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April 27, 1995

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

BY HAND DELIVERY
Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: Ex Parte Presentation
ET Docket No. 94-124

Dear Mr. Caton:

On April 26, 1995, representatives of Teledesic Corporation ("Teledesic") met with Federal Communications Commission ("Commission") representatives to discuss matters related to issues addressed in Teledesic's comments and reply comments in ET Docket No. 94-124 and written ex parte filings in CC Docket No. 92-297 and ET Docket No. 94-124. In the course of the meeting, the attached document, "Preliminary Comments Of Teledesic On The Bellcore Interference Analysis", was distributed and discussed. Teledesic was represented by Russell Daggatt, President, Larry Williams, Director of External Affairs, and the undersigned. The Commission representatives included Cecily Holiday, Deputy Chief, Satellite and Radiocommunication Division, Tom Tycz, Chief, Satellite and Radiocommunication Division, Robert Pepper, Chief, Office of Plans and Policy, Don Gips, Deputy Chief, Office of Plans and Policy, and Greg Rosston and Amy Lesh of the Office of Plans and Policy.

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Pursuant to Section 1.1206(a)(1) of the Commission's Rules, an original and two copies of this letter and its attachment are enclosed. Copies of this letter are being provided simultaneously to the Commission representatives identified above.

Very truly yours,

Tom W. Davidson, P.C.

cc: Cecily Holiday, Esq.
Mr. Tom Tycz
Dr. Robert Pepper
Mr. Don Gips
Mr. Greg Rosston
Ms. Amy Lesh

PRELIMINARY COMMENTS OF TELEDESIC ON THE BELLCORE INTERFERENCE ANALYSES

The following discussion is based upon a preliminary analysis of the report prepared by Bellcore pursuant to a contract with CellularVision ("the CellularVision Report") entitled "Interference Analyses for Co-Frequency Sharing of the 28 GHz band by the Local Multipoint Distribution Service ("LMDS") and the Fixed Satellite Service ("FSS")." Despite claims that CellularVision wants "to invite our competitors in the satellite industry to work with us to find a compromise," CellularVision has refused to exchange information with the satellite parties. Teledesic was refused the opportunity to discuss the report with either Bellcore or CellularVision even after making numerous written and oral requests. Although CellularVision "officially" announced the results of the CellularVision Report on April 11, they refused to make it available to anyone who would be in a position to evaluate it on its merits. Teledesic was not provided a copy of the CellularVision Report by CellularVision or Bellcore and was only able to obtain a copy from a third party on April 25, giving Teledesic's engineers less than a day to analyze the report prior to these comments.

The CellularVision Report claims to represent a continuation of the work done last year by the 28 GHz Negotiated Rulemaking Committee ("NRMC"). The work of the NRMC took place over a long period of time in which ideas and proposals concerning co-frequency sharing could be carefully analyzed and subjected to peer review. The CellularVision Report has not been subjected to either careful analysis or peer review. After thoroughly considering and evaluating numerous sharing proposals, the NRMC concluded that none of the proposed solutions were "deemed feasible by any combination of LMDS and FSS proponents." Report of the LMDS/FSS 28 GHz Negotiated Rulemaking Committee, at 85 (Sept., 23, 1994). NRMC facilitator Bill Luther stated in Communications Daily on September 27: "My conclusion is that the analysis shows that [FSS and LMDS] sharing is really not possible." The CellularVision Report itself confirms the conclusions of the NRMC: (1) FSS terminals will cause significant interference into LMDS receivers at distances up to several kilometers; and, (2) multiple FSS terminals within one LMDS cell will degrade or disable service of a significant percentage of the LMDS receivers in the cell.

As in the case with any study, it is critical to examine the assumptions that underlie the analyses. The CellularVision Report is based on the assumption that LMDS should be the primary service in the band and that FSS should be accommodated as a secondary service. Thus, the CellularVision Report places the entire burden for sharing on FSS providers. Both FSS and fixed terrestrial services are presently designated as co-primary in the 28 GHz band. In contrast, LMDS has not been authorized in the 28 GHz band. The CellularVision Report completely reverses this scheme by proposing a Rube Goldberg "spectrum protocol," leaving it to satellite parties to figure out how to implement this bizarre proposal, leaving CellularVision free to deploy its current, one-

way analog system design without modification. In doing so, the CellularVision Report effectively relegates satellite service to secondary status in the band.

Teledesic's preliminary review of the CellularVision Report reveals numerous flaws and inaccuracies.

- The Report only analyzes the interference between LMDS and two specific FSS systems and does not take into consideration the full use of the band by other FSS systems.

- The Report evaluates sharing possibilities using only the CellularVision LMDS system architecture and one other; other LMDS system architectures which are proposed to be deployed in the 28 GHz band and were considered by the 28 GHz Negotiated Rulemaking Committee have been ignored.

- The CellularVision Report uses statistical averaging to mask the significant interference that will be experienced by LMDS subscribers within LMDS cells in areas where there is a high concentration of LMDS and FSS terminals.

- The CellularVision Report does not even address the interference from the FSS transmitter into the LMDS subscriber-to-hub link.

- CellularVision's proposed band segmentation approach only allows the FSS to use a portion of the band on a time-shared basis and will not solve the interference problem because it fails to take adjacent cell LMDS use into account; additionally, this approach will be extremely difficult to implement.

