized through larger allocations.

As discussed below, Mtel believes the Commission should create a simple bandplan, avoiding complex, burdensome schemes designed to micro-manage spectrum. In particular, Mtel believes the Commission should adopt a channel plan for narrowband services in the 900 MHz bands that uses 50 kHz blocks, for which a need has been demonstrated. In addition, if the Commission finds that engineering considerations warrant an allocation for smaller asymmetrical reverse channels, as some commenters have suggested, all two-way narrowband PCS licensees should be entitled to such spectrum.

By adopting these proposals, the Commission will ensure the rapid availability of the most diverse range of new narrowband PCS offerings. Mtel's refinements offer flexibility while satisfying documented needs, allow for engineering efficiencies within a technology-neutral framework, and provide administrative simplicity without compromising competition or diversity. Mtel believes the Commission should act swiftly to implement these revisions and allow messaging services providers to bring a wide range of needed new communications tools to American businesses and consumers.

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**REPLY OF MOBILE TELECOMMUNICATION TECHNOLOGIES  
CORPORATION TO 900 MHz NARROWBAND PCS  
RULEMAKING COMMENTS**

Mobile Telecommunication Technologies Corporation ("Mtel"), by its attorneys, herewith submits its reply to comments in the above-captioned proceeding to establish new 900 MHz narrowband Personal Communications Services ("PCS").<sup>1</sup> As discussed below, the comments evidence widespread industry support for expeditious Commission action to permit deployment of narrowband PCS, such as Mtel's Nationwide Wireless Network ("NWN"), in the 900 MHz bands. The comments also demonstrate consensus on most important issues, providing the FCC with strong assurances that allocating spectrum for new 900 MHz services will bring immediate dividends to the American public. The only

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<sup>1</sup> *Amendment of the Commission's Rules To Establish New Personal Communications Services*, 7 FCC Rcd 5676 (1992) ["Notice" or "Tentative Decision"]. Pursuant to the Commission's requirements for pioneer's preference filings, Mtel is concurrently filing a separate pleading responding to comments addressing the Commission's tentative decision to award Mtel a pioneer's preference for innovations in the development of the Nationwide Wireless Network system.

contentious issue is the amount of spectrum allocated for each service provider. In such respects, the record shows that allocations greater than 50 kHz would not produce any increased capabilities while unjustifiably curtailing entry opportunities for spectrum efficient service providers. Accordingly, the 900 MHz bands should be channelized into 50 kHz blocks.

**I. MTEL'S INNOVATIVE NWN SYSTEM WILL OFFER SUBSTANTIAL CONSUMER BENEFITS**

Mtel and its corporate predecessors consistently have pioneered significant messaging developments. In the early 1980's, Mtel became actively involved in FCC proceedings to allocate spectrum for a new nationwide paging service. Eventually, Mtel's subsidiary, SkyTel, Inc. ("SkyTel™"), was awarded the first nationwide paging license at 931.9375 MHz,<sup>2</sup> and was the only one of the three original permittees that successfully built and launched a nationwide paging service. Today, SkyTel™ serves over 188,000 subscribers and has experienced a compound annual growth rate of 104 percent since the fourth quarter of 1987.

Mtel's more recent accomplishments include implementing the Nation's first 2,400 bps simulcast messaging technology.<sup>3</sup> This effectively doubled traditional simulcast data

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<sup>2</sup> The license was awarded in 1985 to National Satellite Paging. Since that time, the ownership of the company and the name have changed but the original senior management of the controlling corporation has remained. The name was officially changed to "SkyTel™" in 1989. At present, Mtel owns approximately 91 percent of SkyTel™ and the remainder is owned by Radiofone, Inc.

<sup>3</sup> See *Telocator Bulletin*, Vol. 91 No. 32, p. 2 (August 11, 1991).

rates.<sup>4</sup> Through SkyTel™, nationwide service also has been extended to the growing market for wireless electronic mailbox ("E-mail") services through interconnection of the SkyTel™ network with a number of public E-mail providers. Mtel also now integrates the advanced personal computing of new AT&T Safari™ computers and HP-95LX palmtop computers into the SkyTel™ network.

