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Federal Communications Commission

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In the Matter of Allocation and Designation of Spectrum for Fixed Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	IB Docket No. 97-95 RM-8811

COMMENTS OF TELEDESIC CORPORATION

Teledesic Corporation[1] hereby responds to the Commission's call for comments on the 36.0-51.4 GHz band plan proposed in the *Notice of Proposed Rulemaking* in this docket.[2] The *NPRM* is an important contribution to the evolving discussion about spectrum management at higher frequencies, and it deserves the careful attention it will surely receive. Teledesic applauds the Commission's affirmation of two broad themes in the *NPRM*. First, Teledesic agrees that the future development of satellite services demands that the Commission and other regulatory authorities identify separate frequency bands for the primary use of satellite systems in geostationary orbit ("GSO") and non-geostationary orbit ("NGSO"), respectively. Second,

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1 Teledesic is licensed to provide Fixed Satellite Service ("FSS") in the Ka band from a constellation of non-geostationary satellites. *Teledesic Corp.*, DA 97-527 (March 14, 1997). The Teledesic Network will provide switched, broadband network connections through service partners in host countries worldwide, from the largest urban centers to the most remote villages.

2 FCC 97-85 (released March 24, 1997) (*"NPRM"*).

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Teledesic agrees that the ubiquitous deployment envisioned for both satellite and terrestrial services in the higher frequencies requires that separate bands be designated for the primary use of each of these services.

Separate Frequency Bands Should Be Identified to Accommodate Both Geostationary and Non-Geostationary Satellite Systems.

One premise of the *NPRM* is that GSO and NGSO satellite systems should each enjoy primary use of designated frequency bands. Based on this premise, the Commission proposes to allocate 2 GHz of spectrum in these bands for NGSO use, and another 2 GHz for GSO use.[3] Teledesic endorses this general approach.

The benefits of NGSO satellite networks are by now well known, and the events of the last five years make it clear that both GSO and NGSO systems will be with us for a long time. The challenge facing the Commission and the industry is to develop regulatory structures that allow each type of system to flourish in the applications to which its architecture naturally lends itself.[4] Given the degree of interference that each type of network causes to the other, the presumption going forward should be that GSO and NGSO satellites should operate in separate frequency bands. By designating different spectrum for these very different types of systems, the

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[3] *NPRM* ¶¶ 21-22.

[4] Because NGSO satellites move in relation to the Earth's surface, continuous coverage of any one point on Earth requires, essentially, continuous coverage of *all* points on Earth. These systems are therefore global by nature, inherently capable of offering the same quality and quantity of service to users in the least developed markets as they offer to users in the most advanced markets. Similarly, the much lower altitudes at which NGSO systems orbit make it possible for such systems to operate at lower power than GSO systems, and to communicate with much less "latency" or delay. By contrast, NGSO systems would typically be poorly suited for the broadcast-type applications typically provided by GSO systems.

Commission can reduce the risk that unwise sharing constraints will result in compromised system designs, which could prevent system operators from fulfilling the promise of their complementary technologies.

Teledesic therefore supports the Commission's proposals to allocate the 37.5-38.5 GHz band for FSS downlinks, to pair that allocation with the FSS uplink allocation at 48.2-49.2 GHz, and to designate these two band segments for NGSO FSS. One company has already applied for authority to construct, launch, and operate an NGSO FSS system in these frequencies, and any system ultimately licensed in these bands deserves the opportunity to compete free of the unreasonable burdens that would be required if GSO systems were permitted to operate in the band.

Similarly, Teledesic supports the Commission's proposals to allocate the 40.5-41.5 GHz band for FSS downlinks, to pair that allocation with the FSS uplink allocation at 49.2-50.2 GHz, and to designate these two band segments for GSO FSS. Although there is currently no proposal for a GSO FSS system in these frequencies, it is reasonable to provide equivalent amounts of spectrum for GSO and NGSO use.

