

SPECIAL SERVICES TO NEIGHBORHOOD AND HOME: A COMMUNITY TELECOMMUNICATION DEMONSTRATION CONCEPT

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Summary This paper discusses the potential impact of cable television or broadband communications on the urban environment. It suggests that the availability of improved two-way communications between individuals and public institutions presents new opportunities for delivering social services in a cost effective manner. Also, that this mode of delivery may be superior in other ways to our present system of delivery. Unanswered questions do remain on the use of technology for this purpose, however, and to answer these questions an experimental demonstration in one or more “real” cities is suggested so that future urban telecommunications systems can be designed with social service delivery in mind.

Introduction The paper was prepared from the vantage point of the Office of Research and Technology in the Department of Housing and Urban Development. The objectives of HUD’s research program are to develop a better understanding of the causes of the complex problems that are faced in housing and community development; and using that improved understanding to apply the resources available to encourage change, innovation, improvement, and modernization as a means of solving those problems.

The coming of cable television or broadband communications to urban America presents a technology for use that appears to have widespread consequences for the future. Much of this has been widely discussed in the literature in the past few months. The authors first became fully aware of the potential of broadband communication for urban areas because of their association with the National Academy of Engineering Committee on Telecommunications when that Committee was preparing its report to Federal agencies on the potential of using modern telecommunications to solve pressing urban problems.¹ Part of the problem facing the nation now is that a cable television system is being put into place, but not enough systematic thought from an overview position is being brought to bear on how this technology can be used to solve urban problems.

This paper suggests one approach to find out how to use broadband communications in addressing urban problems.

Communications Evolution Telecommunications services have grown piecemeal in our society. Many telecommunication systems are operating near capacity in spite of recent high growth rates. Communications technology has already had impacts on our society which are at the same time profound but immeasurable. Telecommunications has already strongly affected the need for physical transportation, the efficiency of transactions between people, the education of children and adults, the availability and impact of up-to-the-minute news, and the kinds of entertainment enjoyed by most of the population. There is a need for governmental assistance to assure that a major new form of communications, cable TV and broadband communications, is brought into the existing U.S. communications network in a way that will assure delivery of maximum benefits to the public and private sectors.

The coming of cable systems to the nation's cities during the 1970's offers a unique occasion and an opportunity. A single coaxial cable has about 50,000 times the message-carrying capacity of a pair of telephone wires. It can carry from 28 to 35 channels of television, plus the AM and FM radio bands and a substantial amount of non-visual electronic messages. Additional capacity can be secured by laying additional cables. This capacity is obtained without reducing the valuable radio spectrum resource. These systems are capable of both one-way and two-way transmission and represent a major and probably revolutionary addition to our patterns of communications. The timing of these developments coincides with recent progress in other technologies of telecommunications. The potential benefits of combining domestic communication satellites with cable systems is far greater than could be realized with either system operating alone. The growth of the specialized common carriers and the attractiveness of customer-owned interconnection to telephone common carrier lines provide added opportunities in system designs to achieve a broad range of services. The developments in integrated circuits and computer software, particularly in time share systems, provide the potential of low cost, versatile terminals in the home.²

The opportunity that the coming of broadband cable presents, is the sheer variety and abundance of the services and combinations of services of which it is capable. The problem is the complexity of integrating various combinations of cable services with various combinations of existing telecommunications. There are large numbers of possible uses; possible technological alternatives for providing the services; audiences to be served; possible benefits to business and the public.³ The task of demonstrating, testing, quantifying the requirements and demand and evaluating the marketability and cost effectiveness of the full range of possibilities and combinations, cannot be undertaken either by municipalities with their heavy financial commitments and their lack of expertise

in communications, or by private industry within the limits of risk capital. This is particularly true in that a broadband communication industry does not exist except in the form of fragmented small businesses.

The National Academy of Engineering Committee on Telecommunications after a 17 month study for a consortium of Federal agencies concluded that modern communications technology, thoughtfully applied, can help in relieving many urban problems that are in urgent need of solution. The Committee believed that communications can also help in upgrading the level of city life. The Committee's conclusions were further supported by an in-depth study of city operation, an exchange of ideas with urban experts and city officials, and a survey of a cross-section of U.S. cities. The Committee recommends an immediate attack on city problems through innovative applications of modern communications technology.⁴

There are a number of questions that relate to the overall hypothesis suggested by the NAE Committee. Some of these issues that must be faced are:

1. Will the availability of improved two-way communications between individuals and public institutions, for the purpose identifying problems and arranging for solutions, help relieve alienation of individuals and relax community tensions?
2. Will the use of improved two-way telecommunications technology significantly help the institutions responsible for providing public services to be more responsive to individual and neighborhood needs?
3. Will the public services that can effectively utilize modern two-way communications technology generate enough demand to support private investment in the two-way system?
4. Will thoughtful application of communications technology be an effective technique to make available in every neighborhood new forms of cultural, educational, and health care services?
5. Will the use of modern communications technology result in improved quality of services available to individual consumers at lower unit costs?