As a logical continuation of its effort to expand the scope of messaging, Mtel was the first U.S. carrier to implement an international messaging capability. Beginning with the North American border markets, Mtel has succeeded in implementing the world's first and largest network of interconnected messaging systems, called the Mtel Global Messaging Network ("GMN"). Mtel's GMN today consists of six operating countries<sup>5</sup> and an additional nine countries<sup>6</sup> where licenses have been awarded. Mtel International, Mtel's international holding company, typically seeks an equity interest in its foreign ventures, if allowed by local laws.

In keeping with this tradition of innovation, on November 21, 1991, Mtel filed its petition for rulemaking, and a pioneer's preference request, proposing the use of three 50 kHz channels in the 930-931 MHz band for a new Nationwide Wireless Network ("NWN") service. As discussed in Mtel's prior filings, Mtel investigated and proved out a number of

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<sup>4</sup> Rates of 512 bps are also still commonly employed in the simulcast environment.

<sup>5</sup> United States (SkyTel™, 1987), Singapore (Singapore Telecom, 1991), Canada (Cantel, 1991), Mexico (CMtel, 1992), Bermuda (Telecom, 1992), Hong Kong (Sky Telecom Services, 1992). All GMN countries have a common radio frequency and a central computer architecture that uses Mtel's proprietary Universal Messaging System software to guarantee compatibility. This allows the systems to be fully interconnected with each other through a master switching center which is called the Global Network Control Center. Subscribers from any country can extend their service to other participating countries easily, such that their messages will follow them as they travel internationally.

<sup>6</sup> Argentina, Brazil, Peru, Uruguay, Paraguay, Bahamas, Dominican Republic, Malaysia, Indonesia.

innovative technological advances to implement NWN on a spectrum efficient and low cost basis. Specifically, the NWN system combines the following technological breakthroughs to substantially increase the scope of messaging capabilities:

- ***High Speed Simulcasting at Ten Times Current Data Rates.*** NWN provides extensive high speed simulcast messaging at 24,000 bps to facilitate a high capacity nationwide service. This data rate is ten times the speed of the fastest currently implemented systems, also pioneered by Mtel, and twenty times the speed of industry standard 1,200 bps simulcast systems. Developing a data rate of 24,000 bps for a simulcast system required Mtel to employ high dimensionality multicarrier modulation techniques for the first time in a messaging environment.
- ***Advanced Dynamic Frequency Management for Spectrum Efficiency.*** NWN employs an Advanced Dynamic Frequency Management scheme to optimize spectrum efficiency by utilizing a high degree of centralized processing power in the network. ADFM will allow NWN to: (1) utilize a nationwide and zonal format for forward channel (*i.e.*, base transmit) frequency re-use, (2) employ base receivers on an individual basis to permit reverse channel (*i.e.*, portable transmit) frequency re-use, (3) dynamically control access to system resources, (4) minimize inefficiencies caused by contention inherent in portable generated requests to transmit, and (5) tailor location tracking schemes for optimal use of resources.

Individually and in combination, these innovations allow NWN to offer cost-effective and spectrum efficient enhanced messaging capabilities.

Mtel's NWN system establishes an unsurpassed new level of functionality in a messaging system. NWN's features include:

- ***Two-Way Messaging Functionality.*** NWN provides multiple levels of service depending upon the specific requirements of the end user, including automatic "acknowledgement" messaging, user-initiated "acknowledgement" messaging, and two-way transfer capability for short and extended length digital data.
- ***Nationwide Simulcast Coverage.*** As a result of the benefits of simulcast, NWN offers transparent nationwide coverage familiar to today's users of wide area and nationwide paging systems. Simulcasting enhances coverage continuity and building penetration, as well as allowing low cost network growth.

- ***Low Cost, High Efficiency Portables.*** Mtel has estimated that NWN portables, which can be stand alone units or plug-in cards compatible with a wide range of portable and laptop computers as well as personal organizers, will have wholesale prices under \$300. These units will be simple, compact, and, due to the efficiency of the ADFM protocols, will have extended the battery life critical to satisfying the needs of highly mobile customers.
- ***Application Independence.*** NWN offers an application independent digital data transmission service that can be customized for each user's requirements. Virtually any kind of store-and-forward compatible application can be customized for use with NWN by simply creating software for portable computers and the host computer, where appropriate, to take advantage of NWN's open architecture.
- ***Adaptable Functionality.*** NWN supports variable levels of error detection and correction capability, as well as encryption, prioritization, and many billing options depending upon each end user's requirements.
- ***Support for Industry Standards and Customized Needs.*** Interfaces supporting numerous industry standards are planned to allow the broadest compatibility between NWN and wireline messaging systems. Specialized arrangements will also be available to support specific needs for customers.

