

CHAPTER III

RURAL DEVELOPMENT AND BROADBAND COMMUNICATIONS

Although communications has been commonly portrayed as an agent of possibly revolutionary change in American life, the aim here is limited to considering the contribution that broadband might make to the specific goals of rural development as spelled out in recent legislation on the subject.

In the last decade there has been increasing concern about the tendency of the United States population to concentrate in urban areas. The attendant congestion, pollution, strain on public services, increase in crime and similar characteristics of urban living have suggested that the present and projected scale of urbanization in the United States may not be desirable. Concern was greatly exacerbated by the riots in Watts, in Detroit, and in other urban areas (1-3; 2-3).¹ As a result, beginning in 1970, the concept of a national growth policy was developed which had as its premise the need to redress the balance of population between urban and rural areas. This policy was described in such legislation as the Housing and Urban Development Act of 1970 and the Agricultural Act of 1970, and was the subject of recommendations by the Citizen's Advisory Committee on Environmental Quality of 1971 (3-3). Congress also gave explicit consideration to how such change was to be accomplished. For example, the Rural Development Act of 1972 aimed to improve the quality of life as well as employment opportunities in rural areas and thereby increase their attractiveness compared to urban areas. Concerning the priority to be accorded rural development Title IX of the Agriculture Act of 1970 specified that:

¹References are numbered consecutively in the order of their first appearance in the text. The first number is the reference. The number after the dash is the page number in that reference.

"The Congress commits itself to a sound balance between rural and urban America. The Congress considers this balance so essential to the peace, prosperity, and welfare of all of our citizens that the highest priority must be given to the revitalization and development of rural areas."

Although the legislation cited is of recent vintage, Federal programs for the last forty years have had a great impact upon rural America in such areas as agriculture, transportation, electrification, and social welfare. Because of the long duration and complexity of change in rural America, the approach taken in the Chapter is to try to identify those key economic and social forces that seem to underlie the major alterations now underway. Subsequently, an attempt is made to show how broadband systems of varying configurations might meet the future needs created by the continued operation of these economic and social forces. Future needs are addressed because the establishment of area coverage rural broadband systems also lies in the future; none presently exists.

Rural-Urban Population Distribution And Migration Patterns

This section explores distribution of population in rural and urban areas and recent patterns of migration between these two areas. There are two reasons for doing this. First, one objective of rural development is to affect the balance between rural and urban population size and, in this study, we are interested in the role broadband communications might play in such an alteration. Therefore, it is important to identify current trends so that it can be seen whether the objective towards which such systems might contribute would be helping to initiate a shift in population towards rural areas or helping to facilitate (or constrain) a shift which is already

occurring. Second, the characteristics of populations in rural areas will determine the types of broadband services which can best meet the needs of rural people. For example, a high proportion of youngsters implies a need for educational service. Medical services are especially important to an area with a high proportion of older residents.

Our investigation in this area resolved itself into a series of questions. The material in this section has been organized around these questions. As will be seen, not all questions have satisfactory answers, or where answers are provided, the data are sometimes less complete than desired.

Definitions

There are a number of definitions of rural and urban. For example, the Department of Agriculture by statute uses several different definitions, ranging from open country and places of 1,500 people up to all cities of less than 50,000 population. The U.S. Bureau of the Census defines rural as "open country residents and people in towns of up to 2,500 inhabitants" (4-669). The diversity of definitions has caused the Rural Caucus to request a survey of definitions of "rural" from the Library of Congress.¹

In this section, the terms "metropolitan" and "nonmetropolitan" will be used rather than "urban" and "rural". The reason is that the available data on recent population trends are organized in these terms. (In overall totals, the differences between "rural" and "nonmetropolitan" are not large: 53.9

1 Definitions of rural and urban are necessary not **only to** explore population trends but for purposes of identifying the applicability of various sources of Federal funds to support rural applications of telecommunications. This is discussed in Chapter IV of this report.

million were classified as rural in the 1970 census; 54.3 million as nonmetropolitan.)

The metropolitan area is a county in which there is an urban nucleus of at least 50,000 people. Adjacent counties are included if 30% or more of the population commute to the urban core. If less than 30% but more than 15% of the workers commute, the adjacent county is still considered metro if it meets two out of three subsidiary criteria considered characteristic of metro areas. These criteria refer to density, degree of urbanization and rate of growth. Other areas are classified as nonmetropolitan (4-669; 5).

In The Recent Past And Today, How Many People Live In Metro Areas And How Many Live In Nonmetro Areas?

While the overall U.S. population increased from 1950 to 1974, the percentage of those in nonmetro areas has declined from 33% to 27%. A closer examination shows, however, that the tendency for the population to concentrate in metro areas is decreasing. From 1950 to 1960, the percentage of population in nonmetro areas fell from 33.3% to 29.0%, a drop of 4.3 percent. From 1960 to 1970, the nonmetro proportion continued to drop, but at a lesser rate of 2.3 percent. Thus, in 1970, 26.7% of the population lived in nonmetro areas. Finally, in the period 1970-74, the trend reversed itself, with nonmetro areas showing a net gain to 27 percent of the country's population, (1950 and 1960 based on data in 6-21; 1970 and 1974 based on data in 7-2).

What Are The Recent Trends In U.S. Population Growth? How Do Metro And Nonmetro Growth Rates Differ?

The rate of U.S. population growth *is decreasing. Growth in the 1960-1970* decade was less than in the 1950-1960 decade. The 1970-1974 figures suggest that the 1970-1980 decade will show even less growth.

When U.S. population growth is subdivided into metro and nonmetro growth, it is clear that growth in metro areas in the last 25 years has declined more precipitously than that of the U.S. population as a whole. Between 1970 - 1974, U.S. population *grew* by 4.0 percent whereas metro areas grew by only 3.4 percent. Nonmetro areas, on the other hand, grew by 5.6 percent during the same period (7-1). This is the first time in the twentieth century that nonmetropolitan growth has exceeded metropolitan growth (2-6). (1950, 1960, 1970 based on data in 6-21; 1974 based on data in 7-2.)

One Factor Which Could Cause A Shift In Population Between Metro And Nonmetro Areas Is Migration. (Another Is Different Birthrates.) How Have Nonmetro Migration Patterns Changed Over The Last 25 Years?

Between 1950 and 1960, migration from nonmetro areas exceeded emigration by more than 6 million persons or more than 12% of the 1950 based population of 50.4 million persons. In the 1960-1970 decade, nonmetro areas still lost more population than they gained but by half the rate of the preceding decade.

The 1970's have seen an actual reversal of previous nonmetro losses. Over the last four years, a net of 1.6 million persons moved into nonmetro areas, a 3% increase over the 1970 base population of 54.3 million persons. (1950, 1960, and 1970 based on data in 6-21; 1974 based on data in 7-2.)

How Has The Birthrate In Metro And Nonmetro Areas Affected Population Growth?

Between 1971 and 1974, a higher birthrate in nonmetro areas appears to have contributed to a higher population growth in nonmetro areas as compared to metro areas. During this period, the largest metropolitan areas of the country showed the greatest decline in birthrates. While

fertility rates of metro and nonmetro areas converged from 1940 to 1970, during the period cited there appears to have been a divergence, with higher rates in nonmetro areas (2-13 ff.). However, higher birthrates are not the major explanation of nonmetro growth. Changes in migration patterns have played a predominant role as described above.

Does The Shift In Population Towards Nonmetro Areas Represent Suburban Sprawl? Is It Simply Migration To Rural Areas Adjacent To Metro Areas?

Migration from metro to nonmetro areas does not simply reflect expansion of existing urban areas. Of the 1.6 million persons moving into nonmetro counties in the period 1970-74, 62% moved into counties adjacent¹ to metro areas. However, 38% moved into counties not adjacent to metro counties. These changes are particularly dramatic when compared to migration movements in the preceding decade, in which non-adjacent rural counties lost 2.3 million people. (Based on data in 7-2.)

What Proportion of Nonmetro Counties Are Expanding In Population?

The U.S. is made up of 3100 counties or county equivalents (5-2). Of these, 630 are metro and 2470 are nonmetro. Somewhat more than half (1461) of the nonmetro counties are not adjacent to metro counties. These are the most rural counties.

The 1970's were characterized by a large increase in the proportion of nonmetro counties which are growing, especially nonmetro counties not adjacent to metro areas. For example, 84% of nonmetro adjacent counties were growing in the 1970-1973 period compared to only 60% in the 1960-1970 decade. For nonmetro counties not adjacent to metro counties, the change

¹Counties classified as adjacent are characterized not only by geographic proximity but also because at least 1% of this force commuted to the metro central county for work (6-12).

in the proportion of growing counties is greater. In 1970-73 period, 70 percent were growing, whereas in 1960-1970, only 39 percent were growing (6-23).

Migration patterns are playing a major role in growth. There has been a sharp increase in the 70's in the proportion of nonmetro counties growing by net immigration (6-23).

Is Most Of The Migration Into Nonmetro Areas To The Most Densely Populated Places?

In absolute numbers, more than half this migration has been to rural counties adjacent to metropolitan areas, which are on the average most densely populated. However, the sharpest increase in migration has occurred in the less densely populated areas. Additionally, within counties of both categories, growth has tended to be greatest outside the corporate limits of towns (6-22).

Is Nonmetro Growth Limited To Certain Sections Of The Country?

