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FEDERAL COMMUNICATIONS COMMISSION
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In the Matter Of:

Amendment of the Commission's Rules to Establish New Personal Communications Services	)))	ET Docket 92-100 PP-37
To: The Commission	)	

REPLY OF MTEL TO 900 MHz NARROWBAND PCS PIONEER'S PREFERENCE COMMENTS

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January 8, 1993

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Mobile Telecommunication Technologies Corporation ("Mtel"), by its attorneys, herewith submits its reply to comments concerning the tentative Pioneer's Preference awarded for Mtel's Nationwide Wireless Network Service ("NWN") in the above captioned proceeding.[1] As detailed below, Mtel's NWN proposal involves the very type of innovations that the Pioneer's Preference policies were intended to encourage and reward. Moreover, the Commission's award to Mtel is fully consistent with its Pioneer's Preference standards as well as the requirements of the Communications Act and the Administrative Procedure Act. Accordingly, the Commission should promptly convert Mtel's tentative preference into a final grant in recognition of its achievements in developing the innovative NWN service.

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[1] Amendment of the Commission's Rules to Establish New Personal Communications Services, 7 FCC Rcd 5676 (1992) ["Notice" or "Tentative Decision"]. Mtel is concurrently filing a separate pleading responding to rulemaking comments.

I. SUMMARY

In its Pioneer Preference rulemaking, the Commission adopted new policies designed to foster progress in American telecommunications by insuring that true innovators receive spectrum to convert their developments into marketable services to the public. The Pioneer Preference policies sought to overcome past deficiencies in the Commission's radio licensing procedures that left the architects of new services with no greater assurances of ultimately obtaining spectrum than any other applicant. The policies also recognized that U.S. global competitiveness and the fullest possible advances in the nation's telecommunications infrastructure required reforms in the radio licensing process to provide incentives and rewards for pioneers of new technologies and services.

In its 900 MHz Narrowband Personal Communications Service proceeding, the Commission has witnessed an outpouring of new advanced messaging service concepts and approaches stimulated by the Pioneer's Preference policies. Mtel, in its concurrently filed rulemaking reply comments, has outlined a regulatory framework that will maximize the opportunities for the entire industry to exploit fully the 900 MHz spectrum through different technologies addressing diverse aspects of the personal messaging marketplace. The Commission should fashion rules establishing a highly

competitive messaging industry accorded sufficiently broad flexibility to satisfy the full range of consumer needs.

In its Tentative Decision, the Commission invited public comment on its initial determination that Mtel warranted a Pioneer's Preference for its NWN proposal. As documented by Mtel, NWN will offer the public nationwide advanced messaging services at data rates ten times the highest commercially available speed. NWN, through innovative multicarrier modulation techniques and Mtel's Advanced Dynamic Frequency Management scheme, will provide the public an array of new capabilities that includes two-way messaging functionality; nationwide simulcast coverage combined with frequency reuse; low-cost high efficiency portables; application independence; highly adaptable user interfaces; and support for both industry standards and customized needs.

Mtel has aggressively pursued its NWN plans. In the attached Progress Report, Mtel details recent field tests confirming NWN's ability to reliably transmit message data in a simulcast environment to a receiver at a data rate of 24,000 bits per second. Mtel has also announced 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.

In response to the Tentative Decision, just three commenters have expressly addressed the tentative preference

awarded to Mtel.[2] Arch Communications Group, Inc. ("Arch Communications") and Florida Cellular RSA Limited Partnership ("Florida Cellular") insist that the award to Mtel was not justified under the Commission's established standards. BellSouth Corporation, BellSouth Enterprises, Inc., and Mobile Communications Corporation of America (collectively "BellSouth"), on the other hand, argue that "the Pioneer's Preference scheme, as carried out in this proceeding, violates the Administrative Procedure Act and the Communications Act."[3]

As detailed below, these claims are incorrect and ill-founded. The award of a tentative preference to Mtel was fully supported by the record and consistent with the Commission's Pioneer Preference standards. Mtel not only exhaustively documented important innovations associated with NWN, but also demonstrated its technical feasibility. As confirmed by field work and related reports, NWN meets or exceeds Mtel's expectations. Nothing submitted by the

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[2] Several unsuccessful Pioneer Preference applicants have sought reconsideration on the grounds that their proposals were as meritorious as Mtel's NWN service. With respect to such claims, Mtel's views concerning other proposals are already a matter of record that need not be reiterated here.

