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November 22, 1993

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: Ex Parte Presentation
CC Docket No. 92-297

Dear Mr. Caton:

On behalf of Suite 12 Group ("Suite 12"), petitioner in the above-referenced rulemaking proceeding, enclosed please find two (2) copies of a report prepared by engineer-inventor Bernard B. Bossard regarding the positive benefits which accrue to the public from the availability of wideband communications services.

The report reiterates why the prudent allocation of the 28 GHz spectrum band for Local Multipoint Distribution Service ("LMDS") for the provision of video, voice and data services is in the public interest. Importantly, with the allocation of two 1 GHz blocks of spectrum per service area, LMDS will offer an immediate competitive alternative to cable television throughout the United States.

In addition to the role of LMDS as a viable alternative to cable, the report further details how the wideband allocation for LMDS can offer a number of other significant and beneficial services to consumers, including public service broadcasting and narrowcasting, education, health care, small business use, large business use, expansion of internet and the information highway, entertainment and a variety of additional services.

No. of Copies rec'd 0+1
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Please place these two copies of this report in the above-referenced docket. Questions regarding this report should be directed to the undersigned.

Sincerely,

Michael R. Gardner
Charles R. Milkis
Counsel for Suite 12 Group

Enclosures

cc Thomas Tycz, Deputy Chief, Domestic Facilities Division
Robert James, Chief, Domestic Radio Branch
Harry Ng, Senior Engineer, Satellite Radio Branch
Susan E. Magnotti, Esq.

THE NEED FOR WIDEBAND SERVICES

by

Bernard B. Bossard

SUMMARY

This paper describes the various reasons why the allocation of the 27.5-29.5 GHz band for Local Multipoint Distribution Service (LMDS) for bilateral distribution and reception of video, voice and data services is in the public interest.

The immediate and primary need for this bandwidth, to accommodate two competing services of a minimum 1 GHz bandwidth each, is to provide an alternative to the current television cable distribution system having the same bandwidth capacity. Moreover, the allocation of 1 GHz bands each to two licensees per service area engenders competition within the LMDS approach itself, insuring from its inception its responsiveness to the consumer market, and providing alternatives for the public whom it serves.

The LMDS needs an equivalent bandwidth in order to be able to compete on an equal basis with cable, offering the rich diversification of services which include not only entertainment, but public service broadcasting & narrowcasting, education, health care support, small & large business use, and communication with the Internet & "information highway."

These areas of public service are examples of the rich legacy of communication benefits that can be provided by LMDS to the general public provided that this promising new service is allocated sufficient bandwidth, i.e. at least 1 GHz per licensee, to compete with the present and entrenched cable delivery system of services.

INTRODUCTION

Communications capabilities are an intimate facet of our society. The development of the telephone played a pivotal role, enabling the growth of cities and large corporations, by reducing the need for face-to-face communications in human interactions. However, there remain many instances in which the limited bandwidth of the telephone, and hence its limited functionality, simply is inadequate to replace the visual information transfer that occurs with face-to-face communication.

The future availability of affordable high bandwidth communications capabilities can serve in many more instances as an acceptable substitute for face-to-face communications. This can be expected to have as dramatic an effect in the coming decade as did the introduction of the voice telephone in the early part of the 20th century.

The range of activities which can be facilitated today by the availability of wide bandwidth, affordable communications capabilities ranges from public service broadcasting and narrowcasting, to education, health care, small and large business use, as well as the expansion of Internet & the "information highway", entertainment and a variety of additional services.

In this paper we omit the general "entertainment" industry. Its needs are well known and its desirability by the public sufficiently understood, particularly the public interest need of providing consumers with an alternative means of video service to cable television.

Rather, the focus of this paper is on the non-entertainment opportunities which become accessible by widely available, low-cost, bi-directional communications. The point is not that entertainment benefits are unimportant, but rather that there are a whole host of additional positive benefits which accrue to the general public when bi-directional wideband communications become economically available to everyone. The result is efficient management of the spectrum for the public good, benefitting the greatest number of individuals.

Six specific application areas are discussed in this paper to show briefly how they can benefit the two-way video, audio and data communications afforded by wide bandwidth communications. This list is not exhaustive. Rather it constitutes the most beneficial and presently known applications of integrated wideband communications as, historically, communications evolve to be more complex and encompassing than first realized. For example, the current widespread use of FAX transmissions was hardly envisioned during the early introduction of the telegraph and telephone. Also, cellular telephone usage has surpassed all previously made.