No. As stated in Reference 2 (pg. 7): "As measured by migration trends, all states but three (Alaska, Connecticut and New Jersey) show it (increased retention of population in nonmetro areas) and two of the three exceptions are controlled by events in military base counties. Nonadjacent (to metro areas) counties have had some net immigration in every major geographic region."

Factors Underlying Rural Development

As has been shown, there is reason for believing that the long-term decline of many rural areas of this country is presently in the process of reversal.

The object of this section will be to survey some of the major explanations that have been advanced for this development. The third and final section of the Chapter will bring these theories to bear in an attempt to understand the changes now underway in three principal categories of nonmetropolitan counties; to identify the indicated future needs of the rural areas in question; and, finally, to consider the role that broadband communications might play in addressing these needs.

Decentralization Of Manufacturing

In the decade of the 1960's, the principal engine of economic change in rural America was the growth of manufacturing. As farm employment continued its decline, nonfarm jobs took up the slack and grew at a faster rate than in urban areas. Manufacturing dominated this growth in rural nonfarm jobs and increased at an annual rate of 4.6 percent during the decade. This growth occurred at the expense of urban areas; by the end of the decade 25 percent of all U.S. manufacturing was located in rural areas, up three percent from 1960 (8-1),

¹ While it is not the purpose of this study to attempt to break any new ground in understanding the factors underlying rural development, existing literature on the subject is unsatisfactory in that it does not provide comprehensive theories of development that can account for recent data on rural population changes. In this section, the subject is approached in the form of a critical commentary upon several of the prominent theories of rural development. In view of the limited scope of this study, this analysis is not definitive; rather, it represents a useful way to "think about" the subject of rural development.

This growth in rural manufacturing -- as well as the recent reversal of migration from rural areas -- seems to undermine the hypothesis of many scholars that there will be ever-increasing urban dominance. However, this hypothesis is still influential. To accommodate and explain such departures from the historical trend of rural decline, it has been suggested that growth of manufacturing in rural areas involves dying industries which migrate to rural areas in search of cheap labor or land. According to this view, nothing is really changed by such relocation: urban areas will continue to take the lead in inventing and developing products; the rural areas will remain the temporary lodging places of dead-end and low paying enterprises that do little to develop further their economic base. Wilbur Thompson describes the process as follows:

"In national perspective, industries filter down through the system of cities, from places of greater to lesser industrial sophistication. Most often, the highest skill requirements decline steadily as the production process is rationalized and routinized with experience. As the industry slides down the learning curve, the high wage rates of the more industrially sophisticated innovating areas become superfluous. The aging industry seeks out industrial backwaters where the cheaper labor is now up to the lesser demands of the simplified process" (9-8).

One team of researchers, after analyzing industrialization in 24 rural counties, concluded that rural areas might be permanently condemned to a position of inferiority compared to the rest of the economy:

"This type of firm (likely to relocate to rural areas) faces serious problems whenever the national economy goes through a period of below-normal growth. Because of the highly competitive nature of their industries, and because these firms do not usually have large cash reserves, they are especially vulnerable in periods of tight money, or low consumer demand. . .

It may be even more important to note that those industries normally contributing the most to rural growth are also the industries that tend to grow more slowly than the national economy even in a period of national prosperity. As the economy becomes more affluent, the service industries grow more rapidly than do the manufacturing sectors, while within manufacturing itself the 'light' industries most important in rural manufacturing, such as textiles, food, and lumber and wood products, tend to lag behind their 'heavy' counterparts. Thus, in general, rural *industrialization can never yield the same long-run growth rates as the national economy*" (10-60). (Italics added)

If these analysts are right, and if this kind of industrialization for rural America is in some way preordained, then it follows that there is little that broadband communications or any other technology can do to alter the pattern.

The evidence, however, does not completely support this theory. While employment in apparel and other low technology industries has accounted for much of the sharp increase in rural manufacturing employment, an analysis by Claude C. Haren of the U.S. Department of Agriculture of nationwide rural industrialization in the 1960's reveals a far more diverse and growth-oriented picture. Haren states that:

"Undoubtedly the greatest increment in rural areas was in products that found direct or fairly direct outlets in consumer channels. But, notably within and on the margins of the Great Lakes Industrial Belt and in parts of the Upper Southeast, many items manufactured by new plant additions or expansions were primarily for the industrial market. . .

Added or enlarged were firms producing not only farm fertilizers, but pharmaceuticals and a broad range of industrial chemicals. In addition to plants turning out farm machinery and equipment, a far greater and increasing number were manufacturing industrial machinery, control equipment, transformers, electric generators, motor vehicles and parts, and aircraft and aircraft components. Blast furnaces, reduction plants, and rolling mills were installed at strategic small cities and towns,

notably along the Ohio and Mississippi Rivers. Even more numerous and varied were expansions in metal-working facilities for the production of such industrial hardware as dies, machine tools, structural metal, stampings, piping, and tubing" (11-433).

A second development undercutting the theory that rural industrialization inevitably is limited to low technology industries is the demonstrated growth in rural areas of precisely that 'service" sector of the economy that has been the hallmark of urban dominance. This will be discussed next.

Decentralization Of The Service Sector Of The Economy

Of all the economic developments that might lessen the past trend of urban centralization in our society, none would be of greater long-range significance than the relative growth in rural areas of the non-goods producing service sector of the economy.

The characteristics of the service sector and the reasons why it has been of central importance in understanding the heretofore dominant influence of urban areas were eloquently described by Wilbur Thompson as follows:

"The true economic base of the great city-region (lies in) the creativity of its universities and research parks, the sophistication of its engineering firms and financial institutions, the persuasiveness of its public relations and advertising agencies, the flexibility of its transportation networks and utility systems, and all the other dimensions of infrastructure that facilitate the quick and orderly transfer from old dying bases to new growing ones. A diversified set of current exports -- breadth -- softens the shock of exogenous change, while a rich infrastructure -- depth -- facilitates the adjustment to change by providing the socioeconomic institutions and physical facilities needed to initiate new enterprises, transfer capital from old to new forms, and retrain labor.

Large places are also better based to adapt to innovations originating elsewhere. With a wider assortment of educational institutions and more professional counseling, local workers may be more quickly retrained from declining to expanding occupations. Reemployment can often be achieved within the same local labor market, eliminating the very difficult residential relocation characteristic of smaller places" (9-8).

Although metropolitan counties continued to lead in the growth of the service sector through the 1960's, there is now evidence that this historic trend as well, may be in the process of reversal. In a November, 1975, statement before the House Post Office and Civil Service Committee, Calvin Beale, of the U.S. Department of Agriculture said:

"Since 1970, employment in all major industry groups has grown at a faster rate in nonmetropolitan than in metropolitan areas with the exception of government jobs. *In other words, the pace of employment growth in trade, services, construction, transportation and utilities, finance, and real estate has followed the lead set by manufacturing in the 1960's*, and is more rapid in the rural and small town areas than in the metro cities and their suburbs. This growth was interrupted by the current business recession, but since the Spring of 1975 it appears that the nonmetropolitan areas are recovering from the recession faster than the metropolitan areas are" (7-3). (Italics added)

Despite this recent evidence, however, there are still those who contend that this rural resurgence is more apparent than real. In their view, what is being reflected in these statistics is simply urban expansion in another guise, with cities extending their physical limits-- and presumably the location of their service industries -- by incorporating adjacent rural areas. Commenting upon increased rural growth rates in the Upper Midwest, Neil C. Gustafson of the Upper Midwest Council said recently:

"Recent interpretations of these trends have led many people to believe that urban expansion has been abruptly halted or even reversed. Closer investigation of these data, especially as they related to the Upper Midwest, indicate that such conclusions require clarification. Most of the population growth in the Upper Midwest has been and continues to be urban expansion, but the range of urban growth has extended far into the countryside and to the small towns within commuting range of the employment centers. The largest volumes of recent population growth in the Upper Midwest remain near and related to major urban areas" (12-15).

As it happens, there is another group of experts who have analyzed the same outward movement of population and service industry from urban cores and has found evidence not of simple urban expansion, but rather of the evolution of a new kind of rural-urban hybrid which they label "urban fields". These they define as being "a fusion of metropolitan areas and nonmetropolitan peripheral areas into core areas each with a minimum population of 300,000 persons and extending outward for approximately one hundred miles, that is, a driving distance of about two hours" (13-13).

Concerning the specific characteristics of these amalgams of cities and the fastest growing rural counties, Niles Hansen found them typically to rank high in the following kind of service industries: wholesale and retail trade, transportation, finance, insurance, and real *estate* (13-39).

The Federal government, although not using the term "urban field", has in recent years incorporated such hybrids into their adjacent metropolitan areas. According to Claude Haren, 83 metro fringe counties, including "a strong representation of essentially rural and partly rural units were added in the past several years to the Indianapolis, Columbus, and other

SMSA's, primarily on the strength of having specified percentages of their work forces commuting to the core counties in which those and other SMSA central cities are located" (8-8).

It cannot now be known with certainty how or whether rural areas can share in this growth of the service sector of the economy and still maintain their identity. Alternatively, they might wind up being submerged either in urban sprawl or in the more scattershot, but still potentially as anonymous, character of life in urban fields. The third section of this Chapter will address the role broadband communications might play in helping to foster a less dislocating, and more rural-centered, form of development.