The CellularVision Report is flawed and inaccurate in numerous respects. For example, even the title of the CellularVision Report is overstated and misleading since only two proposed FSS satellite systems have been considered. Teledesic and Spaceway will not be the only two FSS satellite systems proposed in the 28 GHz band. A number of additional 28 GHz satellite systems with characteristics that are different from Teledesic and Spaceway will surely be submitted once a cut-off notice is issued by the FCC. Nearly 150 Ka band satellites or satellite systems already are on file with the International Telecommunications Union (ITU). Of these, 33 have reached the notification stage at the ITU and therefore have been, or are likely to be, deployed within the next three years. This strongly suggests that a large number of satellite proposals can be expected at 28 GHz in the United States.

The CellularVision Report also is incomplete because it defines LMDS only to include the proposal made by CellularVision and one other party. The CellularVision Report does not take into consideration the system architecture of any other LMDS proponent including that of Video/Phone. This reflects a problem that arose throughout the Negotiated Rulemaking --LMDS claims to be whatever suits its proponents at any given time, in any given forum. For example, CellularVision claims that LMDS can provide

two-way interactive capabilities, yet their actual system architecture lends itself neither to two-way capabilities nor to any spectrally-efficient digital modulation approaches. CellularVision claims that LMDS is "here now," but what is here is a one-way, analog system architecture that precludes more advanced interactive digital capabilities.

In the Negotiated Rulemaking, CellularVision asserted that it could provide a "back channel" capability in the 2 MHz interstitial spectrum bands between their video channels. Yet now, in this CellularVision Report, they propose to let these same 2 MHz bands be used for satellite service. Neither use is practical. No RF engineer would seriously propose to transmit and receive at an LMDS hub in essentially the same frequencies. The transmitter would jam the receiver. This is why Dudley Labs has proposed to separate the hub-to-subscriber bands, which would be located at 41 GHz, from the subscriber-to-hub bands, which would be located at 28 GHz.

CellularVision's use of a "system-wide availability" level of 99.9% to attempt to establish the availability of interference-free LMDS is misleading. By using system-wide statistical averaging to average over time and over a large enough geographic area, the CellularVision Report has masked the severe local interference that can occur within individual LMDS cells that have a high concentration of LMDS and FSS terminals. Such an approach is flawed because it does not address the fact that an FSS user will interfere with all LMDS users in a particular LMDS cell each time the FSS user operates his or her terminal. In fact, in many cases the request for service will come from Teledesic terminals which are located in close proximity to each other near a major population or business center. In such a situation, an LMDS user in the area will experience interference for a majority of the time.

The CellularVision Report proposes a form of band segmentation that would only allow the FSS to use a portion of the band on a time-shared basis. Specifically, CellularVision proposes the use of 2 MHz interstitial spectrum between its video channels for Teledesic's low data rate terminals and the allocation of one video channel within each LMDS cell for Teledesic's T-1 terminals. This proposal is similar to one advanced by CellularVision in the Negotiated Rulemaking where it proposed 2 MHz [instead of 20 MHz for one video channel] of spectrum for use by the FSS within each LMDS cell. This proposal was analyzed and rejected by the Negotiated Rulemaking because it failed to take into consideration interference from Teledesic terminals into adjacent LMDS cells. For reasons similar to those identified in the Negotiated Rulemaking, this latest CellularVision proposal will not work because of the potential of interference from a single Teledesic transmitter to LMDS subscribers located in several adjacent LMDS cells. Moreover, the Report does not recognize the virtual impossibility of implementing such an approach which would require coordination among individual channels of independent FSS and LMDS systems with a variety of different system characteristics on a time-basis.

The analysis contained in the CellularVision Report ignores the interference from the Teledesic and Spaceway transmitters into the subscriber-to-hub link (i.e., the back channel). Analysis by the NRMC showed that in clear sky conditions a T1 Teledesic

terminal cannot be placed within a 0.8 km radius of the hub and in rain a Teledesic terminal located anywhere in the LMDS cell will interfere with the subscriber-to-hub link. Since LMDS proponents other than CellularVision (e.g. Video Phone) are proposing to use LMDS for symmetric data delivery ignoring the back channel is a major flaw in the analyses contained in the CellularVision Report.

While the CellularVision Report fails to advance a viable approach to solve the interference problem in the 28 GHz band between LMDS and the FSS, it graphically depicts the significance of the interference problem between LMDS and the FSS that does exist in the 28 GHz band. Thus, the NRMC Report and the CellularVision Report clearly show that a Teledesic Standard Terminal ("TST") located on the roof of a house near the edge of a LMDS cell will cause interference to LMDS subscribers for blocks around whenever the TST operates. The particular LMDS channels interfered with will change with time as a function of the Teledesic cell loading.

The NRMC Report and the CellularVision Report also clearly show that a TST located on the roof of an office building near a LMDS hub will cause interference to LMDS subscribers throughout a large portion of the cell whenever the TST operates. Again, the particular LMDS channels interfered with will change with time as a function of the Teledesic cell loading.

The basic proposition underlying the CellularVision Report and the one that should be most seriously questioned is that the United States should authorize an incompatible terrestrial service like LMDS in the 28 GHz band, which is the uplink portion of the only international satellite allocation that can accommodate a global, broadband satellite service.