[3] Narrowband PCS Pioneer's Preference Comments of BellSouth at 2, ET Docket 92-100 (Nov. 9, 1992) ("BellSouth").

commenters detracts from the merits of the Tentative Decision or the innovative nature of Mtel's NWN service.

Finally, BellSouth's attack on the legality of the Pioneer Preference process is wholly without merit. In arguing that evidentiary hearings must apply to the award of Pioneer Preferences, its comments simply refuse to accept the fact that the tentative preference was awarded in a rulemaking context and does not involve a "licensing decision" triggering APA or Section 309 hearing rights. Nor is there any basis for its late blooming claims that the Commission has not given sufficient notice to permit informed comment. As documented below, BellSouth and other interested parties have already had at least three different notice and comment opportunities to discuss any and all aspects of the Mtel proposal, the merits of their own requests, and relevant Pioneer Preference standards. Consequently, the Commission should now award a final Pioneer's Preference to Mtel and adopt rules establishing the NWN service.

II. THE TENTATIVE DECISION PROPERLY RECOGNIZES THAT MTEL HAS PIONEERED AN IMPORTANT AND INNOVATIVE NEW SERVICE TO THE PUBLIC

Mtel and its corporate predecessors consistently have been leaders in 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,[4] 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.[5] This effectively doubled traditional simulcast data rates.[6] 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 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

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[4] 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.

[5] See Telocator Bulletin, Aug. 11, 1991, at 2.

[6] Rates of 512 bps are also still commonly employed in the simulcast environment.

implement an international messaging capability. Beginning with the North American border markets, Mtel has succeeded in establishing 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[7] but licenses have been awarded in an additional nine countries.[8] Mtel International, Mtel's international holding company, typically seeks an equity interest in its foreign ventures, if allowed by local laws.[9]

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 NWN service. As discussed in Mtel's prior filings, Mtel investigated and proved out a number of innovative technological advances, including the use of multicarrier

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[7] United States (SkyTel, 1987), Singapore (Singapore Telecom, 1991), Canada (Cantel, 1991), Mexico (CMtel, 1992), Bermuda (Telecom, 1992), Hong Kong (Sky Telecom Services, 1992).

[8] Argentina, Brazil, Peru, Uruguay, Paraguay, Bahamas, Dominican Republic, Malaysia, Indonesia.

[9] All GMN countries have a common radio frequency and 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.

modulation techniques and Mtel's Advanced Dynamic Frequency Management scheme, to implement NWN on a spectrum efficient and low cost basis.

Mtel's NWN system also establishes an unprecedented new level of functionality in a messaging system, including two way messaging capabilities; nationwide simulcast coverage; low cost, high efficiency portables; an application independent transmission scheme; multiple user interfaces; and support for both industry standards and customized user needs. 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.[10]

Since the Commission's tentative award, Mtel has continued to actively pursue implementation of NWN. Mtel's progress in this regard is extensively documented in a separate field trial report submitted to the Office of Engineering and Technology's Frequency Liaison Branch today, and included as Exhibit 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:

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[10] Tentative Decision, 7 FCC Rcd at 5735.

- ***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.

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.[11] In fact, Mtel currently plans to demonstrate an NWN system in Dallas/Fort Worth, Texas, in the second quarter of 1993.

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.[12] Recognizing that Mtel's NWN system will support multiple levels of two-way

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[11] Efforts are now underway to write manufacturing specifications for the first generation of commercially deployable transceivers known as "personal messaging units" ("PMUs").

[12] See Attachment 2 to Exhibit A ["ADL Study"].

service,[13] A.D. Little's study sized the market for NWN by examining two components, the market for two-way messaging and the market for acknowledgement paging.[14]

Based on statistically projectable demand research, A.D. Little results show that demand for 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. . . .[15] Similarly, A.D. Little predicts demand for NWN acknowledgement messaging capability will exceed 1.3 million users in five years, and approximately 7.7 million users in ten years.[16] 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

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[13] As Mtel 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. Mtel Reply Comments at 12, ET Docket 92-100 (June 29, 1992) ("Mtel Reply Comments").