Residential Preference

A third factor that has had a sizable influence upon the relative growth of rural areas in recent years has been the growing preference of a majority of the U.S. population to live in rural areas or small towns.

In 1970 Louis Harris and Associates reported that while 68 percent of the population lived in cities, only 48 percent expressed a desire to continue living there (3-17). Subsequent polls refined this stated preference to being one for living in nearly rural or small town areas. However, Calvin Beale has pointed out that these polls also indicated that a more remote rural or small town area was the expressed second choice of those preferring to live in the country (2-16). Another survey cited by Beale which dealt with the likelihood of persons actually moving on the basis of their stated preferences, showed three-eighths indicating they were "very likely" to move to rural areas within "the next few years" (which translates, according to Beale, into 14 million potential movers) (2-17).

Clearly, whatever disagreement might exist over the fine points of these analyses, a sizable fraction of the urban population would prefer to live in rural areas.

Of course, unless there is also some realistic prospect that these people can subsist in rural areas, such an expressed desire would remain of academic interest. The prospect for such a move, however, has become more realistic for an increasing fraction of the urban population.

First, as cited by Niles M. Hansen, jobs are increasingly less resource and land-tied. While this does not dictate a shift from urban to rural areas, it does permit vastly increased mobility:

"It has been estimated that whereas less than forty years ago nearly 30 percent of the labor force needed to be located close to natural resources, today only 7 percent are resource-bound. Thus, the great preponderance of workers now are potentially 'footloose' or must locate in proximity to consumers who themselves are relatively footloose, and economic opportunity is associated less with land and natural resources and more with the presence of capital and human skill" (13-8).

Second, the combination of increased disposable income, governmental programs such as the Interstate Highway network, early retirement, increased vacation time, and changing lifestyles favoring outdoor recreation, has led to and made possible increased population movement to rural areas. Although some of the data cited below have probably changed due to the recent recession, Hansen's 1973 description of the many factors at work gives some indication as to why more dissatisfied city dwellers have been able to vote with their feet:

"In the past metropolitan growth has tended to draw off productive population and investment capital from hinterland areas, but in the future centrifugal

forces will reverse this pattern. For one thing, the hinterlands have space, scenery, and communities that are increasingly attractive to metropolitan populations. Demand for these resources is being generated by rising real income, greater leisure, and increasing mobility. Personal income in 1972 has been estimated at \$920 billion, a gain of almost 50 percent in a five-year period. Over 40 million Americans now work under employment conditions entitling them to three-week vacations. Federal law now provides five three-day weekends each year, and a trend toward a four-day work week is clearly in evidence, with about two thousand companies now following this procedure. Earlier retirement has been encouraged by improved pension plans and high Social Security benefits. Access to nonmetropolitan hinterlands has been vastly improved; for example, when the Interstate Highway System is complete an estimated 3.5 to 7.5 million acres will be opened for development.

Dollar sales of leisure equipment (an estimated \$105 billion in 1972) have increased by 52 percent over the past five years, reflecting an accelerating desire to 'get back to nature'. A survey by the Department of the Interior indicates that three quarters of the American population nine years of age and older is involved in some form of outdoor recreation. . . Moreover, about two million American families own second homes used for vacationing, and the number is increasing each year by from one hundred and fifty thousand to two hundred thousand units. . . About one third of the total mileage driven in private automobiles is devoted to getting to and from vacation areas. Clearly, satisfying leisure-time desires already represents a major opportunity for many nonmetropolitan areas, and growth prospects in this regard have few parallels" (13-13).

The lengthy list of enabling factors just cited is the more impressive because of its sweep and diversity. Should economic conditions, for example, cause a downturn in outdoor leisure activities, other trends less susceptible to short term economic fluctuations, such as the increased use of rural areas as retirement locations, could help to sustain the long-term shift to these areas. In this connection -- and this might presently be helping to counter the effect of downturns in other economic activities affecting migration to rural areas -- it is relevant to note that so-called

rural "retirement" counties (net immigration of 15 percent or more of persons aged 60 and over) have taken the lead as the most rapidly growing class of nonmetro counties in the 1970's (2-10). Further to this point, Beale has distinguished 60 nonmetropolitan counties in which the number of retirees receiving Social Security payments increased by more than 50 percent between 1970 and 1975 (7-4). In total, "retirement" counties in rural areas now account for a population of 8.7 million in 377 separate counties (2-11).

If it is likely that some sizable fraction of the urban population will continue to prefer living in rural areas and small towns, and if the evolution of the U.S. economy makes it increasingly possible for city-dwellers to act upon their preferences, then the quality of public services and the amenities offered in rural areas becomes especially important in affecting the future course of this migration. Once some sizable fraction of the American population is not required to live in a given area because of sheer economic necessity -- and as soon as their movement is able to be more voluntary and discretionary -- then relative attractiveness for daily living becomes an important factor affecting rural growth. This development and the possible utility of broadband communications in improving the quality of public services in rural areas will be further addressed in the next section of this Chapter.¹

¹ It should be emphasized that this survey of the factors that underlie the recent reversal of urban dominance in population growth has been highly selective. Left out were such factors as the location of state colleges and other state facilities, and the revival of such traditional rural enterprises as mining operations, both of which have been identified as causes for growth in rural counties not adjacent to metropolitan areas (14-15). Also omitted in trying to distinguish the common denominators of rural growth was a stated

recognition of the diverse nature of rural America. It is far from the case, for example, that every rural county within two hours driving time of core cities can be considered as part of an "urban field". Nor is it true, as another example, that decentralization of manufacturing has made its influence felt in all rural areas. As described by Claude Haren, an equally large or larger number of nonmetropolitan counties has not been affected by industrialization, especially in the areas of the Great Plains, the Intermountain Region, and Alaska (8-12).

This selection of decentralization of manufacturing and decentralization of the service sector of the economy, plus residential preference, as the major forces underlying the recent population growth in rural America does not reflect a conclusion that only these forces are of significance. At the same time, it should be noted that decentralization of manufacturing and of the service economy are the principal distinguishing characteristics, respectively, of those nonadjacent and adjacent rural counties that have shown the greatest growth in recent years. Residential preference, in turn, seems to have accounted for that rural growth which is not strictly economic in origin.

Rural Needs And Broadband Communications

The foregoing commentary addressed two basic questions:

- how is rural America changing?
- what are the forces underlying these changes?

It was suggested that the decentralization of manufacturing and of the service economy, each with its unique implications for rural areas and each roughly descriptive of the respective course of development in the two major categories of growing rural counties, seemed to underlie the growth in rural population. A third factor -- residential preference -- was introduced as a factor likely to be of importance in both categories of growing rural counties.

It is now necessary to spell out the future problems that might be created by the continued operation of these forces. Subsequently, broadband communications will be considered in terms of the role it might play in helping to resolve such problems and meet rural needs. In so doing, three major categories of rural counties will be considered:

- Turnaround Acceleration (service sector decentralization)
- Turnaround Reversal (manufacturing decentralization)
- Declining

Turnaround Acceleration Counties

Hansen characterizes "turnaround acceleration" nonmetropolitan counties as those which grew rapidly in the 1960's after having gained some populations in the 1950's (13-4). Typically, these counties are adjacent to or near metropolitan areas (13-32). They are further distinguished by growth in the non-goods producing, service sector of the economy.

Nature of change and its problems. On the surface, rapid growth and association with urban centers has been beneficial to the residents of this category of counties. Recently published analyses of the 1960's by the USDA's Economic Research Service confirm what other studies have found: economic "well-being" increases regularly as one moves from the most rural to the most urban parts of the country (15-64), and growing communities generally have "younger age structures, higher socioeconomic status, and higher labor force participation rates that suggest greater economic opportunity" (16-1).

It is not the purpose of this study to express judgment as to whether increasing urbanization has been as beneficial to the people concerned as these economic indicators might suggest. Nonetheless, assuming that a high level of rural growth of this kind is desirable, it is possible to distinguish associated developments that might hinder it in the future. Among these are: (1) the overload on community services created by rapid growth; and, (2) the heavy dependence of these areas upon the automobile and their consequent vulnerability to restrictions upon its use. On the other hand, if the assumption is made that rural development is desirable only to the extent that it contributes to preserving some degree of autonomy and independence, while still permitting rural people to share in the material benefits enjoyed by the population at large, then there might be some cause for concern about the basic and long-term effect of growth in this class of rural counties.

Turning first to the heavy demand that might be placed on existing community facilities, Beale believes that growth rates in a large number of rural areas already are sufficiently high to cause concern (7-3).

Although natural increase still is the primary cause of population growth in rural areas, 1970 Census statistics showed a direct relationship between rate of growth and net immigration, with the most rapidly growing counties typically receiving the highest percentage of newcomers (16-2).

Besides the added burden on community facilities created by new residents, it also should be noted that the overall median age of population in growing rural counties is almost two years less than that of declining counties (implying more families of child-rearing age, and a greater requirement for schools) (16-8).

