

*The Feasibility and Value of Broadband
Communications in Rural Areas: A
Preliminary Evaluation*

April 1976

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Of Broadband Communications
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NOTE

Additional copies of this staff report, prepared originally as a working paper for use of the Senate Committee on Agriculture and Forestry, have been published in order to facilitate further discussions of this topic.

PREFACE

In a letter dated June 25, 1974 to the Director of the Office of Technology Assessment, Senator Herman Talmadge, Chairman of the Senate Committee on Agriculture and Forestry asked "if OTA would consider a project to determine the feasibility and value of experimental efforts to develop public service for rural areas through the use of broadband communications techniques." Senator Talmadge further expressed his interest in the contribution broadband communications might make to the broad objective of "rural community development."

Although communications technology has not been designated by the Technology Assessment Board as one of the principal areas for analysis during OTA's early years of operation, it is of central importance to the functioning of our society and is an area that the Board could designate for formal assessment activities in the future. For these reasons, and to provide a basis for response by the Board to Senator Talmadge's specific inquiry, a long-term exploratory study was undertaken by OTA staff. The study had the twin objectives of exploring the relationship between broadband communications and rural development, and identifying what further activities, if any, OTA might undertake in this area. This report is the product of that effort.

At its 13 April 1976 meeting the Technology Assessment Board elected to transmit this report to the Committee on Agriculture and Forestry. Although the report is a specific response to Senator Talmadge's request,

it is only a first step and falls short of a full assessment. An approach for additional activities, if desired by the Committee, is outlined at the end of Chapter I.

An earlier draft of this report was reviewed by a number of knowledgeable individuals who contributed many helpful comments and suggestions. These individuals, for whose help the Board is indebted, are as follows:

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This study was conducted by William Mills, Gretchen Kolsrud, and Lucia Turnbull of the Office of Technology Assessment. Consulting assistance was provided by Robert Spongberg of the Denver Research Institute. In addition, many individuals gave freely of their time and knowledge and their assistance is appreciated. These individuals are listed in Appendix B.

INTRODUCTION

The letter from Senator Talmadge which led to this OTA staff study raised two questions that are of profound importance to the future of rural America.

The first has to do with overcoming the problems of low population density and geographic isolation through innovative uses of existing broadband communications technologies. (These are combinations of cable television with two-way capability, ground or satellite based microwave links and/or automatic broadcast repeater stations.) Broadband systems provide a means to link doctor and patient, teacher and pupils, police sub-station and headquarters; in other words, to substitute communications for travel in the delivery of public and commercial services. For these applications, the question raised by the Senate Committee on Agriculture and Forestry is one of feasibility and value -- can such systems be economically feasible in outlying rural areas and, if so, what would be their worth?

The second major question raised by the Committee takes the implications of such uses a step further and asks what contribution their adoption might make to the broad goals of rural development as spelled out in recent legislation. Can broadband systems contribute to the economic development of these regions? How might their widespread adoption affect the balance between rural and urban areas? Might they increase the attractiveness of rural areas as places in which to live?

What gives these inquiries special timeliness are recent events of perhaps historic proportions. For the first time in this century, the exodus from rural areas to cities has been halted. Since 1970, both population and economic growth have been greater in rural than in urban areas. While it cannot be known how long these trends will persist, there currently is momentum for change and new-found prosperity in some rural sections of the country. If these trends are further reinforced by circumventing fundamental rural problems of geographic isolation and low population density through the expanded use of communications, the opportunity might be at hand to help reach the national goal of more balanced growth.

Over the past decade and more, much has been written about the use of communications to decentralize industry to rural areas and in so doing transform the nature of our society. Similarly, a good deal of federally-supported experimentation has been conducted into means for delivering health care, education and other public services through the medium of television and other forms of communication.

In view of the high promise of such innovations, the reality of their actual use has been the more disappointing. To date, almost none of these non-entertainment broadband services have been incorporated into operating cable systems. A 1975 survey by the National Cable Television Association revealed only 31 of 644 operators leasing channels for non-entertainment purposes. Concerning education specifically, in only 5 percent of the systems surveyed was use extensive enough to warrant the exclusive assignment of a channel for this purpose. As of now, not one system exists which

offers to outlying rural areas the full range of broadband services that could be supplied.

Relating this experience to the prospects for rural broadband systems, the outlook at first glance is discouraging. Unlike systems in more densely populated urban settings, those in sparsely settled rural areas are not likely to pay their own way if confined to conventional television. In fact, the major barrier to extension of systems beyond town limits has been this reliance upon entertainment services as a principal source of revenue. Where population density of potential subscribers willing to pay \$7 or \$10 a month for entertainment falls below 30 to 40 per mile, cable extension typically is not economically feasible. However, there may be cause for a more optimistic outlook if public service and commercial uses of broadband are used as additional sources of revenue and combined with subscriber fees from conventional network television.

A cause for optimism in thinking that rural operators might succeed in assembling combinations of services derives from the potential savings to be realized in a rural setting. Because distances and thereby transportation costs are higher, potential savings from reducing student travel might make a given broadband service economically attractive in a farm area where it might not be in a city. Also, because of low population density, a doctor in a rural area might greatly magnify his effectiveness and income -- through a broadband link to remote clinics, where this is less likely to be so with a city doctor whose patients live close by.

Nonetheless, development of broadband systems in rural areas which exploit all potential uses and revenue sources is a task of considerable magnitude. Regulators and industry alike have tended to be preoccupied with the uses of broadband in densely populated urban areas. The FCC, seeking to encourage the non-entertainment uses of cable, has endorsed the concept that channels should be available for non-entertainment purposes free-of-charge. While this might make sense in a large urban system that can make a profit solely from revenues received from entertainment, it is of little help to a rural system that might depend upon revenue from non-entertainment services as a crucial source of income.

However, despite the apparent logic of a full-service system in which revenue is derived from public services, commercial users and subscriber-based entertainment fees, the concept has not been tested. A limited demonstration program to test this concept would seem to be a natural next step from single service applications of broadband communications which have been so frequent in the past decade. Unlike experimental studies, which have emphasized and demonstrated technical capability to meet public service needs, the objective of the demonstration would be to determine how several services might be combined into an economically viable system. Services would be drawn from the broad classes of subscriber-based entertainment, public service and commercial use as these are needed by the particular community in which the demonstration takes place.

The demonstration program outlined in this study may be contrasted with the approaches outlined in recent studies and in a number of legislative initiatives. These alternate approaches fall into two groups. On the one hand are those which suggest that a large-scale government program, modeled on the Rural Electrification Act of 1934, should be undertaken

to make low cost loans available for rural broadband systems. Such programs might be premature when the best way to produce economically viable broadband systems in rural areas has yet to be determined, Alternately, other legislative initiatives have proposed the need for demonstration programs to evaluate public service applications of broadband communications. However, these bills are not directed at rural areas, and the projects would probably not take place in such areas because the funds are for studies on existing systems. Systems with significant channel capacity and two-way capability are generally located in urban areas. The unique needs of rural areas, and the fact that economic viability may rest on differently weighted factors in rural and urban areas, suggest the need for demonstration programs specifically directed at meeting rural needs.

As a final note, this study had its origins in a request for information on the feasibility and value of employing broadband communications to deliver public services and contribute to the objectives of rural development. Having found that these subjects are relatively unexplored, the study does not resolve these questions but instead describes an approach for seeking out the answers. Additionally, it gives one view of the role of broadband communications in rural development as well as of the steps that might be taken to further their deployment. What action might be taken in connection with the latter, of course, will depend upon broader considerations of federal policy towards rural development.