An experimental demonstration is in order to obtain the answers to the questions set forth above. The hypothesis to be tested is that communications technology can and should be used to provide information and public services to the home and neighborhood. It is believed that public services information available now by the use of telephone can be improved through a better system to-coordinate and provide public information and

services to the home either through telephone or other methods. These services may be provided in conjunction with an increased availability of commercial services. However, not all individuals will be able to obtain information or services in their home either because they cannot or choose not to have communications equipment in their home or they are transients without a residence but still in need of service. Accordingly, to meet this need and to provide an option for some services being delivered more effectively in an aggregated form, it is proposed that Community Information and Service Centers (CISC) be established to provide information, public services and personal counseling as well as to serve as an alternate location for providing information and public services being delivered to homes.

Benefits of Widespread Application of a Broadband System Potential benefits of a mature system are discussed briefly below. It is suggested that these are the types of benefits that could be anticipated from the widespread use of an urban system. The benefits although not directly achieved initially, could be preliminarily evaluated by a test of sufficient scale.

(1) **HELP RELIEVE SOCIAL AND POLITICAL ALIENATION OF INDIVIDUALS, FROM GOVERNMENT AND COMMUNITY**

It has long been felt by local community groups, particularly but not exclusively those representing minority and disadvantaged citizens, that the concentration of media control is a major problem and detriment to their progress in the society. The sense of community, responsible community participation and minority involvement in the solution of urban problems will increase as these groups gain access to a medium for self expression.

(2) **IMMEDIATE RESPONSE TO INDIVIDUAL AND NEIGHBORHOOD NEEDS**

Improved communications will re-establish individual relationships between the citizen and local government, and provide a basis for governmental officials to understand and respond to the needs of citizens as these needs are articulated. Individual and group hostilities will be reduced by providing local government with a system that can accurately identify needs, and can respond to these needs.

(3) **PRIVATE INVESTMENT DIRECTED TOWARD PUBLIC PURPOSES**

Each of the enumerated benefits is responsive to a defined need and national priority. The framework provided through the basic communications facility offers an opportunity for the accelerated incorporation of private capital into a series of product investments responsive to these public purposes.

(4) CULTURAL, EDUCATIONAL AND HEALTH CARE SERVICES AVAILABLE IN EVERY NEIGHBORHOOD

Many citizens are precluded from the use of cultural facilities in the community by cost, lack of information, travel time and availability, or working hours. Each of these considerations can be ameliorated by bringing an increased variety and selection of cultural events to the home. A further advantage is the opportunity to provide greater cultural diversity to the community, recognizing the needs of the minority or ethnic groups.

Two-way communications and the availability of a large number of channels open up broad new opportunities for the delivery of educational materials, from pre-school to higher education. Health care delivery can become more efficient by making the skills and knowledge of skilled professionals at central locations available to outlying regional hospitals and clinics through two-way visual communication links, and by making increasing use of paraprofessionals who, under a doctor's supervision, can do much of the semi-professional work often done today by the doctor. The use of paraprofessionals to broaden the availability of health care will, in turn, require localized communications that can be provided by interactive community cable facilities.

(5) REDUCED COST OF IMPROVED QUALITY SERVICES TO INDIVIDUAL CONSUMER

Localization of municipal and public agency services at the neighborhood level lowers the unit cost to the citizen of using these services, and makes them more responsive and accessible. Government can then satisfy citizen needs more effectively without commensurate increased in cost.

Citizens pay for educational and health services on a labor intensive basis, at the highest rate required to support professional services. Communications techniques may reduce the cost of service by permitting the use of professionals in a purely professional capacity, and through the distribution of the costs of services over a greater number of individuals.

A Demonstration Program If the benefits to society listed above are to become a reality, a large investment, private or public, must be made in a broadband communications system in the next few years.

A demonstration is recommended because a meaningful test of the market potential is required to remove the uncertainty involved in a system where economic feasibility requires that many users desiring a great diversity of service will pay sufficient fees to support the overall service delivery system. This test could be approached by a four element program; namely,

- (1) Experimental multi-site, multi-service two-way information systems providing a wide variety of services,
- (2) A set of experimental Community Information and Service Centers where most public services can be delivered to provide a dynamic interface between governments and their citizens,
- (3) Software support for local governments, public services, consumer education, protective surveillance and other use uses, and
- (4) Overall determination of the public acceptance and market potential of each service or facility demonstrated.

A most critical part of the demonstration would be the sample size of those involved in the demonstrations -- the subscribers. The sample size must be of such a size as to involve a critical mass of participants and allow for extrapolation to the universe of population in the United States. We suggest that the sample should be of sufficient size to be statistically valid, and that more than one location should be used for experimental purposes. This might include, for example, a central city and a new community. Both types of communities have significant social problems and the problems are potentially quite different.

A second crucial item is to amass a critical mass of services for delivery via the telecommunications system. There are a wide variety of social services that are candidates for experimental use. Most likely any social service with a high informational content could be a tentative candidate. Numerous lists of these have already been postulated and need not be repeated here.⁵ There include services usually offered by government, e.g. education; mixed government and private sources, e.g., health services; and completely private, e.g. shopping at home. A meaningful test should include as many as possible of these diverse offerings so that an economical system design for multi-purpose use can emerge.