The second factor that might adversely affect further development of this class of rapidly growing nonmetropolitan counties is their heavy dependence upon unrestricted use of the automobile. Especially in the case of rural counties that make up extended "urban fields", gasoline rationing or high gasoline prices could have a catastrophic effect upon development and upon the lives of those already residing in the areas. The following description shows how extensive this dependence upon the automobile can be:

"Just as the compact nineteenth-century city gave way to the metropolitan area, so today the Standard Metropolitan Statistical Area (SMSA) is giving way to urban fields which may include whole regions within a two-hour driving radius of the central cities. Increased incomes, leisure, and accessibility have permitted a growing number of persons to avail themselves of opportunities and amenities throughout their respective urban fields. Thus, many persons who work in SMSA's may reside in nonmetropolitan areas where residential amenities are more agreeable, and many persons who live and work in SMSA's regularly go to nonmetropolitan areas for tourism, recreation, second homes, and retirement...Moreover, urban fields need not be limited to areas contiguous to SMSA's. Areas with attractive recreation-tourism-retirement-second-home features may expand because of demand generated by metropolitan residents who live well beyond commuting range" (13-160).

Finally, there remains the more speculative aspect of growth in rural communities that are part of urban fields -- that is, the possibility that the remaining independence and sense of community enjoyed by rural areas might become further submerged in the urban-rural sprawl of widely separated shopping malls and interstate highway-associated manufacturing plants. Thompson's description of the poverty pockets and social ills that have been a by-product of the process of metropolitan expansion is indicative of what might well occur in some rural sections of the geographically more extended category of urban fields:

A growing population is accommodated, in part, by horizontal expansion, sweeping over the surrounding rural areas. Greater distances must then be traversed if any semblance of economic and social unity are to be preserved -- if, that is, the urban area is to be more than a collection of urban villagers in accidental proximity. . . The poor have *nearly always lived on the other side of the tracks, but the distances were short and contacts frequent, as in the schoolrooms and town halls. But the all-slum block becomes first the all-slum school, next the all-slum community - - the ghetto -- and threatens now to become the all-slum municipality.* What was once, if not benign, at least digestible *apartheid* at small scale portends on a larger scale unemployment, antisocial behavior, and, ultimately, recourse to even more centralization of authority. Slum schools that graduate unemployable and political enclaves of the poor that lack the tax base to support minimum public standards of health and safety invite either state or federal intervention. . . We are learning the lesson that a social structure, such as residential segregation by income, which may be viable at small scale is not necessarily viable at very large scale" (9-35/36). (Italics added)

While it cannot be predicted that urban fields will evolve in quite the manner described, the process at work in the development of urban fields bears some resemblance to that involved in metropolitan expansion, which was described by Thompson as follows:

"New modes of transportation and communication permitted great cities to dominate small cities and other communities in their surrounding tributary area. These outlying communities, heretofore relatively autonomous, became subordinate to the metropolis and integrated with it. Hence, not cities in general, but metropolitan cities in particular dominate contemporary American society" (15-3).

The additional point to be made is that, however urban fields might evolve, the physical location and relative influence of service centers -- once established - are likely to be permanent in nature and self-perpetuating. As described by Thompson in explaining the historical dominance of cities, "factories come and go... a commercial bank (or similar service enterprise) that has efficiently served first a carriagemaker then an early automobile firm and then an airframe manufacturer (survives them all)" (9-15). In short, whatever inequalities come to be built into the evolution of the service sector in urban fields -- and it was suggested that some rural sections might be bypassed entirely -- they could become lasting.

Alternative course of development. Communication systems, as with any other element of a community's infrastructure, are likely to be functional and viable to the extent that they mesh with the dominant needs and activities of that community. In rapidly growing nonmetropolitan counties, as we have seen, the dominant economic activity is that involving the growth of the service sector. Thus, while this category of county might come to experience the overload on community facilities which comes with rapid growth, and could benefit from the related public broadband services described in Chapter II, their future is likely to be most affected by the pattern in which this service sector evolves. Therefore, the effect which commercial broadband services might have upon this evolution is of most concern.

Nonetheless, it is not enough to know that the broadband services most important to the development of these counties might be the commercial services described in Chapter II. There also has to be some understanding of the purpose and function they might serve, which, in the case of this rapidly growing category, might be in helping to preserve some of the existing small towns and as well as helping to enable a more equal sharing of the prosperity of the larger region. However, since we are dealing with the future utility of broadband systems, it is necessary to have some idea as to how such counties might counter the future dislocating effects of growth in the urban field. Thus, in the case of these counties, as well with the Turnaround Reversal and Declining categories to be considered later, an alternative course of development will first be hypothesized and then the contribution that broadband systems might make to furthering this course of development will be considered.

It was earlier suggested that there might be an uneven sharing of benefits in urban fields, with some rural areas bypassed and others becoming isolated dumping grounds for the poor and untrained. At minimum, the growth of large-scale regional shopping centers and service industries widely separated and linked by high speed highways, could lead to the demise of rural communities as surely as have the previous encroachment of subdivisions and the other elements of suburban sprawl.

Thompson suggests an alternative that is a compromise to the very large-scale regionalization of the urban fields, one which "emulates" the features of large metropolitan areas while still preserving the identity and prosperity of the smaller places in it. Scaling down the size of towns described by Thompson and substituting rural communities for the small

urban areas referred to, it does represent one alternative course of development that could prove less dislocating and disruptive to the inhabitants of this category of rapidly growing rural counties:

"The small urban area might, instead or in addition, simulate greater scale. A number of small- and medium-size urban areas, connected by good highways and/or rail lines may form a loose network of interrelated labor markets. With widespread ownership of automobiles and a well-developed bus system on expressways permitting average speeds of 50 miles an hour, the effective local labor market would extend radially for 25 to 30 miles around one of the larger urban places. A couple of small cities of, say, 25,000 population, with two or three main industries each, plus a half-dozen small one- or two-industry towns of half that size add up to a 100,000 to 200,000 population.

The local labor market could then achieve the scale necessary to offer the counseling and teaching so critical in our rapidly changing economy. Area industrial development efforts could be coordinated, including common research and industrial parks. In North Carolina, a state filled with small- and medium-size urban areas, a research and development triangle has been created in the Chapel Hill-Durham-Raleigh area, which is 15 to 30 miles on a side and encloses about a quarter of a million people.

In such complexes, both public and private investments could be planned strategically. Instead of many small, bare community halls sprinkled across the area, one spacious, acoustically pleasing auditorium could be built. In place of a couple of two-year community colleges staffed as extensions of the local high schools, a strong four-year college could be supported. Nearby and inexpensive higher education -- commuter colleges -- may be critical in holding the area's talented young from middle- and low-income homes, and perhaps in attracting those families in the first place. Again, museums, professional athletic teams, complete medical facilities, and other accoutrements of modern urban life could be supported collectively. . ."

(9-27).

Role of broadband communications. Whether the availability of broadband systems will enable greater decentralization of service industries and more even growth within an urban field remains to be demonstrated. Leaving to Chapter IV the discussion of how such systems in practice could be developed, the task at hand will be to consider whether broadband systems might enable the kind of decentralization contemplated in the model presented above.

On the general subject of decentralization, the National Academy of Engineering (NAE) report on "Communications Technology for Urban Improvement," stated that "the viability of (rural decentralization) is enhanced by the transition of the United States economy from a manufacturing to a service economy. It is the service sector . . . which is expected to make the greatest use of telecommunications" (17-171).

Also cited in the NAE report was a British government report on the establishment of the "Green Belt" around London which concluded that ". . . the main factor deterring business and industrial decentralization has been the reduced operating efficiency due to the absence of fully adequate communications facilities" (17-173).

To some extent, the cited barrier of inadequate communications apparently has already been breached, as shown by movement of corporate headquarters from cities to suburbs:

"What began as a minor movement in the middle 1960's has become, by 1971, a mass exodus whose true dimensions are beginning to be visible in only one central city, New York, where the concentration of economic activities at the center is greatest. In 1965, New York City was the home office for more than 125 of top industrial companies in the United States. By 1971, at least 24 of these companies

had decided to leave New York City for the surrounding suburbs, mainly in New Jersey and Connecticut. Although the decentralization of office employment seems most advanced in New York, other cities such as Detroit, St. Louis, Philadelphia, Baltimore, Houston, Atlanta, and Los Angeles are beginning to experience corporate moves to their suburban rings that rival the outward movement of blue-collar employment in the 1950's.

Private corporations are not the only example of large national organizations that are electing to leave the central city for the suburbs. In the Washington, D.C. area, for example, where the Federal Government is the largest employer, major government offices have been moved out of the city in recent years, and for much the same reasons that affect private decision making in the area of location policy. Among the agencies that have emigrated are the National Bureau of Standards, the Atomic Energy Commission, the Geological Survey, the Bureau of the Census, the National Institutes of Health, the Navy Department, the Central Intelligence Agency, and the Weather Bureau" (18-463).

Neil Gold, in a research report for the U.S. Commission on Population Growth and the American future, identified advances in communications technologies as being one of the principle factors enabling this corporate decentralization. According to Gold, "as the effects of this technology began to be widely understood in the middle 1960's, a segment of corporate leadership concluded that the economic, social, and psychological benefits that would result from relocating their headquarters in the suburbs were an effective counterweight against the loss of physical proximity and the daily visual contacts characteristic of doing business in the urban core" (18-463).

The NAE report cited earlier takes Gold's point a step further by arguing that "the inventions have already been made to permit the design of special communications systems which will allow these (service) activities to be conducted. . .in small communities scattered throughout the nation" (17-170). In the judgment of another British study group

cited in the NAE report, the specific usages of broadband communications in linking widely separated operations are likely to include "graphic display, rapid facsimile, computer and data access, conferencing. . ." (17-173).

