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Before the
FEDERAL COMMUNICATIONS COMMISSION
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FEDERAL COMMUNICATIONS COMMISSION
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In the Matter Of:

Mobile Telecommunication)
Technologies Corporation)
Request for a Pioneer's Preference)
Regarding its Petition for Rulemaking)
to Allocate Three 50 kHz Channels in the)
930-931 MHz Band and to Establish Rules and)
Policies for a New Nationwide Wireless)
Network (NWN) Service)

ET Docket No. 92-100
PP-37

TECHNICAL FEASIBILITY DEMONSTRATION

Jai P. Bhagat
Executive Vice President,
MOBILE TELECOMMUNICATION
TECHNOLOGIES CORP.
and President,
MTEL TECHNOLOGIES CORP.
Security Center -- South Building
200 South Lamar Street
Jackson, Mississippi 39201
(601) 944-1300

Of Counsel:

Richard E. Wiley
R. Michael Senkowski
David E. Hilliard
Eric W. DeSilva
of
WILEY, REIN & FIELDING
1776 K Street, N.W.
Washington, D.C. 20006
(202) 429-7000

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SUMMARY

Paging services have been an enormous success story. Over twelve million Americans benefit from the ability to be reached on the move through these basic, low cost telecommunications services. Mtel, as a technological innovator, pioneered and deployed the country's first nationwide service. As a result, a ubiquitous network exists that can reach anyone, virtually anywhere, at anytime.

Mtel's proposed Nationwide Wireless Network ("NWN") service transcends existing technological limitations to introduce the next generation of advanced messaging services. Today's paging services are strictly one-way and typically limited to 1,200 bps. Tomorrow's NWN service would shatter these constraints:

- ***Speed.*** NWN will support extensive high speed messaging at up to 24,000 bps to facilitate a high capacity nationwide service.
- ***Two-Way Functionality.*** NWN will support multiple levels of reverse channel service depending upon the specific requirements of the end user -- automatic acknowledgement from portables that a message has been received to support "return receipt requested" applications; user-interactive simple preformatted acknowledgements to confirm messages have been received by the end user; and, full two-way transfer capability for short and extended length digital data.
- ***Nationwide Coverage.*** NWN offers transparent nationwide coverage familiar to today's users of wide area and nationwide paging systems. NWN will also support seamless interconnection with AMSC's mobile data services to provide coverage even in the most remote areas.
- ***Application Independence.*** NWN offers an application independent digital data transmission service that can be customized for each user's requirements.
- ***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.

Thus, NWN offers an unprecedented leap forward in messaging capabilities coupled with national two-way functionality!

The implications of NWN are enormous. Mtel's proposal would allow consumers to carry the power of a sophisticated national network on their person. NWN would provide a ubiquitous, immediate infrastructure for "telecomputing" and information services interacting with both inexpensive portable data devices and personal computers. Paging would be transformed into its full 21st Century messaging potential.

The key to future national messaging services lies in a number of technological innovations pioneered by Mtel. NWN introduces the following notable advances that integrate simulcasting and frequency re-use systems to produce enormous gains in data rates, spectrum efficiency, and network functionality:

- ***Enhanced Multitone Modulation.*** NWN relies on high dimensionality multicarrier modulation techniques to go beyond simulcast data barriers and achieve transmission rates up to 24,000 bits per second -- 10 times faster than the fastest existing simulcast systems (2,400 bps), a technology also pioneered by Mtel.
- ***Simulcast Zoning.*** Relying on an intelligent centralized network architecture, NWN utilizes a highly spectrum efficient zoned network that retains the significant benefits of simulcast while allowing extensive frequency re-use and graceful expansion capability.
- ***Multiple Receiver Load Balancing.*** Mtel has developed a protocol that allows its central computers to track the location of portables, simultaneously scheduling reverse channel transmissions on each receiver in the network to permit extensive frequency re-use.

- ***Dynamic Scheduling.*** NWN transmissions are designed to offer the greatest practical degree of flexibility to the system controller to alter the allocation of system resources in real time, efficiently accommodating variations in the balance of forward/reverse, nationwide/zonal, address group, and scheduled/unscheduled reverse channel traffic.
- ***Contention Priority Ordered Demand Assignment of Resources.*** Mtel has developed a flexible, dynamic transmission protocol that optimizes use of the reverse channel by minimizing the effects of unpredictable contending portable transmission requests.
- ***Adaptive Registration.*** Mtel's use of Intelligent Network functionalities permit the NWN system to utilize real time data acquired on customers' usage patterns to maximize efficiency in locating portables by dynamically altering registration schemes "over the air."

Collectively and individually, these innovations result in a service that offers highly spectrum efficient wireless messaging capability, flexibility to accommodate a wide range of consumer needs, and the use of low cost portable units with extended battery life.

In order to demonstrate the technical feasibility of the NWN innovations, Mtel has undertaken a comprehensive program of laboratory research, computer modeling and field testing. MPR Teletech Ltd, a leading telecommunications research and development company, has evaluated and confirmed the theoretical underpinnings of Mtel's proposal in extensive studies appended to this submission. Finally, Mtel's aggressive field test program for verifying NWN's capabilities is underway and progress reports will be submitted to the Commission at each major benchmark.

The extensive efforts reflected in this Technical Feasibility Demonstration document the technical feasibility, technological innovations and public importance of Mtel's NWN service proposal. Accordingly, prompt and favorable action on Mtel's Pioneer Preference Request is respectfully requested.

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