[14] 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.

[15] ADL Study at 9.

[16] ADL Study at 17.

purchasers, displaying a significant preference for nationwide service.

As a final matter, Mtel's progress report discusses future plans, including a recent agreement whereby Motorola will supply Mtel with equipment for the 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.

III. MTEL'S NWN SERVICE MEETS THE COMMISSION'S ESTABLISHED STANDARDS FOR GRANT OF A PIONEER'S PREFERENCE

A. Eligibility Requirements For A Pioneer's Preference

In its Pioneer Preference Order[17] and Pioneer Preference Reconsideration,[18] the Commission carefully crafted policies and rules designed to foster the development of innovative new radio communications technologies and services. The pioneer's preference policy is intended to ensure that innovators are able to participate in the implementation of

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[17] Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services, 6 FCC Rcd 3488 (1991) ("Pioneer Preference Order"), recon., 7 FCC Rcd 1808 (1992).

[18] Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services, 7 FCC Rcd 1808 (1992) ("Pioneer Preference Reconsideration").

the technology or service "that they took a lead in developing"[19] by ensuring their access to radio spectrum.

To satisfy the initial eligibility criterion for a preference, an applicant must invest significant efforts to develop a new or enhanced service.

> The Commission, in its discretion, will award a Pioneer's preference to an entity that demonstrates that it . . . has developed an innovative proposal that leads to the establishment of a service not currently provided or a substantial enhancement of an existing service . . .[20]

To qualify as an "innovative" proposal, the applicant must demonstrate that it has "brought out the capabilities or possibilities of the technology or service" or alternatively "brought them to a more advanced or more effective state."[21] Among the factors considered by the Commission are added functionalities, changes in operating or technical characteristics, increased spectrum efficiency, a new use of spectrum, increased communications speed or quality, or significantly reduced costs to the public.[22]

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[19] Tentative Decision, 7 FCC Rcd at 5732-33.

[20] Pioneer Preference Order, 6 FCC Rcd at 3494.

[21] Id.

[22] Id.

The Commission has further elaborated on its pioneer's preference policy, listing specific types of new and enhanced services that might warrant a preference:

> [A]n added functionality provided to a broader group of customers than was previously available or a new technology that permits 1) increased ability to perform an existing work requirement; 2) increased capacity in an existing service; 3) a substantial cost reduction in an existing service; [or] 4) improved quality of an existing service.[23]

An applicant for a pioneer's preference must also demonstrate that its proposal is technically feasible, or that it has filed for or received an experimental license to conduct experiments leading toward the implementation of its proposal.[24]

B. The Award of A Tentative Pioneer's Preference For Mtel Is Warranted Because the NWN Service Is A Substantial Enhancement Of Existing Messaging Services

Mtel's NWN service satisfies the Commission's Pioneer Preference Order criteria by substantially enhancing the state-of-the-art in messaging services. NWN significantly advances and improves the capabilities and possibilities of messaging as well as adding numerous functionalities to existing service concepts.

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[23] Id.

[24] Id. at 3493; Pioneer Preference Reconsideration, 7 FCC Rcd at 1809.

As discussed in Mtel's prior filings, Mtel has investigated and proven out a number of 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.*** NWN provides extensive high speed simulcast messaging at 24,000 bps to facilitate a high capacity nationwide service. 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.*** 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 (i.e., base transmitter) channel frequency re-use, (2) employ base receivers on an individual basis to permit reverse (i.e., portable transmitter) channel 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 offers an unsurpassed new level of functionality in a messaging system. NWN's features include:

- ***Two-Way Messaging Functionality.*** NWN supports multiple levels of service depending upon the specific requirements of the end user, including automatic "acknowledgement" messaging, user-interactive "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 the extended 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.