Concerning the application of the innovations, the most definitive experimental indication of feasibility is likely to come from the HUD-funded "New Rural Society" study now being conducted by Dr. Peter C. Goldmark.

While the New Rural Society project, when completed, could furnish hard evidence on the practicality of decentralizing service sector activities to rural areas, there is some question as to whether the rural area of Connecticut being studied is comparable in terms of economic characteristics to the rapidly growing nonmetropolitan counties considered to be typical of the category of urban fields. In other words, it might be that the New Rural Society project will be most useful in indicating the role of broadband communications in rural areas just beginning their turnaround from a state of decline (see below).

Summing up, based upon a theoretical understanding of the value of broadband communications systems in facilitating the decentralization of the service sector, broadband systems could contribute to rural development and could enable greater dispersal of industries throughout an urban field. Like the chicken and the egg, however, the broadband services involved will not be offered until proved economic -- and they will not be proven economic until integrated into an actual system. On the assumption that knowledge as to value and feasibility might attract potential system operators and break the chicken-egg cycle, Chapter IV will examine how

commercial broadband services might pay their own way in a full service, area-coverage system.

Turnaround Reversal Counties

This section will address that category of nonmetropolitan counties whose growth has been most associated with an increase in manufacturing employment. Unlike the faster growing Turnaround Acceleration group just discussed, counties in this category do not tend to be located in close proximity to metropolitan areas. As the term implies, "Turnaround Reversal" are counties in transition that have recently emerged from a period of decline. Hansen includes in this group those counties that gained population in the 1960's after having lost population in the 1950's (13-4).

Nature of rural change and its problems. As outlined earlier, the view is still common that the type of manufacturing plant likely to relocate to rural areas will be of the slow growth, low technology sort that is unlikely to stimulate further development or otherwise improve the economic base of the host area. By contrast, it was shown that actual samplings of new industry locations in rural areas reflected a far more diverse industry mix than the "urban cast-off" theory might suggest. As described by Claude Haren, many industries located in rural areas in the 1960's were of the kind previously associated with urban areas and included a sizable number producing machinery and industrial components of all kinds (11-433).

Although there were rural areas in the 1960's, particularly in Appalachia and the Ozarks, where employment grew primarily as a result of

the relocation of apparel and other low technology industries, there also was evidence of relatively depressed rural areas moving up the ladder of industrial diversification. Hansen described this process as follows:

"...the process of industrial filtering does eventually lead to the upgrading of both manpower qualifications, types of industry, and incomes. These phenomena are clearly in evidence in the South. The industrialization of the South was initiated in large measure by the movement of textile mills from New England and other northern areas into the Piedmont region of the central Carolinas. The textile mills in turn generated other activities. For example, by 1970 there were 214 establishments in the South producing machinery for the textile industry. In addition, there were 65 chemical plants involved in producing synthetic fibers; the bulk of these plants were in the states where substantial textile production has concentrated. Suppliers of dyes and other processing chemicals were also stimulated by the movement of the textile industry. The growth of manufacturing in the Carolinas, especially North Carolina, was followed by similar expansion into Georgia. Decentralization next spread to the Tennessee Valley, which has managed to achieve a higher degree of industrial diversification than either the Carolinas or Georgia. More recently, the states of Mississippi and Arkansas have entered the lower rungs of the filtering process" (13-163).

Although detailed statistics do not exist for the specific class of Turnaround Reversal counties being discussed here, it can be inferred that growth in manufacturing employment probably has had a beneficial effect. While some net outmigration is still taking place in some of these counties, the headlong exodus that characterized earlier days has been at least arrested. Referring to the USDA analysis cited earlier in the discussion of Turnaround Acceleration counties, these counties are likely to have shared in the general attributes of growing rural areas, which were found to be favorable in terms of income, age distribution, and labor force participation. In the meantime, these manufacturing-growth

related counties typically have not been burdened with a heavy influx of new residents, despite the fact that new jobs in the 1970's were being created at a rate well above the national average.

In these counties, it is not the present, but rather the long-term outlook that might be of concern. And it is the long-term ability of these counties to share in the growth of the service sector that is coming to dominate our national economy, that is open to question. Even granting that life in these counties will remain attractive to the extent that change *is slow* and the population stable, can these communities preserve their relative share of the nation's material goods while depending upon manufacturing for employment? Or, must the 'move in order to stand still' : i.e. , must there be some growth in service sector industries if they are not to be confined to a constant share of the diminishing sector that is manufacturing employment in this country?

To this point, Claude Haren, in a study of rural industrialization in the 1960's, offers evidence which suggests that growth in the service sector has not necessarily accompanied or followed an increase in manufacturing employment:

"In accordance with national trends, changes in the service-producing groups, particularly at the local or small-area level, not only diverged from but often ran counter to shifts in manufacturing and other goods-producing industries. In some instances the lack of a more substantive increase in nonbasic employment was attributable to the well-developed system of shopping facilities, hospitals, schools, and so on, already available either in the immediate or adjoining community, or at a regional service center. The retention of purchasing and related functions at corporate headquarters and similar trade leakages or complete or partial tax abatement often seriously delayed the accumulation

of investment capital and fiscal resources required to underwrite much-needed improvements in community and business services and facilities. All too typically, a high proportion of increased payrolls went to nonresidents, or added work opportunities resulted in the substitution of local employment for jobs formerly held outside the immediate area" (11-434), (Italics added)

Beale, in another study of patterns of growth, found that "...the business functions of many very small towns have diminished even though the housing function has not" (20-35). Beale concluded that these small towns have been sustained only through extensive commuting of their residents to those larger centers that picked up the business and service facilities formerly located in the small towns.

Alternative course of development. It was suggested earlier in the discussion of Turnaround Acceleration counties that communications systems, like any other element of a community's infrastructure, are likely to be functional and economic only to the extent that they mesh with the dominant activity in that community.

Since the counties now being discussed are manufacturing-centered in their growth and tend not to be located in close proximity to metropolitan areas, it would be unrealistic to expect that the establishment of broadband communications systems, in and of themselves, would lead to the burgeoning growth of service industries that was found in Turnaround Acceleration counties.

Absent those other conditions that enable significant growth of the service sector, among which is association with dynamic metropolitan areas or the hybrid urban fields, the most that probably could be accomplished for the present is to forestall further erosion of existing service industries

in these communities, enabling their subsequent expansion when economic conditions permit.

Concerning the non-economic stimulus to development in those counties, the potential seems clearer. Although attractiveness to the retired and semi-retired will vary dependent upon geographic location, many counties could capitalize upon the growing desire and ability of urban dwellers to live in the country. To do so, however, it seems likely that these counties would have to be able to offer a reasonable standard of community amenities and facilities. As pointed out earlier, the possible stake in attracting this segment of the urban population is sizable and growing: so-called rural "retirement" counties have been the most rapidly growing class of rural counties thus far in the 1970's and now account for a total population of 8.7 million in 377 separate counties.

Role of broadband communications. Although service sector need for and use of broadband communications are not likely to form the leading stimulus to the establishment of broadband systems in these manufacturing growth-related counties, still, as will be discussed in Chapter IV, any broadband system, if it is to be feasible for area-wide rural coverage, presupposes its full use for both public and commercial services. While dedicated commercial links are not likely in these counties and while the use of cable channels will be less intensive than in their more rapidly growing counterparts, the broadband system at least can be in place -- and available for increased and more extensive business and commercial use should the need arise. In the meantime, the basic system, in the manner to

be described in Chapter IV, could be built and paid for on the basis of providing those entertainment and public service uses described in the second chapter of this report. In the latter uses, these systems could help to provide that improvement in public services necessary to retain existing population as well as to help attract the retired and semi-retired.

Declining Counties

The reversal of migration from rural areas and the relative increase in employment in rural versus urban areas has not been shared by all rural areas.

Although the number of nonmetropolitan counties losing population has decreased from approximately 1,300 in the 1960's to 600 in the period 1970-73, the 600 losing population represent 25 percent of all rural counties and encompass sizable areas of the Great Plains western Corn Belt, southern Appalachian coal areas, and the old Cotton Belt (21-30).

Nature of rural change and its problems. Declining counties tend to be those in which gains in manufacturing and service employment have not counter-balanced losses in the mining and agricultural sectors. Of great importance to the future of these counties is the exodus of working age residents and the steep increase in the proportion of the elderly and the young: in 1970, the median age of the population in declining counties was almost three years greater than that in growing counties (16-40), and Beale has identified 80 declining counties in which the median age has exceeded 40 years (20-24).

Decline, in many instances, has tended to feed upon itself. As pointed out by Brown, the great majority of counties that lost population in the 1970-73 period also lost during the 1960's (16-23). Beale describes how the process of decline can be self-perpetuating:

"The important point is that any community reaching this condition is certain to be characterized by an unusually high degree of influence by the elderly on community government, by disproportionate problems of providing housing and services for the elderly, and by a scarcity of young able-bodied labor force or potential future labor force. The latter two problems may be aggravated if the population density is sparse and the typical government units are small, as is commonly the case in the Plains. It is not impossible to break the momentum of such a trend, but the condition apparently tends to feed on itself. What psychological support and incentive does a young adult have to remain in a community where the overwhelming majority of his peers and siblings have left or are about to leave? There is almost the force of a *deus ex machina* needed to break the cycle" (20-24).