PUBLIC SERVICE BROADCASTING & NARROWCASTING

The currently available methods for providing information to communities use either the allocated portions of the radio spectrum or cable television coaxial cable delivery. The

"non-local" because the signal range of low frequencies is so vast. Similarly, the cable television infrastructure is generally a privately owned, large corporate asset not oriented to community service. By contrast, cellular high bandwidth radio communications, which can be designed for the 27.5-29.5 GHz range, offers the prospect of more affordable communication capabilities which can, by virtue of their relatively small cell size and high information transmission capacity, provide both information and entertainment services on a community by community basis. The comparatively low cost of non-digital, analog receivers for such systems, and the fact that a huge capital infrastructure need not be created to provide service, portends well for the availability of community services at more easily afforded rates.

Community service can include the provision of ethnically or culturally oriented programming. This may be considered within the scope of entertainment, although the small target audience and confined material content helps to preserve ethnic diversity, a heritage, and a service to the public which goes beyond entertainment.

Just as there has been a trend at the national level to make government more accessible to the general public by broadcasting House and Senate proceedings, along with a host of regulatory processes ranging from Ethics Committee hearings to FCC meetings and hearings, the full range of state, city and local government processes can be made more accessible by wideband communications. Indeed, this public enlightenment is a cornerstone of our democracy.

EDUCATION

There is a major and unfilled need to provide retraining across a broad range of industries. Such retraining is required both on-site in college campuses and industry plants, as well as in the home of the recipient. Wide bandwidth, bi-directional communications will allow a much more cost effective delivery of both forms of retraining. This can be expected to develop into a substantial business in its own right, and, more importantly, will facilitate the employment of our general labor pool within the increasingly efficient, flexible and competitive world environment.

Similarly, wide bandwidth communications will facilitate the delivery of third level education more equally among social and economic groups. Given the significant portion of the population which cannot readily pursue on-campus educational programs (for example, those who have low income and/or are single parents), the opportunity to pursue education from home represents a major benefit, one with considerable impact on the public good.

A long running and successful example of this at the university level can be found in Britain's Open University [2]. This institution was established in 1971 with a goal to provide higher educational access to adults who had, for any reason, missed their primary educational opportunity. Today, there are four schools at the undergraduate level offering programs in humanities, social sciences, education, science, technology and mathematics.

There are also postgraduate continuing education programs with an emphasis on technologies that include computer science, robotics and electronics. The Open University model first developed in Britain has served as a model for similar approaches in more than thirty countries. The opportunity for this service is materially enhanced by the availability of economical wideband communications.

It is also reasonable to expect that cooperation between educational institutions both within a region, and between regions, at educational levels ranging from elementary through post-graduate, will be significantly enhanced by wideband communications. These communications will allow for resource sharing and group cooperation to improve both the cost effectiveness and efficiency of education. For example, excellent teachers and professors can reach a wider audience, and scarce lab equipment will be demonstrated beyond the confines of its specific location.

Early examples of such cooperation include the National Technological University, university-level education with emphasis on continuing education, and the Project Jason [3] effort organized by Robert Ballard of the Deep Submergence Laboratory at Woods Hole Oceanographic Institute. This latter effort is targeted at primary school children, allowing them to participate by means of real time video links with scientists as they explore the depths of the Mediterranean Sea with robotic submersibles in archeological and geological research programs.

HEALTH CARE

While the U.S. currently enjoys the world's highest level of health technology, there are major problems in its administration. First, the cost of health care has become a staggeringly heavy burden on the Nation's economy. Second, there is a large segment of the population for whom care is not available.

Providing the capability for wide bandwidth communications among health care professionals, thereby facilitating teleconsultations, is a step toward extending the application of our health technology to a greater segment of the public.

While physicians currently consult by means of the telephone, the ability to share simultaneously diagnostic images, physiological data, patient histories, and even joint examinations through high quality audio, video and data sharing offers prospects of major improvements in the clinical field of teleconsulting, a rapidly expanding technique. [4]

SMALL BUSINESS USE

Small businesses play an increasingly important role in the Nation's economy, with most job creation coming from this segment. While small businesses have the inherent advantage that they can react quickly to market opportunities and can target rich markets effectively, they must become ever increasingly efficient in the receiving and disseminating

of information about marketing, purchasing and sales - functions performed by dedicated private professionals in large businesses.

Wide bandwidth, bi-directional communications can be the basis for such resource sharing among small businesses, sharing that is timely and efficient. This sharing can help them maintain their competitive edge and with it their ability to generate jobs in the increasingly competitive world economy. In fact, given sufficiently flexible and affordable communications capabilities, groups of small businesses can work together collectively in order to fulfill the requirements of business opportunities as they arise, engendering opportunistic cooperation.