This remarkable array of features marks NWN as a unique response to the data transmission needs of mobile users. NWN offers unparalleled flexibility in a blend of form and function that is truly next generation messaging.

In recognition of these technological innovations and service enhancements, the Commission tentatively awarded Mtel a Pioneer's Preference in an order released on August 14, 1992. In its *Tentative Decision*, the Commission concluded that Mtel "merits a preference for its having developed and demonstrated significantly improved bit transmission rates, submitted an innovative proposal based upon these improved rates that will result in new service functionalities being available to consumers, and developed the technology

necessary to implement its proposal."<sup>7</sup> The FCC also noted that "Mtel has developed and preliminarily demonstrated what it has named "Multi-Carrier Modulation" (MCM) technology . . . that provides the foundation for Mtel's proposal to provide a wireless network offering a broad range of two-way data communications services, acknowledgment paging, encryption, error correction, and general determination of subscriber location."<sup>8</sup>

Since the Commission's tentative award, Mtel has continued to actively pursue implementation of NWN. Mtel's progress in this regard is extensively detailed in a separate field trial report submitted to the Office of Engineering and Technology's Frequency Liaison Branch today, and included as Attachment A. The report details Mtel's simulcast transmission of messages at a data transmission rate of *24,000 bits per second with a commercially acceptable error rate without forward error correction*. Specifically, Mtel's most recent tests utilized:

- ***4-out-of-8 Permutation Frequency Shift Keying.*** Using a multi-carrier modulation technique known as permutation frequency shift keying ("PFSK"), Mtel was able to achieve sustained, commercially acceptable service at 6 bits per symbol.
- ***Experimental Receiver.*** Mtel's field trials utilized an NWN receiver based on a custom programmed Digital Signal Processor and readily available off-the-shelf materials.

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<sup>7</sup> *Tentative Decision*, 7 FCC Rcd at 5735.

<sup>8</sup> *Id.*

Mtel's tests have thus shown that a sustained NWN transmission rate of 24,000 bits per second (4000 baud x 6 bits/ baud) with commercially acceptable bit error rates can be rapidly deployed upon finalization of Mtel's tentative preference.<sup>9</sup>

Mtel's progress report also describes further demand and market information provided by A.D. Little. A.D. Little conducted a comprehensive series of market research activities to assess the size of the market for NWN and the attractiveness of nationwide and regional messaging services both by individuals purchasing NWN systems for business needs and by corporate MIS bulk purchasers.<sup>10</sup> Recognizing that Mtel's NWN system will support multiple levels of two-way service,<sup>11</sup> A.D. Little's study sized the market for NWN by examining two components, the market for full function two-way messaging and the market for acknowledgement paging.<sup>12</sup> Based on statistically projectable demand research, A.D. Little results show that demand for full two-way NWN capability will be "over 1.3 million users in the first five years, and nearly ten million after ten years of service. . . ."<sup>13</sup> Similarly, A.D. Little predicts demand for NWN acknowledgement messaging capability will

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<sup>9</sup> Efforts are now underway to write manufacturing specifications for the first generation of commercially deployable transceivers known as "personal messaging units" ("PMUs").

<sup>10</sup> See Exhibit A, Attachment 2 ["*ADL Study*"].

<sup>11</sup> As Mtel has previously noted, NWN will support two-way messaging, allowing transmission and receipt of extended data files, user-confirmed acknowledgement messaging, allowing the user manually to acknowledge receipt of a message by transmitting one of a number of "preformatted" messages, and automatic acknowledgement messaging, whereby the party transmitting the message is informed when the NWN portable acknowledges error-free receipt of the message text. These lower functionality services can be provided both using lower cost terminals and lower monthly service charges than full-function NWN. See Comments of Mobile Telecommunications Technologies Corporation at 12, ET Docket 92-100, PP-37 (June 29, 1992) ["*Mtel June 29 Comments*"].

<sup>12</sup> Importantly, while some of the acknowledgement paging market will overlap with the market for full NWN functionality, a great deal of the demand will be cumulative.

<sup>13</sup> *ADL Study* at 9.

exceed 1.3 million users in five years, and approximately 7.7 million users in ten years.<sup>14</sup>

A.D. Little's results also show a substantial preference for nationwide service, with 56 percent of individual purchasers, and 85 percent of corporate bulk purchasers, displaying a significant preference for nationwide service.