At the same time that the severity of these problems should be understood, it should also be recognized that not all rural counties in this category are experiencing the same rate of decline, and all are not in the predicament described above. Concerning the rate of decline for example, a majority of rural counties losing population in the 1960's lost less than 10 percent over the course of the decade (16-37).

As will be further discussed below, the range of population decline, relative economic opportunity, and state of community facilities vary greatly among counties in the declining category. As the needs of individual counties vary, so too will the utility and configuration of the broadband systems that might serve them.

Alternative course of development (modest change counties). In the view of Hansen and Brown, some rural counties have been able to successfully adapt to a decline in population and remain viable places in which to live (13-17; 16-23). Others by contrast, have experienced a degree of deterioration in community services that has been as severe as their drop in population.

In considering the course of rural development and the possible role of broadband communications in declining areas, therefore, some account should be taken of the differing degrees of change that might be entailed in reversing or arresting decline in these areas. To preserve some sort of rough distinction in the discussion that follows, declining counties will be grouped under the headings of "modest change" and "major change". Those in which development might entail a modest degree of change will be considered first.

Hansen's analysis of some rural counties of the Great Plains reveals an apparent paradox: the same areas that generally experienced heavy population losses for several decades also ranked first in the country in terms of rate of increase in income, "... rising from an annual rate of change of 2.9 percent in the 1950's to 6.2 percent in the 1960's (13-17).

Brown, in a USDA study of growing and declining counties, stated that "... one cannot conclude that ... all declining areas are being bypassed by the process of national economic growth." Population decline, in Brown's view, may not only be transitory, but also "... may reflect a period of adjustment in the manpower needs of agriculture, forestry, mining, and other extractive industries" (16-23).

Does the evidence indicate that the residents remaining behind in some declining areas can maintain a tolerable level of economic activity and standard of living? Hansen thinks it does:

...it is difficult to compare the situation in the Great Plains, the Upper Great Lakes, northern New England and other relatively prosperous areas having heavy outmigration with the situation in areas such as central Appalachia, South Texas, the southern Atlantic Coastal Plains, and the Mississippi Delta. In the Great Plains, for example, outmigrants have generally been well prepared to take advantage of economic opportunities in other areas. Of course, the population left behind has a relatively high proportion of older people and it is often difficult to maintain essential services for a widely dispersed population. On the other hand, agriculture is viable and there is relatively little poverty. In addition to savings and farm income there is considerable income from the Federal government in the form of farm subsidies and Social Security benefits. There also are viable small towns, although they probably should be developed as service centers for rural hinterlands rather than as "growth centers" capable of halting and even reversing outmigration. Economic theory maintains that outmigration should raise the value of the marginal product of the remaining labor force, other things being equal. This is because each of the remaining workers has more of the non-labor resources of a given area with which to work. And, in fact, the evidence indicates that population adjustments in the Great Plains reflect successful adaptations not only for outmigrants but also for the people left behind. The greatest acceleration of nonmetropolitan income in the country has taken place in the Great Plains, rising from an annual rate of change of 2.9 percent in the 1950's to 6.2 percent in the 1960's (13-17).

Whether or not these areas of the Great Plains will ever achieve rapid growth or industrialization -- and their geographic isolation from urban areas suggests they may not -- it is important to note that population decline apparently has tended to keep pace with the reduction in job opportunities. This implies that some rough degree of equilibrium has been

struck. The population remaining behind apparently has been able to support schools and other community facilities which, while slimmed-down, still are of sufficient quality to prepare those who must someday depart for other regions to find jobs -- and still provide a satisfactory level of public services for those who stay.

At least as compared with the category of counties that will be discussed next, the public services and educational systems in these areas probably have not deteriorated to the point at which they are either inadequate to their purpose or incapable of being supported at an effective level by local taxpayers. If this apparent equilibrium between community resources and jobs on the one hand and resident population on the other, can be maintained, and if public facilities can be updated, then these rural areas probably will remain attractive places in which to live. To the extent that these rural counties are also able to remain effectively integrated into the agricultural sector of the economy that they serve, they are likely to manifest a degree of stability and independence that certainly is among the underlying objectives of rural development.

Role of broadband communications (modest change counties). In many respects, the kind of broadband communications system that would be appropriate to these "modest change" counties would be quite similar to that described in the previous discussion of Turnaround Reversal counties.

Like Turnaround Reversal counties, these counties apparently possess school systems and other community services that are functioning effectively and that presumably are in a position to benefit from the kind of incremental qualitative improvements that the addition of broadband services alone might

bring. Unlike the next category of declining counties to be discussed, there are not likely to be more basic and higher priority needs to be first addressed, such as replacing decrepit school buildings to house children or finding the necessary funds to hire competent teachers. In other words, if Hansen and others are correct in their description of the viability of this category of declining counties, upgrading of community services need not first require a basic rebuilding of facilities, and improvements are more likely to be capable of being initiated without massive outside assistance and financing. Further, these counties seem likely to have retained that sense of community involvement and tradition of working together which makes it more likely that they could on their own initiate and carry through to fruition local broadband communications projects.

The kind of broadband system appropriate to the "equilibria" counties being discussed in this section thus might be public services oriented and capable of being underwritten in part by the school systems and local governments that would share in their use. Until population decline levels off and these counties long-range economic prospects become reasonable clears, however, it seems likely that the incentive for business and commercial use of these systems would remain limited, except in those very active agriculture areas where such enterprises as grain elevators, commodity trading firms, and livestock auctions might lease system time.

Alternative course of development (major change counties). This category of declining rural counties represents those areas where need is the greatest in every category of community service. In these areas, there is not a balance between the community's resources and the needs of those who have remained. While tax revenues and resources of every kind have tended

to shrink, the need for them has not, and major deterioration of these communities has been the result.

Recognition of the severity of such problems in rural areas and the approach taken by Congress in helping to resolve these problems were described as follows by Senator Humphrey in 1973:

"We know that the highest rates of unemployment in America were in the countryside. We know that two-thirds of all the substandard housing and half of the poverty were out there in rural America. We also learned that these people were not receiving a fair share of the assistance provided by the Federal Government.

What we hoped to do through the Rural Development Act was to provide economic opportunity -- jobs.

But we know that before industries and business can spring *up in small towns there has to be a certain infrastructure -- a broad combination* of community facilities that all add up to improving the general quality of life so that money will flow in and people will stop moving out" (22-12). (Italics added)

By themselves? of course, improved community facilities are not likely to be of sufficient weight to influence a firm to locate its plant in a given rural area. In a USDA-funded study of 39 selected branch plants established in rural areas of the Upper Great Lakes in the 1960's, location of raw materials, major markets, and relative distance to headquarters and other branches were described to be of greatest importance in determining general location of new plants.

Once general location of a new plant was determined, however, the individual attributes of different areas did come into play. First in order of attributed importance in the USDA-funded survey was the availability of trainable labor:

"Officials of 24 companies discussed labor, most emphasizing that a community must demonstrate that it has an adequate supply of trainable labor in the area, otherwise it has little chance of getting a branch plant ...Four firms were strongly influenced in their decisions by the presence of vocational schools where the needed skills were being taught, or training programs were being provided" (23-2).

An official of the Corning Glass Corporation, which decided in the 1960's to locate most new plants in communities of 10,000-20,000 in population, put the matter even more strongly:

"As you can imagine, the specifications for the manufacturing of today's products continue to get tighter and tighter. This seems to be the case whether you are making toys or computers. Also, the technology to produce many of today's items means that a work force that is hired to man today's plants must be able to offer his prospective employer either a greater degree of educational background or a greater capability of being trained than has been the case of his predecessor. We, in our business, are no exception to this situation. Personnel from our search teams will, in nearly all cases, talk to employers in a community and raise the question of the trainability of the people available in the area" (24-7).

Although the Corning Glass official cited a broad range of community facilities as being important in site selection, it is interesting to note that the 39 companies interviewed in the USDA-funded project seemed to give little weight to, or ignore, many categories of community services:

"Local police and fire protection seemed to be taken for granted by companies moving into non-metropolitan communities.

Very few company executives mentioned medical, dental, and hospital services as influencing branch location decisions.

Only when the establishment of the new plant required the relocation of a number of supervisory personnel or skilled workers were company officials influenced by the availability and quality of schools, churches, social and recreational activities" (23-3/4).

Taken at their face value, these comments seem to indicate that a rural community can get by with very little in the way of community facilities and still successfully compete for new industry. However, when it is realized that an educated, trainable labor force implies the existence of a functioning community, then the quality of the full range of community facilities takes on a greater significance.

In the same connection, with only a few exceptions, the 39 corporations interviewed in the USDA study stated that the successful communities had sought them out, and all successful communities were found to have an active Chamber of Commerce or industrial development group:

"The real selling job was done in a face-to-face presentation by an action committee of the Chamber of Commerce or by the industrial development corporation. They usually presented community statistics and pertinent information applicable to the particular prospect, probably a profile of the industrial park, and photographs of what the community had to offer" (23-9).