The Commission, in its Tentative Decision, properly recognized Mtel's efforts in developing the NWN service and the associated technology as a pioneering achievement that

> 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.[25]

C. Commenting Parties Fail To Raise Any Concerns That Undermine The Commission's Tentative Decision To Grant Mtel A Pioneer's Preference

Just three commenters, Arch Communications, Florida Cellular, and BellSouth, have taken exception to the tentative grant of a pioneer's preference to Mtel. Their technical objections, totalling a mere ten pages and lacking engineering support, can be categorized as follows: 1) Mtel's NWN service lacks innovation as it is based upon old, existing technology; 2) the technical feasibility of the NWN service has not been proven in the real world environment; 3) NWN will need unnecessarily expensive equipment due to practical requirements for tight global synchronization; 4) RAM Mobile Data's Mobitex is superior to

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[25] Tentative Decision, 7 FCC Rcd at 5735.

NWN service; and 5) grant of a nationwide pioneer's preference to Mtel is unwarranted.[26] As discussed below, their arguments have been previously addressed on the record and either fundamentally mischaracterize Mtel's proposal or misstate the applicable legal standards.

1. NWN Reflects Significant Innovations

Arch Communications, Florida Cellular, and BellSouth have insisted that Mtel's innovations are functionally equivalent to mobile data services available today and thus not sufficiently innovative to warrant grant of a pioneer's preference. Florida Cellular, for example, states that Mtel's M-ary FSK multicarrier modulation technology is not innovative because NEC has "introduced paging technology with transmission rates of 6250 bits per second" and because "FSK is one of the earliest and most dated forms of technology."[27]

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[26] In addition, BellSouth has contested the legality of the Commission's pioneer preference policies, an issue Mtel addresses, infra.

[27] Comments of Florida Cellular RSA Limited Partnership at 17-18, Gen. Docket 90-314 (Nov. 9, 1992) ("Florida Cellular"). Florida Cellular also makes the puzzling argument that Reed Solomon ("RS") and Bose Chaudrey ("BCH") coding achieve higher spectral efficiencies than Mtel's proposed modulation schemes. In so doing, Florida mischaracterizes Mtel's prior submissions, stating "Mtel claims spectral efficiencies of .36 bits per hertz." Florida Cellular at 17-18. In actuality, Mtel's planned transmission scheme will transmit 24,000 bits per second in 50 kHz, which provides a transmission spectrum efficiency of 0.48 bits/second/Hertz. Furthermore, the comparison to RS and BCH

(continued...)

As Mtel has related in prior pleadings, 24,000 bps is an order of magnitude faster than the current implemented state-of-the-art -- SkyTel™'s 2,400 bps data rate, also pioneered by Mtel. While systems, such as ERMES, have been proposed to operate at 6250 bps, these systems are not, to Mtel's knowledge, in commercial use and, in any event, are still roughly one quarter the data rate speed of Mtel's proposal.[28] Furthermore, while binary FSK (or 1-ary FSK) has been a transmission standard for the messaging industry, multicarrier FSK (8-ary FSK) techniques proposed in the Mtel NWN system have not been, to Mtel's knowledge, previously implemented commercially in a simulcast paging environment.

BellSouth, for its part, argues that Mtel's multitone modulation technique is "many years old;" the CPODA protocol is also an existing technology used in "packet satellite service;" and Mtel's use of "adaptive zoning" "is merely a

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[27](...continued)
are completely inappropriate. RS and BCH coding are error control coding schemes that are completely independent of the transmission speed or the modulation scheme. In other words, RS and BCH coding efficiencies are effectively measured in (information bits or protected bits)/(total bits transmitted). This is illustrated by the fact that Mtel tentatively proposed to utilize BCH(31,21) coding with an added parity bit. See Mtel Petition for Rulemaking at A11-A12 n.14, ET Docket 92-100, (Nov. 12, 1991). Furthermore, Mtel has recognized that BCH(31,21) does not have sufficient burst correction capability due to Rayleigh fading, and proposed to utilize bit interleaving for that purpose. Id.

[28] Even in an equivalent 50 kHz channel, the ERMES data rate would be about half that of NWN.

variant on the technique used for registration of cellular units."[29] In its efforts to belittle Mtel's accomplishments, BellSouth has mischaracterized NWN's unique and innovative integration of nationwide simulcasting capabilities with frequency re-use techniques.