As a final matter, Mtel's progress report also discusses future plans, including a recent press announcement detailing an agreement between Mtel and Motorola whereby Motorola will supply Mtel with equipment for Mtel's planned demonstration of an NWN system in Dallas/Fort Worth, Texas. Under the terms of the agreement, Motorola will provide customized RF devices for the demonstration system, including a functional version of the portable two-way unit based on Mtel's specifications, and assist with the construction of other infrastructure components.

## **II. THE COMMISSION SHOULD EXPEDITIOUSLY ACT TO BRING THE SIGNIFICANT BENEFITS OF NARROWBAND PCS TO THE PUBLIC**

On January 23, 1991, Telocator filed a Petition for Rulemaking requesting the allocation of the advanced technology paging reserve band for Advanced Messaging Services.<sup>15</sup> Subsequently, the Commission received a wide variety of proposals for new 900 MHz offerings. At least fourteen companies have submitted plans for expanding consumer choices and capabilities through technological improvements in conventional paging or new, next generation messaging services. Collectively, these filings document an immense

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<sup>14</sup> *ADL Study* at 17.

<sup>15</sup> See Petitions for Rulemaking Filed, *Public Notice*, Report No. 1836 (February 7, 1991); *Telocator Petition for Rulemaking to Amend Part 22 of the Commission's Rules Concerning the Use of 930-931 MHz for an Advanced Messaging Service*, RM-7617 (filed January 23, 1991) ["*AMS Petition*"].

consumer and business demand for next generation messaging services and evidence an industry commitment to bring the benefits of advanced messaging to market rapidly.

The Mtel and other proposals show that, from a regulatory perspective, remarkable advances in messaging can be brought to the public through prompt regulatory actions. Unlike many other proposals requiring relocation of existing users and reallocation of spectrum, the 900 MHz bands are unused and all that is required to launch narrowband PCS is the adoption of service rules. Mtel consequently urges the Commission to act quickly and capitalize on this unique opportunity to bring needed new communications tools to the public without delay.

### **III. THE COMMENTS IN THIS PROCEEDING DEMONSTRATE OVERALL CONSENSUS ON MOST MAJOR ISSUES**

The process of implementing service rules for new narrowband PCS offerings in the 900 MHz bands is considerably simplified by the broad industry consensus displayed in the comments. Commenters have virtually uniformly agreed that the narrowband and broadband PCS proceedings should be separately pursued; that flexible regulation of 900 MHz services would best serve the public interest; that national and regional narrowband PCS licenses, rather than local licenses, best match consumer messaging needs; and that lottery reforms should be implemented to discourage speculators and encourage qualified applicants. The adoption of rules based upon these basic consensus principles would facilitate the rapid introduction of next generation messaging services.

**A. The FCC Should Procedurally Separate the Narrowband and Broadband PCS Rulemakings**

Many commenters, including Mtel, have offered persuasive arguments that the Commission should sever the narrowband PCS proceeding from the broadband PCS proceeding to ensure that the advent of new narrowband PCS is not unnecessarily delayed.<sup>16</sup> First, commenters have noted that the 900 MHz bands are currently unoccupied and are allocated for land mobile operations, so that none of the relocation controversies prevalent in the 2 GHz band proceeding arise in the narrowband PCS rulemaking.<sup>17</sup> Second, in contrast to broadband PCS, where spectrum may support only a handful of competitors, numerous entry opportunities exist for 900 MHz narrowband service providers so that questions regarding appropriate licensing areas, allocation sizes, and entry restrictions can be more easily resolved.<sup>18</sup> Third, as shown in the opening comments, the industry appears to be largely in accord on the vast majority of narrowband PCS issues, unlike in the broadband PCS rulemaking.<sup>19</sup> Fourth, the rules proposed for the two services are extremely different and respond to different technical needs.<sup>20</sup> Accordingly, Mtel believes that the issues before

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<sup>16</sup> See, e.g., Mtel at 2-5; American at 2; Dial Page at 4-5; Florida at 6; Metrocall at 6-7; NABER at 6-7; SWB at 3-4; Telocator at 4.