The third item is of considerable concern to the authors. Some households cannot afford the cost of an interactive home terminal in the foreseeable future. Others will choose, for reasons other than economics, not to have such equipment available in the home. This becomes particularly important if an analysis of social service delivery via telecommunications shows that it is cost effective to implement such a program on a widespread scale.

We suggest that any contemplated experimental demonstration should face this problem. One alternative is to provide a common terminal in a central neighborhood location. This

would be located in a multipurpose neighborhood facility.⁶ This Community Information and Service Center (CISC) would provide a central point to which citizens could bring questions and problems relating to a wide variety of municipal services. The CISC program might utilize numerous neighborhood based centers in many parts of a city linked by two-way communication systems to local government administrative agencies and public service agencies, and they would also serve as community programming origination centers for the CATV system. These facilities would provide a basis for the evaluation of the effectiveness of producing immediate response by local government to individual needs, and provide neighborhood access to broadband communication origination capability. This element is critical because CISCs provide a mechanism to assure that 100 percent of the population may receive services if social services direct to the home become a prime delivery mode. For those households who choose not to have the newer forms of two-way communications available at home, a means for public service delivery could still be available at the CISC. In addition, the CISC would be a focal point for service delivery to the neighborhood when it is not practicable to provide home based delivery. Initially, functions such as alerting citizens to procedures and providing information as to the proper agency from which direct follow-up may be obtained could be performed. Servicing of the requests directly via remote telecommunication links from the CISC to the appropriate municipal department would be a longer term goal for the centers.

Planning The experimental demonstration suggested above could not be carried out on the scale envisioned without a considerable planning effort. It is easy to say what can be done and what should be done. It is not easy to do. To do -- one needs programs, software, trained personnel, detailed experimental designs, evaluation plans, and equipment that is compatible with other equipment and with available software. Without this planning a demonstration would only prove that money can be spent on telecommunications. We think that we do not need to prove this again. Instead we suggest a few months effort to answer the following questions.

1. For what community problems and needs will telecommunications service delivery provide solutions?
2. What services are candidates for initial, large scale experimentation?
3. What experimental system concept and format should be followed?
4. How can the experiment be operated?
5. How can meaningful evaluation be accomplished?
6. How can the experiment be managed, what is a realistic schedule and budget?

7. What would the impact on society be of such a delivery system -- would it cause more problems than it solved?

After the answers to these questions are known, the decision to do or not to do can be made.

Conclusions The use of broadband communications to deliver social services to homes and neighborhood centers is as revolutionary an idea as the automobile has proven to be. Data, based on actual use of the system, should be analyzed before a complete national policy emerges. Up to the present time, there has been no clear Federal role in the area, except that the Federal government is a regulator.⁷ The future Federal role is also unclear in advancing this technology and bringing its benefits to the nation. What is needed is information which can only be obtained through demonstration activity that will test the full range of possible applications, discover and develop audiences, develop programming sources and make a meaningful test of the market, in order to remove the uncertainty involved in a communications form where economic feasibility requires that many users desiring a great diversity of services will pay sufficient fees to support the overall system of communications and delivery. Federal involvement in a demonstration activity may be desirable, but with demonstration activity completed, the Federal government could withdraw from its catalytic role and public and private uses of the cable can proceed on the basis of demonstrated usefulness, profitability, and cost effectiveness. An important reason for failure of many socially oriented experiments in the past has been the lack of planning and experimental design. Therefore, considerable effort in planning the experiments and adequately stating the questions to be answered and evaluated by the particular experiments must be expanded. For this reason, early efforts to adequately describe the experiments and the hypotheses to be tested should be undertaken.

References

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2. An excellent description of this can be found in Edwin B. Parker and Donald A. Dunn, "Information Technology: Its Social Potential," *Science*, Vol. 176, pp. 1393-1400, June, 1972. See also state-of-the-art technology discussions in Ronald K. Jurgen, "Two-Way Applications for Cable Television Systems in the '70's," *IEEE Spectrum*,

Vol. 8, pp-39-54P November, 1971; and Gerald M. Walker, "Special Report: Cable's Path to the Wired City is Tangled," *Electronics*, Vol. 45, PP. 91-99, May, 1972.

3. Numerous uses are outlined in John J. O'Neil and Sidney Polk, "Service: The Immense Benefit of Cable," *Public Management*, Vol. 54, pp. 8-11, July, 1972. Also see: William F. Mason, *et al.*, "Urban Cable Systems," *op. cit.* and Walter S. Baer, "Interactive Television: Prospects for two-way Services on Cable," The Rand Corporation, Santa Monica, California, 1971.
4. "Communication Technology for Urban Improvement", *op. cit.*
5. See references listed in footnote 3.
6. Neighborhood facilities under specified circumstances are eligible for Federal Support for up to 3/4 of facility construction. See Title VII, Housing and Urban Development Act of 1965, 42 U.S.C. 3101.
7. See Federal Communications Commission, "Cable Television Report," *Federal Register*, Vol. 37, No. 30, part 2.