First, Mtel is aware that multicarrier modulation techniques have existed in textbook theory for several years. However, Mtel once again points out that such techniques have never before been implemented in an operating simulcast system. Multicarrier modulation techniques are uniquely well suited to simulcast applications yet, to date, Mtel is the only company to invest the considerable experimental effort needed to adapt and prove out these techniques for simulcast operation.

Second, adaptive registration has indeed been used in cellular mobile telephone systems to facilitate follow-me roaming. Mtel, however, has developed and refined the concept of a protocol for adaptive registration, including the ability to change the registration capability of a given portable dynamically, over the air, based on usage patterns in order to improve spectrum efficiency by reducing air-time devoted to registration. Thus, while others have used

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[29] BellSouth at 16-17. It appears that by using the phrase "adaptive zoning", BellSouth was referring to Mtel's proposed "adaptive registration" method for improving spectrum by minimizing the capacity expended on unneeded registrations.

"adaptive registration," Mtel's particular protocols and design are unique.

Third, Mtel has developed a customized version of CPODA for NWN. This would mark the first application of CPODA in a personal messaging service. Among other features, Mtel's CPODA scheme has the reservation carry a description of traffic the portable wishes to transmit so that the central scheduler can optimize the reverse channel assignment and not require packet-by-packet use of the reservation sub-channel.

As a final matter, Arch states that Mtel's "work does not appear to be different in kind from experimentation being conducted by paging equipment manufacturers and others."[30] Arch, however, provides no indication of what specific technical work has been conducted by others or pre-dates Mtel's accomplishments. In point of fact, Mtel is the first to develop the NWN service and its underlying innovations for practical real world service to the public.

2. Mtel has Repeatedly Demonstrated the Technical Feasibility of the NWN Service

BellSouth takes issue with the technical feasibility of Mtel's multitone modulation technique, stating that "the only data provided is a simulation of its technical feasibility

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[30] Comments of Arch Communications Group, Inc. at 15-16, Gen. Docket 90-314 (Nov. 9, 1992) ("Arch Communications").

performed by an outside laboratory" and that Mtel had not filed experimental data validating the simulation at the time of the tentative grant of its preference.[31]

As BellSouth well knows, however, the extensive computer modelling conducted by MPR Teletech, at Mtel's direction, was submitted as part of a comprehensive Technical Feasibility Demonstration.[32] Nowhere, however, does BellSouth demonstrate that computer validation is inadequate to satisfy the Commission's requirement to prove technical feasibility. Nor does BellSouth note any defects in MPR's computer validation. In any event, contrary to BellSouth's assertions, Mtel went far beyond computer modelling and also filed experimental data demonstrating the performance of MCM in a real world environment.[33] In addition, Mtel is now submitting a separate field trial report as Exhibit A which confirms, among other things, that Mtel was able to achieve sustained, commercially acceptable service at 24,000 bits per second using multicarrier modulation techniques.

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[31] BellSouth at 17.

[32] See Mtel Technical Feasibility Demonstration, ET Docket 92-100, PP-37 (June 1, 1992) ("Mtel Feasibility Demonstration").

[33] Mtel Reply Comments, exh. A.

3. NWN Will Operate with Low Cost Customer Equipment

Florida Cellular also argues that Mtel's use of CPODA in the NWN system will require a tight global clock, driving up terminal costs, and that the ALOHA protocol "is more suited to the user Mtel believes is a candidate for its proposal."[34] In reality, Mtel's proposal will require systemwide synchronization for relatively short periods -- not constant global synchronization -- and systemwide synchronization is relatively simple to achieve in a simulcast system. Since the simulcast signals carry the same information, all mobiles "lock" to the simulcast once per cycle, and need only remain synchronized for the duration of a single cycle. As Mtel discussed, this can be achieved using readily available circuits -- MPR Teletech concluded that frequency stability of the local oscillators needed would not need to exceed 2.5 ppm.[35]

Florida Cellular also fails to note that CPODA is designed to improve throughput radically over a pure ALOHA system by: (1) dividing mobile transmission cycles into long scheduled and short unscheduled intervals; (2) using a short "request to transmit" packet to schedule data transmissions;

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[34] Florida Cellular at 18.

[35] See Mtel Feasibility Demonstration, exh. C at 14.