<sup>17</sup> See, e.g., Comments of Mobile Telecommunication Technologies Corporation ("Mtel") at 3-4; Comments of American Paging, Inc. ("American") at 2; Comments of Dial Page, Inc. ("Dial Page") at 5; Comments of Metrocall of Delaware, Inc. ("Metrocall") at 6; Comments of the National Association of Business and Education Radio, Inc. ("NABER") at 6; Comments of Southwestern Bell Corporation ("SWB") at 4; Comments of Telocator ("Telocator") at 5.

<sup>18</sup> See, e.g., Mtel at 3; American at 2; Dial Page at 4; Metrocall at 6-7; SWB at 4; Telocator at 5.

<sup>19</sup> See, e.g., Mtel at 3-4; Dial Page at 4; Metrocall at 6-7; Telocator at 5.

<sup>20</sup> See, e.g., Metrocall at 7.

the Commission regarding implementation of narrowband PCS systems should be capable of resolution much more quickly than the companion broadband issues, and these proceedings should be resolved separately.

**B. The Comments Show that Flexible Regulations Have Substantial Public Benefits**

The record has also overwhelmingly shown that flexible regulations for new narrowband PCS providers will best serve the public interest.<sup>21</sup> As PageNet has noted, "[f]lexibility in the industry would (1) provide the best value to the end-user; (2) maximize spectrum utilization; (3) increase innovation; and (4) enhance competition."<sup>22</sup> In order to maximize flexibility for new providers, the record suggests permitting carriers to elect their regulatory status upon authorization, thus fostering the most competitive narrowband services.<sup>23</sup> In addition, commenters have shown that minimal technical rules, ensuring only that systems do not mutually interfere, will best promote diversity of services.<sup>24</sup> Consequently, a regulatory framework based on these principles "will better promote consumer welfare than narrowly focussed technical and service regulations."<sup>25</sup>

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<sup>21</sup> See, e.g., Mtel at 5-8; Metrocall at 8-10; Telocator at 7-10.

<sup>22</sup> Comments of Paging Network, Inc. ("PageNet") at 25-26.

<sup>23</sup> See, e.g., Mtel at 5-8; Metrocall at 19-21; NABER at 5; PageNet at 24-27; Telocator at 16.

<sup>24</sup> Mtel at 5-8; Comments of Freeman Engineering Associates, Inc. ("Freeman") at 11; Comments of Motorola, Inc. ("Motorola") at 22; Telocator at 17-18.

<sup>25</sup> Telocator at 7.

As Metrocall has noted, "[u]niform regulations to provide a competitive environment and a flexible regulatory [ ]structure are imperative to realizing the benefits of PCS."<sup>26</sup> Mtel, with the support of a number of commenters, has consistently maintained that the best means of achieving this goal would be to permit new service providers to elect a regulatory status upon authorization. Due to the variety of new narrowband offerings, mandating either common carriage or private carriage status at this time would unnecessarily constrain the diversity of potential offerings. And, as PageNet recognizes, a status election scheme has been successfully used for a number of other communications offerings, including the Multichannel Multipoint Distribution Service, domestic satellite transponder sales, and Digital Electronic Messaging Services.

Mtel also believes that the public interest would be best served if the Commission adopted minimal technical regulations "consistent with a number of recent Commission actions which favor flexibility, as opposed to rigid definitions or restrictions on the kinds of services carriers are permitted to offer, in order to allow advanced technologies and services to develop robustly."<sup>27</sup> Motorola, in fact, "recommends maximum flexibility in technological choices for implementing Narrowband PCS, consistent with band plan, and basic technical parameters such as power and emissions mask specifications."<sup>28</sup> Such regulations would be limited to:

- ***Height and power limits based on the 900 MHz paging service.*** At a minimum, the Commission should allow licensees to utilize the same power

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<sup>26</sup> Metrocall at 22.

<sup>27</sup> Telocator at 7.

<sup>28</sup> Motorola at 22. *See also*, Mtel at 7; Freeman at 11; Metrocall at 10.

and height limits as are used in the 900 MHz paging services. In particular, nationwide licensees should be permitted to utilize up to 3500 Watts ERP at any height, consistent with FAA regulations.<sup>29</sup>

- ***The broadest emissions mask reasonably assuring non-interference.*** Mtel continues to support an emissions mask based on the Commission's rules for existing 900 MHz paging services, modified to reflect the greater authorized bandwidths to be used in narrowband PCS applications.
- ***No restrictions on use of technologically appropriate system designs.*** Mtel favors maximum design flexibility for new licensees. Accordingly, Mtel does not believe the Commission should require the use of adaptive power control for portable units. As discussed in its initial comments, even if adaptive power control is required for regional licensees, it should not be required for nationwide systems.