Suffice to say, moribund rural areas, or those with little more than a labor supply, are not likely to produce this kind of active community involvement or initiative. Finally, it is important to note that plant location usually is a competitive process among many communities. Whether a community with serious deficiencies in the availability of medical services, shipping facilities, school system, or fire and police protection, can win out is at least open to doubt. That corporations, in the words of the Corning Glass official, consider site selection to be a competitive process seems clear:

"In the end, all the parts of the industrial development effort must add up to make a given community the most desirable when measured against other like communities due to the competition for new plants -- and there will be competition" (24-13).

Role of broadband communications (major change counties). In the case of declining rural counties, the feasibility of broadband systems is likely to be dependent upon the basic decision that is made by federal and state government concerning the rebuilding of community facilities, including the schools and health services. If a commitment is made to improve the quality of these services in a major way, then it is possible to visualize how the related broadband services described in Chapter 11 might play a useful and cost-effective role in their delivery. In this instance, should the benefits of broadband so warrant, some of the funds provided for the major rebuilding programs could be used to help underwrite the cost of the broadband system.

If such a commitment is not forthcoming, however, the outlook for feasibility is poor. Unlike the growth areas discussed earlier, community facilities in these counties are likely to have deteriorated to the point at which the provision of the most basic services is in jeopardy. Caught between shrinking tax revenues and an increased demand for assistance from the elderly and the unemployable, these communities are unlikely to be able to spend scarce tax dollars on the improvements that broadband services might provide when, at the same time, they are struggling to maintain the most minimal basic level of health, education, and other community services.

If, as will be discussed in Chapter IV, the economic feasibility of rural broadband systems depends upon the fullest possible use of community services as a revenue source, then it follows that the systems themselves are not likely to be feasible until (1) the communities on their own somehow become economically revitalized or (2) direct government subsidies are made available for major community service rebuilding programs (and related broadband delivery services).

In the laissez-faire alternative, broadband systems are likely to come along, if at all, only when a rural area has somehow brought its resources and population into balance along the lines of Hansen's Great Plains example or until it has moved up the ladder of industrial diversification as have many counties in the South.

When and if one of these stages have been reached, broadband communications, as discussed in the cases of Turnaround Acceleration and Turnaround Reversal counties, could perhaps assist in the growth and preservation of service industries and they could improve the quality of community facilities so as to attract such people as retirees. But in this instance the development of broadband systems still would have to await the economic evolution of the areas in question; broadband systems, in and of themselves, would not have been an active agent of change.

In the second alternative of direct subsidies and other assistance to upgrade community facilities, it is difficult to visualize a realistic source of funds except that of federal and state government. If this is the case, then the value as well as the feasibility of broadband systems is likely to be dependent upon the extent to which they mesh with and contribute to the objectives of such federal and state assistance programs. In turn, concerning those objectives that the broadband services must mesh with, it is necessary to consider the future course of rural development policy generally.

As an example, should funds be simply allocated so as to preserve existing community facilities in all areas at some minimum maintenance level, then

it is unlikely, for the reasons outlined above, that any will be able to support the costs of broadband systems.

On the other hand, if governmental policy decisions are made to focus resources in a more selective manner which would create growth centers, for example, then it is somewhat easier to visualize how broadband communications systems could make an active, and perhaps significant, contribution.

One of the features of the growth center approach is that it attempts to work with, rather than against, the economic forces that determine the viability of a rural community. The Council for Agricultural Science and Technology offered the following observations in this regard:

"Some communities do not have the critical labor supply, transportation, and opportunities for low-cost provision of adequate services necessary to sustain growth. They will require outmigration or commuting to work in other communities. A rural development program cannot be expected to save every rural community in trouble. . .Resources for planning and implementation of programs may be employed most effectively if they are concentrated in those areas where the need is greatest and where population, trading, commuting, and infrastructure patterns provide a critical scale of labor and other services needed to alleviate problems and constitute a viable economic entity. . .

Voicing a similar view on the revitalization of rural areas, an official of the Economic Development Administration has suggested that Federal efforts be focused on developing at least one viable center in each state "development district". In so doing, a functional test was proposed in which relative economic advantage, such as key transportation, trade and service links to surrounding areas, would be given strong weight (26-61).

Taking this functional approach a step further in a study of historical growth patterns in the United States, Hugh Denney found that areas approximately 64 miles in radius seem to be evolving as prime regional centers. Applying this discovery to the state of Missouri, Denney found such centers not only to be major trading centers but also increasingly central locations for television broadcasting, junior college and higher education, as well as medical facilities (27-27).

Relating this concept to the way in which governmental resources might be allocated, Denney suggests that 64-mile radius centers be a focal point for action:

"A national policy to raise the levels of transportation, communications, health, and education on the (64-mile radius) spatial pattern would bring all parts of this country within one hour of such services and create a healthier environment for industrial dispersion" (27-107).

Specifically, Denney identified 296 such centers in the United States which are below the national average in the ratio of community service employees to population:

"It is in these communities that special efforts are needed to improve services whenever the population based will support them...

Most centers on (this) scale are devoting their energies to securing industries; a commendable cause, but they are often giving inadequate attention to making their communities good service centers for the population they now have. Most industries are looking for towns that have a high level of services, thus these communities would do well to raise their levels of service while continuing to work for improved industrial jobs" (27-116).

While Denney's 64-mile radius growth centers are to be found in all areas of the country, his theory offers one possible rationale for locating government offices and allocating developmental efforts in declining rural

areas. It is of further and special interest that potential regional growth centers of this size might represent good market sizes for broadband communications: in 1968, 243 of 352 64-mile radius centers were found to be served by cable television (27-56).

To briefly sum up this discussion of the role of broadband communications in furthering the development of declining rural areas, it can be seen that the outlook for such systems is decidedly uncertain and dependent upon the future course of government policy on rural development. Unlike the situation in the growth counties considered earlier, broadband systems in these counties cannot simply be incorporated into, or underwritten by, existing community services. Although any or all of the public broadband services described in Chapter 11 could be of substantial value in declining counties, their feasibility will depend upon the 'how, where, and how much' of federal and state assistance efforts.

Should this investment be sufficient to result in a major improvement in community services, broadband systems conceivably could be used to extend health, education, and other governmental services to the majority of the rural populations involved. In turn, revenue from the sponsoring government agencies might make a critical difference in helping to underwrite the broadband systems themselves. If not, then the most hard-pressed of the declining rural counties will probably have to await that uncertain day when growth creates sufficient economic prosperity so as to enable the establishment of strictly locally-supported and financed broadband systems.

Summary And Discussion of Findings

In approaching the task of examining the contribution broadband communications can make to rural development, it first was necessary to examine the present nature of change in rural America.

The 1970's has seen a reversal of the historic migration of Americans from rural to urban areas, with a net 1.6 million persons moving from urban to rural areas. In this period, overall rural growth (5.6%) exceeded that in urban areas (4%). This growth was not distributed evenly among all rural areas, nor was it found to be explainable simply in terms of proximity to metropolitan areas: the largest quantitative increase in net immigration occurred in counties adjacent to metropolitan areas, but the sharpest turnaround in migration developed in the more distant rural counties.

This change, whatever else it might have done, has not altered the sizable differences that exist among rural areas. parallel with the finding that there is no simple way to describe rural America is this study's proposition that broadband communications systems will succeed or fail to the degree that their characteristics match the particular needs and economic conditions of each rural area in which they are located.

In trying to make sense of the great diversity of needs and conditions in rural America, this study first identified the major forces underlying present change and then projected the future course of development and indicated needs that are likely to emerge as a result of these forces.

The three principal forces identified in this study were:

- decentralization of manufacturing
- decentralization of the service sector of the economy
- residential preference

Decentralization of the service sector of the economy and of manufacturing were found to be roughly descriptive of development, respectively, in two major categories of growing rural counties: "Turnaround Acceleration" (generally adjacent to metro areas) and "Turnaround Reversal" (generally not adjacent to metro areas). A third major factor -- residential preference -- was found to be important in both. In the following summary of the points that were made concerning these two categories of growing counties (plus, for completeness, a third category of counties that are declining), future needs are related to the contribution that broadband systems might make.

Turnaround Acceleration Counties

This group of counties grew rapidly in the 1960's after having gained some population in 1950's. As a class, they are distinguished by their proximity to metropolitan areas and their relative growth in the service sector of the economy.

Two of the problems those counties might encounter in the future are:

- an overload on existing community facilities. 473 counties grew by 10 percent or more between 1970-74, with some achieving an annual growth rate of 22.5 percent or more; the fastest growing were also characterized by an influx of new residents and a higher proportion of families of child-rearing age.

● effects of fuel shortages upon automobile use. Many of the fastest growing counties are in hybrid urban-rural areas that have evolved as a result of extensive long-distance commuting (up to two-hour radii of travel). High gasoline prices or rationing could have a catastrophic effect upon continued growth in these counties.

A third problem this category of counties -- especially those located in those sprawling hybrids called "urban fields" -- might encounter in the future is uneven development and uneven sharing in the fruits of growth. It was suggested that the 'leap-frogging' expansion process entailed in the development of urban fields could leave isolated backwaters in which "all slum municipalities" might become the successor to what were, in the superseded small rural communities, all-slum blocks or neighborhoods. Concerning the dominant growth activity in these counties -- which was found to be in the non-goods producing, service sector of the economy -- the prospect was offered of the centralization of such enterprises at a few key locations along Interstate Highways and other high-speed arteries.