Separate Frequency Bands Should Be Identified to Accommodate Both High-Density Satellite and High-Density Terrestrial Services.

For more than four years, the Commission has been beset by conflicting spectrum demands from satellite and terrestrial operators. At 2 GHz, the Commission wrestled with conflicting demands from proponents of Mobile Satellite Service ("MSS") and terrestrial PCS networks. At 18 and 28 GHz, the Commission wrestled with conflicting demands from MSS and FSS proponents on the one hand and terrestrial Local Multipoint Distribution Service (and later

Digital Electronic Message Service) proponents on the other. At 38 GHz, the same conflict has been replayed as a battle between an NGSO FSS applicant and the incumbent terrestrial fixed services. In each of these cases, the Commission was faced with the prospect of multiple, ubiquitously deployed, and incompatible services. The traditional paradigm of satellite/terrestrial co-frequency operation — by which a relatively small number of large, expensive terrestrial links were coordinated site by site with a relatively small number of large, expensive satellite earth stations — did not fit these newer services and provided no help in resolving the conflict.

The *NPRM* aptly summarizes the fundamental conclusion of all these battles when it notes, "Given the ubiquitous nature of some of the services proposed, it is not likely that satellite and terrestrial systems will be able to share the same spectrum without significant technical constraints on the operations of one or the other, or both, types of systems. . . . Consequently, we believe a band plan, with frequencies designated for different types of high-density services, would provide the various proposed systems with the best opportunity to succeed."[5]

Teledesic agrees with the Commission's assessment of satellite/terrestrial sharing and endorses its tentative conclusion that separate frequencies should be designated for satellite and terrestrial services in the future. Teledesic also agrees with the Commission's articulation of the overarching policy goal: to "provide the various proposed systems with the best opportunity to succeed."[6] The identification, *a priori,* of discrete frequency bands in which each service may flourish without being constrained by the other is likely to be the best way to ensure that each system enjoys the operational flexibility, and freedom for technical innovation, that it needs to

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[5] *NPRM* ¶ 12.

[6] *Id.*

succeed.[7] Any imposition of *a priori* operational constraints will limit flexibility, inhibit technical innovation, and in most cases impose cost burdens that will make the service less affordable for users.

For these reasons, Teledesic urges the Commission to give very careful thought to whether its "Wireless Underlay" proposals will undercut its policy of identifying separate bands for satellite and terrestrial services. The theory of these proposals appears to be that the spectrum should be used to the maximum extent possible, and that *some* type of terrestrial use is possible without burdening satellite operators who are providing service in the same bands. In practice, however, it may be that *any* attempt to define the appropriate operational constraints will lead to exactly the sort of conflicts the Commission is attempting to avoid. Even if the sharing criteria are expressed as limitations on terrestrial service as a matter of form (due to the designation of FSS as the "predominant" service in these segments), in substance the criteria will reflect trade-offs between satellite and terrestrial operations. They will also be based, necessarily, on technical capabilities at a single point in time, and there is considerable danger that such an approach will inhibit technical innovations that might otherwise be possible.

These problems may not be insurmountable, and Teledesic looks forward to the suggestions offered by terrestrial interests (and others) regarding the actual implementation of this theoretically attractive proposal. For example, it might be that some terrestrial services can be viably provided on a secondary basis. In the end, however, the Commission should not adopt any band plan that leaves open any significant possibility for future conflict between satellite and terrestrial interests.

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[7] *See NPRM* ¶ 11.

CONCLUSION

The Commission is to be commended for its thorough consideration of future spectrum needs and its attempt to address those needs *before* a clash of interests makes it politically difficult to manage the spectrum in a rational and responsible manner. Teledesic looks forward to the contributions of other interested parties on this matter, and to the healthy debate the Commission's proposals deserve.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Mark A. Grannis, do hereby certify that a copy of the foregoing **Comments of Teledesic Corporation** have been sent, via first class mail, postage prepaid on this 5th day of May, 1997 to the following:

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