Mtel believes these suggested revisions will serve the public interest by maximizing flexibility, and thus promoting competition and diversity of narrowband PCS offerings.

### **C. There Is a Clear, Substantiated Need for Nationwide Narrowband PCS License Allocations**

The opening commenters almost unanimously share Mtel's conviction that nationwide narrowband PCS systems should be authorized. While some parties advocate Commission distribution of spectrum for narrowband PCS on a nationwide basis only,<sup>30</sup> and others support the grant of national and regional licenses,<sup>31</sup> most commenters agree as a baseline matter that at least some national systems are needed. As discussed below, these comments provide a sound record basis for allocating three nationwide spectrum blocks.

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<sup>29</sup> Mtel at 7; Comments of Arch Communications, Inc. ("Arch") at 14; PacTel at 27.

<sup>30</sup> Comments of In-Flight Phone Corporation ("In-Flight") at 8 (for its proposed live information and entertainment service); Comments of Pagemart, Inc. ("Pagemart") at 10.

<sup>31</sup> American at 5; Comments of Ericsson Corporation ("Ericsson") at 26; Freeman at 8-9; Motorola at 20; PageNet at 9-12; Telocator at 10-14.

*The record demonstrates that significant demand exists for nationwide narrowband PCS offerings.* Throughout this proceeding, commenters have documented significant demand for narrowband PCS offerings provided on a nationwide basis. Telocator, for example, in its original *AMS Petition*, argued strongly that messaging spectrum was required to support national paging demand.<sup>32</sup> In addition, Mtel, PageNet, and Dial Page each previously submitted demand assessments from reputable independent economic consultants demonstrating significant demand for nationwide offerings.<sup>33</sup>

This extensive showing is further supported by a more comprehensive series of market research activities conducted for Mtel by A.D. Little. The final results of A.D. Little's most recent study confirm that the majority of those seeking NWN service display a significant preference for nationwide coverage. Among prospective individual business buyers of NWN, 56 percent rated nationwide coverage highly suitable, as opposed to 27 percent content with local service only.<sup>34</sup> For potential corporate bulk purchasers, this preference was even stronger, with 85 percent preferring nationwide coverage and only 1.8 percent satisfied with local service.<sup>35</sup> Accordingly, it is clear that likely NWN subscribers require nationwide service to fully address their messaging needs.

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<sup>32</sup> *AMS Petition* at 14-15.

<sup>33</sup> *Mtel June 29 Comments* at Exhibit 2; Mtel at Appendix A. See also *Petition for Rulemaking of Paging Network, Inc.* at Exhibit I, ET Docket 92-100 (June 1, 1992); *Dial Page, L.P. Supplement to Petition for Rulemaking* at Attachment 1, ET Docket No. 92-100, RM-7977 (June 1, 1992).

<sup>34</sup> *ADL Study* at 13.

<sup>35</sup> *Id.*

Notwithstanding this great showing of demand, PacTel has argued against nationwide allocations. Even while recognizing that "Large Geographic Regions Are Required To Satisfy Market Demands,"<sup>36</sup> PacTel suggests regional licensing only. In a separate proceeding proposing national exclusivity for certain 900 MHz private carrier paging companies, however, PacTel has stated:

[I]t is always easier to disaggregate channels from a nationwide use to regional uses, than to aggregate a patchwork of allocations into a nationwide system. The Commission should not be particularly worried that 10 channels may be licensed nationwide because the service provided on those channels may in some instances be turned into regional systems if the licensee is unable to construct a nationwide system.<sup>37</sup>

Just as significantly, PacTel ignores market studies showing demand for nationwide services.

*With three nationwide systems, extensive and varied entry opportunities would exist for a broad range of potential providers.* Arch asserts that "[n]ationwide licenses necessarily reduce the number of licensing opportunities, and potentially reduce competition."<sup>38</sup> However, given the large number of potential allocations, Mtel believes that three national narrowband PCS systems would "ensure a robustly competitive marketplace, while matching allocation of spectrum with reasonable demand and capacity."<sup>39</sup> Unlike in the broadband PCS context, where potential entry opportunities are more limited, the spectrum at issue in the narrowband proceeding could potentially open 60 new 50 kHz

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<sup>36</sup> PacTel at 11.