As an alternative to this very extensive, scattershot kind of regionalization, a smaller scale variant was discussed in which development might be more evenly dispersed throughout the rural areas. In this alternative, the rural region might "emulate" the extensive regionalization of the larger urban field before the latter becomes firmly established.

In this regard, one of the contributions broadband communications might make would be to enable such "emulation" by substituting communications for that of travel by car. Specifically concerning the decentralization of

service activities, there is recent evidence of the key role played by communications in making possible the decentralization of corporate headquarters. In addition, it has been shown that communications has enabled the decentralization of precisely the kind of service activities that have been found to dominate the development of urban fields. Because distance is no barrier to communications once links are in place, broadband systems might enable greater dispersal of service industries throughout a growing rural region as has occurred between city and distant suburbs in the New York metropolitan region. At the very least, the existence of broadband systems in a rural area would mean that the ability of that area to share in the subsequent development of the larger region would not be foreclosed.

As will be discussed in Chapter IV, broadband systems offering the entertainment and public services described in Chapter 11 could be economically feasible and could be established while an area was still predominantly rural in character. Once in place, however, the system could be subsequently expanded to provide those commercial broadband services that could enable the more dispersed decentralization of economic activities suggested above.

Turnaround Reversal Counties

The dominant economic force in this category of counties is increase in manufacturing employment. Unlike the faster-growing Turnaround Acceleration group, counties in this category tend not to be located in close proximity to metropolitan areas. As the term implies, "Turnaround Reversal" are counties in transition, having emerged in the 1960's from a lengthy period of decline.

For the present, the effect of the growth of manufacturing in this category of counties probably has been beneficial to the inhabitants involved:

- while some net outmigration is still occurring in some of these counties, the major exodus and attendant dislocation of earlier days has been arrested.
- new jobs have been created, but characteristically there has tended not to have been a large influx of new residents which might over-burden existing community facilities.
- even if new manufacturing jobs have been created by the establishment of slow-growth, low technology industry (as discussed earlier, actual samplings show this not necessarily to be the case in rural areas), there are numerous examples, especially in the South, where low technology industry has been succeeded by progressively more growth-generating kinds of enterprises.

In these counties, it is the long-term economic outlook that could be of the greatest concern: i.e., their ability to share in the growth of the service sector that is coming to dominate our national economy. The operative question is whether they can preserve their relative share of the nation's material goods while still relying for employment upon that diminishing sector of the economy which is manufacturing in this country.

Studies of rural industrialization have shown that growth in the service sector does not necessarily accompany or follow an increase in manufacturing employment. In fact, it was found that in the 1960's manufacturing-induced growth frequently ran counter to growth in the service sector. Concerning rural small towns, generally business activities have tended to decline and become progressively centered in larger communities.

While broadband systems by themselves are not likely to be a factor stimulating decentralization and growth in the service sector in the manner in which they might in the case of Turnaround Acceleration counties, some capability for service sector usage will be available in any two-way broadband system that might be established. Although the feasibility of systems in these Turnaround Reversal counties will be primarily dependent upon their usage for entertainment and public services, the population of these counties should be in a good position to be able to afford the latter. They are not as likely to have had an increase in tax revenues resulting from new industries counterbalanced by increased demands for services generated by an influx of new residents. Thus, it might be likely that some portion of system cost could be underwritten by public services users such as the school system. Additionally, disposable income in these growing counties is likely to be sufficiently high that many individual subscribers could afford to pay for hook-up to the system.

Provided that broadband systems can be justified on the above grounds (a matter dealt with in greater detail in Chapter IV), the additional availability of the system for broadband commercial services could serve the purpose of:

- helping to forestall the further erosion of the existing service sector in these counties.

- providing the communities involved with the communications infrastructure necessary for the growth of the service sector, when the latter occurs.

Declining Counties

Although the number of rural counties losing population decreased by more than half in the early 1970's, 25 percent of all rural counties in the United States still remain in this category.

As a class, these counties are those in which gains in manufacturing and service employment have not counterbalanced losses in agriculture and mining jobs. In these counties, the departure of working age residents has led to a steep increase in the proportion of the elderly and the young. The need for public services, such as those described in Chapter II, has tended to escalate as tax revenues have shrunk.

For the most seriously affected of these counties, it is open to serious question whether broadband systems would be feasible unless subsidized in their public service applications by federal or state government. This is likely to be so, as will be discussed in Chapter IV, because the financial viability of these systems in large part will depend upon community services, such as the schools, an important source of revenue. If the communities in question are hard-pressed, it is unlikely they will be able to spend scarce dollars on the improvements that broadband services might bring while at the same time they still might be struggling to maintain the most minimal basic level of health, education, and other community services. On the other hand, should a federal or state decision be made to improve these community services in a major way, then their delivery by broadband might be a cost-effective method and might warrant federal or state sharing in their costs.

In the category of declining rural counties, therefore, the feasibility of broadband systems is likely to be heavily dependent upon the timing and nature of the revitalization of community services:

- if a rural community is largely left to its own devices, the establishment of a broadband system is likely to await its 'evolution' to a condition of economic growth.

- alternatively, if substantial outmigration can occur before community services deteriorate to the point of no return, and if a community's resources and population remain in some sort of balance, then it is possible to visualize the feasibility -- without substantial outside assistance -- of a broadband system. Such 'equilibrium' rural communities (roughly equivalent to the Turnaround Reversal category discussed earlier) exist today in the Great Plains region.

The other alternative is direct subsidies and other assistance to upgrade community facilities, in which case it is difficult to visualize any realistic source of funds other than that of federal and state government. In this instance, the feasibility and value of broadband systems is likely to be further dependent upon the extent to which they mesh with and contribute to the objectives of the government assistance programs.

For purposes of discussion -- and to lend some specificity to the "iffy" role of broadband systems in contributing to rural development programs in declining counties-- the example was considered of the so-called "64 mile radius"

regional centers that presently are evolving in this country, and that have been offered by one scholar as focal points for organizing government assistance. Briefly, these centers were found to be the location of major trading enterprises, junior colleges, medical facilities, and television broadcasting for the surrounding areas. Of further interest, growth centers of this size have apparently represented viable markets for broadband communications: in 1968, 243 of the 352 64-mile radius centers studies were found to be served by cable television.

Unless overall development efforts have some coherent and realistic purpose, it does not seem that a broadband communications system will make little difference to a declining rural area, even if entirely subsidized from outside sources. As every rural hamlet cannot be the site of a general hospital and a 4-year college -- which implies the necessity for devising some sort of regional system for the delivery of such services -- so, too, is it unlikely that each crossroads can be the center of its own broadband system. To the degree that a larger rural area (the 64-mile radius area is only one example) serves as a basis for coordinating the delivery of medical, educational, or other community services to a region's inhabitants, broadband communications potentially could serve as a substitute for extensive individual travel in realizing the benefit of these services and helping to make the most of available resources.

summary Observations

- Any area-coverage rural broadband system will require the fullest development of every possible service (entertainment, public, as well as commercial) as sources of revenue. Leaving aside entertainment service as a common denominator in all systems, the

principal additional sources of revenue will vary according to the type of rural area:

1) in the fastest growing rural counties (those dominated by growth in the service sector of the economy), business and commercial broadband services are likely to offer the greatest potential source for revenue.

2) in growing rural counties characterized by growth in manufacturing employment, public service uses are likely to represent the best additional source for revenue.

●Broadband systems in growing rural counties could:

1) enable greater dispersal of service-type industries than is presently the case in some of the fastest growing counties. This could permit more equal sharing in the fruits of growth by all sections of a county and make more likely the continued viability of smaller rural communities.

2) help forestall continuing erosion of business functions in those small towns located in areas of manufacturing growth, and provide the communications network necessary for later growth in the service sector, should economic conditions permit.

●Broadband systems in declining rural counties could:

- 1) contribute to the cost-effective functioning of federal and state programs designed to upgrade medical, educational and other community services.
- 2) help to attract new industries by serving as a vehicle for delivery of upgraded community services.

●Implications for government policy are:¹

- 1) in growing rural counties, broadband systems have the potential for becoming self-supporting; assistance required is likely to be in the areas of technical assistance and securing of financing.
- 2) in declining rural counties, the economic base is likely to be inadequate to support broadband systems. However, to the extent that government subsidies might be made available to upgrade schools and other community facilities, some functions might be performed through the use of broadband and appropriate reimbursement made to the system. The latter revenues, in turn, might be sufficient to make the system financially self-sustaining. The value of broadband systems

¹ Because most statistical data is available on a county basis, the single rural county has been used as the unit of analysis in this discussion. This is not meant to imply that the individual county must be used as a Planning basis for government policies affecting the establishment of rural broadband systems. Indeed, in their full-service uses contemplated in this study, rural broadband systems are more likely to be coterminous with the boundaries of school districts and the like, which increasingly are multi-county or sub-regional in nature. For further discussion on this point, see Chapter IV.

in providing public services is likely to depend upon the extent to which these services mesh with and contribute to these government assistance programs, as well as upon the degree to which rural development policy emphasizes area-wide, coordinated delivery of community services.

- Despite the evident promise of broadband communications systems, there can be no assurance that they will in fact evolve in the manner suggested in this Chapter. Before entrepreneurs, local business leaders, or governmental officials can seriously entertain organizing and deploying such systems, much more has to be known about the practical aspects of their financing and operation. This will be the subject of the next and final chapter.

CHAPTER III

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