LARGE BUSINESS USES

A reciprocal of the opportunity for small businesses to combine their strengths is the opportunity for large businesses to decentralize their operations, thereby gaining the advantages associated with small businesses, while using the capabilities provided by wide bandwidth communications to retain their large businesses capabilities. Immediate opportunities can be seen in work-at-home and work-from-home jobs for sales and service personnel, as well as the sharing of various corporate functions such as legal support.

Both large and small businesses will lean towards a "virtual corporation" with a minimum of fixed infrastructure that can use seamless wide bandwidth communications and

distributed computation to organize both flexibly and efficiently, to meet the ever changing needs of the marketplace. Tools which provide the infrastructure to allow the development of these organizations incrementally accommodate the development of our Nation as the economic powerhouse of the future. Because the capital costs of radio-based, wide-bandwidth, non-digital communications in the 27.5-29.5 GHz range are relatively low and are incurred only as the service is used, the CellularVision technology is the only one that can provide the Nation with these benefits.

Moreover, there are ancillary benefits to replacing face-to-face communications with wide bandwidth electronic delivery communications. For example, there will be reduced need for commuting to and from work, resulting in less traffic congestion, air pollution and use of non-renewable, imported, energy products. Similarly, the ability to work at or from home promises to ease the burden of child care, improving the quality of life for a large portion of the public.

INTERNET AND THE INFORMATION HIGHWAY

The Government sponsored Internet has been a phenomenal success in connecting the world's technical and scientific communities, thereby dramatically improving their productivity. While this system has been successful, it has mainly provided institutional access to communications capabilities and information sharing. By providing the capability

to connect private and small organizations cost effectively on an as-needed basis to the Internet backbone, the advantages of the Internet can be much more widely accessible.

CONCLUSION

These areas represent only the beginning of the wide bandwidth communications legacy. It can be expected that affordable, bi-directional wide bandwidth communications, operating in tandem with the revolution in computing, will have as massive an impact on our society as did the earlier revolutions in printing and telephony. While we can try to imagine now the effects of such revolutionary changes, these earlier experiences tell us that we are likely to fall very far short of appreciating their scale and extent. Based on such previous applications, many of the benefits of wide bandwidth communications, because they have been widely discussed, very likely will be realized once these communications are made available.

It is easily envisioned that a portion of the LMDS spectrum might be used in a metropolitan area just to satisfy the needs of the areas listed here. Yet other areas can be expected to arise once the communication capacity is experienced, just as did a wealth of unforeseen applications arise within the telephone infrastructure. The key for LMDS is a large bandwidth allocation, on the order of 2 GHz[1], both to satisfy the initially foreseen applications such as these, and to provide capacity for new application growth.

It is always difficult to predict what the future holds for the final modulation schemes necessary to provide high picture resolution and quality for large screen performances. Nor is it possible to predict which applications will grow first. Frequency planning and distinct allocation within the 2 GHz is premature. This should be allowed to evolve as the market demand for these services develops. It is necessary that the wireless system have the same intrinsic channel capacity as exists in wired (cable and fiber) systems. Otherwise, those interests will inhibit the rapid growth of these wideband new communication opportunities and eliminate their contributions to the public good.

The advent of issuing licenses by competitive bidding is anticipated to raise substantial sums of money for the U.S. Treasury. If LMDS licenses are issued by auctions, potential bidders for the spectrum allocated for LMDS will recognize the great value of the spectrum and will, therefore, be willing to bid higher prices for a 1 GHz block of spectrum than they would for just a portion of that block of spectrum. In this case, due to the wideband nature of LMDS, the whole (1 GHz) is significantly more valuable than the sum of its parts (500 MHz plus 500 MHz). The Commission may very well cripple the goal of its LMDS rulemaking proceeding, namely, to create an immediate and viable alternative to cable, it fails to provide LMDS operators with equivalent tools with which to compete with incumbent cable and fiber operators—thus reducing the value of the LMDS spectrum. We note that some European countries have offered potential operators utilizing millimeter wave technology the full 28 GHz block of spectrum.

REFERENCES

[1] In the Absence of the Sacred, Jerry Mander, San Francisco, Sierra Club Books, 1992.

[2] Britain's University of the Air, Harold G. Shane, Futurist v23, pg 25, July/August 1989.

[3] Franklin Institute to Participate in Live Satellite Link from Floor of the Mediterranean, PR Newswire, Nov. 16, 1988.

[4] Extended Clinical Consulting by Hospital Computer Networks, Editors: Donald F. Parsons, Carl M. Fleischer, Robert A. Greenes, Annals of the New York Academy of Sciences, Vol 670.

ENDNOTES

1. Due to their differing characteristics, a 2 GHz allocation of an LMDS digital system is equivalent in channel data carrying capacity to a 714 MHz bandwidth cable system.