<sup>37</sup> Reply Comments of PacTel at 5, RM-7986 (June 25, 1992).

<sup>38</sup> Arch at 8. *See also* Comments of PacTel Paging ("PacTel") at 29.

<sup>39</sup> Mtel at 14.

channels. In fact, Mtel submits that given the possibilities within the 900 MHz bands, allocating three national systems advances Arch's stated allocation goal, since it "creates numerous licensing opportunities for a variety of competitors."<sup>40</sup>

In any event, Arch ignores the fact that many narrowband PCS systems proposed for 900 MHz spectrum are inherently designed to serve wide area markets. To function, they require transmitters capable of covering large areas, in marked contrast to the micro-cell technology characteristically employed by 2 GHz broadband PCS services. Thus, irrespective of whether or not national licenses are inappropriate for broadband PCS, the grant of three nationwide narrowband licenses will allow the American consumers and businesses to choose from the broadest range of new offerings and participants.

*As illustrated by Mtel's NWN system, nationwide systems can provide significant efficiencies.* Mtel's NWN system has been designed as a practical response to nationwide messaging needs. As such, the technical parameters of operation have been optimized for nationwide services, and adapting the system to operate as a regional system may not be practically feasible. Certainly, as discussed below, the national nature of the NWN system provides benefits that would be diminished if licensing was on a regional basis only.<sup>41</sup>

NWN is designed to use valuable national time slots that are uniformly simulcasted by all transmitters across the country. These time slots act as an integral part of NWN by allowing the system to identify the approximate location of any particular user terminal, thus enabling Mtel's Advanced Dynamic Frequency Management scheme. In the absence of a

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<sup>40</sup> Arch at 8.

<sup>41</sup> For these reasons, Mtel respectfully disagrees with the assertion that national demand can be satisfied by aggregating regional systems. Arch at 8-9; PacTel at 29.

single nationwide NWN controller and the critical information provided by the nationwide time slots, coordination efforts with adjacent systems to achieve nationwide seamless coverage would require exchanging terminal tracking information, simulcast synchronization data, zoning data, reverse and forward channel time allocation data, and a myriad of other data necessary to offer seamless coverage. This is a virtually insurmountable coordination effort between adjacent systems and would require replicating virtually all aspects of the centralized NWN network intelligence for each regional system.

Such a duplication effort for NWN or other nationwide systems would be economically inefficient and adversely affect the price at which services could be offered to the public. Indeed, parties have noted that "[n]ational . . . licenses are particularly important when one considers the diversity of paging services that will likely be offered over AMS frequencies. For the public to achieve maximum benefit, each service provider must be able to maximize its number of potential subscribers to take advantage of scale and scope economies."<sup>42</sup> Nationwide service areas also would enable manufacturers of network and subscriber equipment to build the necessary infrastructure and terminal equipment in a cost-effective manner thereby directly benefitting the consumer.<sup>43</sup>

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<sup>42</sup> PageNet at 10.

<sup>43</sup> PageMart at 10; PageNet at 10.

**D. The Industry Clearly Favors Adopting Stringent Lottery Reforms To Deter Speculation and Promote Qualified Entry**

The opening comments reflect a broad based consensus that past lottery procedures have fostered abuses.<sup>44</sup> A chief complaint is that prior lotteries have failed to consider public interest factors associated with committed, experienced applicants. As a result, Mtel advocated the use of expedited comparative procedures as the best method of filtering out speculative applicants without delaying service to the public. While Mtel continues to believe that expedited comparative hearings are feasible, the majority of commenters have supported lotteries.<sup>45</sup> Under the circumstances, if lotteries are used, anti-speculation safeguards are essential.

In particular, Mtel supports the following measures proposed by commenters to reduce the level of speculation for 900 MHz licenses:

- ***Qualification Showings.*** All applicants should be required to fully disclose all ownership interests in 900 MHz PCS applicants, including any direct or indirect interests in any other application.<sup>46</sup>
- ***Firm Financial Commitments.*** Firm financial commitments should be required at the initial application stage to assure that applicants have sufficient assets to achieve the actual deployment of the proposed systems.<sup>47</sup>

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<sup>44</sup> See, e.g., Mtel at 10; Arch at 11; Metrocall at 14-15; PageNet at 21.

<sup>45</sup> American at 6-9; Arch at 11-13; Dial Page at 9; Florida at 12-13; Freeman at 10; In-Flight at 3-6; Metrocall at 14-17; NABER at 9; PacTel at 35-51; PageMart at 10-11; PageNet at 20-22 (only if the Commission determines that it lacks auction authority and then only for nationwide licenses); Telocator at 14-15; Comments of the United States Small Business Administration, Chief Counsel for Advocacy at 24-27; Comments of the Utilities Telecommunications Council ("UTC") at 35-37.

<sup>46</sup> American at 7.

<sup>47</sup> See, e.g., American at 7; Dial Page at 9; Metrocall at 15; NABER at 9; Telocator at 14; UTC at 36.

- **Engineering Showings.** Applicants should be required to submit engineering documentation detailing how the service will be offered, outlining technical parameters for base stations such as the reliable service area, the number of receiver sites needed per base transmitter, frequency coordination, and site selection criteria.<sup>48</sup>
- **Filing Fees.** Mtel supports adoption of a tiered fee structure, such as that advocated by PacTel, with two components: (1) a non-refundable filing fee related to the costs of conducting the lottery; and (2) an application processing fee charged on a per-transmitter basis collected from every applicant but ultimately paid only by the lottery winner.<sup>49</sup> The per-transmitter fee should be based upon the theoretical coverage requirements needed to serve all areas, as it presents the greatest deterrent to speculators.<sup>50</sup>
- **Pre-Lottery Settlements.** Applicants should be prohibited from entering into pre-lottery settlements as "no publicly beneficial or legitimate business purpose is served by allowing [such] settlements in narrowband PCS licensing lotteries."<sup>51</sup>
- **Short Filing Windows.** Relatively short filing windows should be employed as a means of reducing the volume of bad faith applications.<sup>52</sup>
- **Construction Benchmarks.** Stringent construction requirements, including specific time limits for completion, should be implemented. In the event that the time limits are not adhered to, construction permits should be forfeited and the spectrum relotteried.<sup>53</sup>

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<sup>48</sup> Mtel at 11; UTC at 36. Other parties have suggested that 900 MHz narrowband PCS applicants be required to specifically identify proposed transmitter sites, and assure site availability in their technical showings. See Arch at 11; PacTel at 36. However, the sheer number of sites involved in the provision of nationwide service renders this task impracticable. Moreover, because nationwide providers are not required to coordinate with other co-channel licensees, extensive site-specific engineering data is not necessary to ensure non-interference. Mtel suggests that for nationwide licensees, minimal notice filings to keep the Commission apprised of construction progress would be sufficient.

<sup>49</sup> Arch at 12-13; PacTel at 39-48.

<sup>50</sup> PacTel at 46-47.

<sup>51</sup> Dial Page at 9; Telocator at 15.

<sup>52</sup> UTC at 36.

<sup>53</sup> See, e.g., Mtel at 11; Freeman at 7 n.8; Metrocall at 16.

By adopting these anti-speculation safeguards, the Commission can identify applicants who will rapidly move to implement proposed narrowband PCS offerings and avoid the regulatory morass that has delayed the introduction of mobile services in recent years.

A number of commenters have also suggested the licensee selection procedures would better serve the public's interest in ensuring qualified applicants if the process incorporated some means of positively rewarding applicants' prior expertise in mobile communications.<sup>54</sup> Mtel believes a significant correlation exists between an applicant's prior experience in developing and implementing mobile radio services and the applicant's ability to expeditiously implement a new service offering. Consequently, Mtel has consistently advocated granting applicants a statistically significant lottery preference for prior experience in mobile services. Mtel continues to believe that the benefits of assuring the highest quality licensees justifies the minimal administrative overhead required to initially assess whether a preference is warranted.

#### **IV. THE FCC SHOULD ADOPT A SIMPLE CHANNELIZATION PLAN FOR NARROWBAND PCS SYSTEMS BASED ON 50 kHz BLOCKS**

To foster development of the widest diversity of architectures and offerings described in the record, Mtel believes the Commission should channelize the 900 MHz bands into 50 kHz blocks. The comments have established a significant demand for 50 kHz channels and shown that 50 kHz channels would allow providers to realize significant engineering

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<sup>54</sup> Freeman at 9-10; In-Flight at 3-6; Metriplex at 12-13.