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# Telecommunications and its Practical Application, Athol, Massachusetts

Center for Economic Development

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**TELECOMMUNICATIONS AND ITS  
PRACTICAL APPLICATION,  
ATHOL, MASSACHUSETTS**

**Center for Economic Development**

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Industrial Planning  
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## **Part I        Background to Telecommunication Technologies and Their Relation to Rural Areas**

### **1.0    Introduction**

Rural areas have been experiencing a transition in their economic and social structure. Traditional industries such as agriculture, manufacturing, and resource extraction have been declining. The result has been a displacement of labor in rural areas and instability within rural economies. Upwards of three quarters of rural counties have experienced outmigration in the last decade (Hines 1997, 8). Per capita income in rural areas is only two-thirds that of their urban counterparts, and rural poverty rates exceed those in urban areas (ibid.) Rural areas have traditionally considering how the quality of their education, health, and government services can be incorporated into their overall development plans. Since the 1980s, however, another factor has become increasingly important; telecommunications technology and its applications.

Telecommunications technology has grown to include interactive voice, data, video connections, personal computers, modems, and the internet. These technologies are increasingly important in a society which is more information dependent. With the onset of the information age telecommunications has taken on an important role in the competitive advantage of almost all sectors in society; manufacturing, education, health care, and government. In the area of industrial and economic development understanding how the information age impacts businesses is very important for successful planning.

### **2.0    Economic Development**

Information related businesses are often thought of as the most dependent on information technology. These might include areas such as finance, research and development, law, and high technology manufacturing; biotechnology. Traditional industries that provide non-information services are also becoming increasingly information

dependent. Information technology provides these industries with new and more effective ways of managing operations, retaining and contacting prospective customers and suppliers, and expanding their market base. Telecommunications provide industry with the means to improve efficiency, allowing for quicker response to consumer and market demands. They also help businesses in record keeping, accounting and job placement (Hines 1997, 18). Since urban areas have traditionally been the centers of information resources they have held an advantage over rural areas when it came to providing information. With advances in telecommunications capabilities, however, rural areas are able to challenge this paradigm.

The primary disadvantages facing rural areas are geographic isolation, smaller/less skilled labor pool, inefficiency, and dependence on core industries. Telecommunications provide rural areas with an opportunity to overcome these barriers.

## **2.1 Geographic Isolation**

Rural areas are at a disadvantage when it comes to economic development. They are often located away from major transportation corridors and do not have access to the business services available in urban areas. More importantly, however, is that the geographic isolation of rural areas mean that industry can not easily access potential markets and suppliers. This “distance factor” adds costs to manufacturing and customer services. Urban areas do not face the same challenges and have a distinct competitive advantage. Telecommunications provide an opportunity for rural areas to overcome some of these disadvantages.

Telecommunications can reduce many of the distance related costs of economic activity. Industry can use telecommunications to acquire the services normally reserved to urban areas. They can also provide access to markets that would normally be cost

prohibitive for a rural industry to invest in. Because advances in telecommunications are an international phenomenon, rural economies have instant access to global markets which they can communicate with and share information. Rural economies can also use telecommunications to keep up with market demands in real time, without having to wait for the information to reach them. Also traditional industries such as agriculture can benefit from telecommunications and provide them with the resources necessary to revitalize their production and competitiveness. Telecommunications also provides industry with access to a larger labor pool.

## **2.2 Labor Pool**

As was previously mentioned, rural areas are experiencing an outmigration of their labor pool. As individuals leave for suburban and urban areas to find higher paying jobs, industry has a smaller more dispersed labor pool to draw on. Telecommunications can provide centralized data banks of job hunters which could be accessed to locate individuals with the skills and experience a potential employer is looking for.

Mark Hess, a graduate student at the University of Massachusetts, Amherst, Department of Landscape Architecture and Regional Planning, is currently doing research into a job bank which would serve to connect business, education and job hunters so that each can know what the needs of the other are (Hess 1997). Projects such as this will be increasingly important to rural industries who are seeking skilled employees, as well as informing the labor pool of the skills they will need to obtain employment.

Telecommunications technology also provides for increased efficiency in industry.

## **2.3 Increased Efficiency**

Rural industry is at a disadvantage when it comes to reacting to changes in market demands as well as their internal operations. While industries in urban areas have easy

access to governmental services, market information and support services, rural industry does not. This disadvantage, however, is being mitigated by electronic access to these areas. Industry can now access these services electronically. Internal operations are more efficient because of the automation of such activities as payroll, taxes, materials management and production lines. These internal aspects of the manufacturing process can now be updated in real time to changes in the market. This improved efficiency also helps to mitigate some of the transportation costs which rural industry must deal with. With the traditional disadvantages that face rural areas being ameliorated by telecommunications technology, an opportunity for economic diversification is also created.

#### **2.4 Economic Diversity**

Rural economies have often been dependent on core industries. In New England a decline in manufacturing has led many communities into economic crisis. This vulnerability to economic cycles is just one impetus behind the outmigration of much of the rural population as they seek more stable job markets. By removing many of the barriers associated with rural areas, economies can become more diversified. A rural area can use telecommunications to support a variety of industries all of which benefit from its application. Telecommunications also helps rural industries to develop and maintain long distance partnerships, which in turn can provide increased security against economic downturns. Telecommunications also provide employers and employees opportunities to implement telecommuting programs.

#### **2.5 Telecommuting**

Telecommuting refers to office based employees using telecommunications to work at their homes or a nearby alternative office for a few days each week instead of commuting a longer distance to work (Niles 1994). Studies of telecommuting in California and Washington State have found that telecommuting produces an overall net reduction in all



household driving, a net energy benefit and an improvement in worker production (Niles 1994). There are four major motivating factors for companies and communities to advocate for increased telecommuting. These include 1) community desire to reduce trips reducing air pollution, 2) corporate desire to improve productivity and the economics of labor by reducing stress and economics of commuting, 3) personal desire to regain control over stress and time, and 4) rapid proliferation and acceptance of electronic communications in the business community (Quay 1995). Because of the success experienced with telecommuting, estimates of the growth in telecommuters vary from 10% to 30% a year, including upwards of 5% of the labor force (ibid.). This growth rate is five times larger than the growth in jobs. The benefits to employers and employees are not superficial.

### **2.5.1 Benefits to Employers**

Because telecommuters work at home for a good proportion of their work week companies can net large savings in capital investments; office space, supplies, and parking facilities. **Appendix I** provides a cost benefit analysis for companies considering telecommuting. Studies done by JALA International, a telecommuting consulting firm, have also shown that the productivity of workers who telecommute average between five and twenty percent higher than their non-telecommuting colleagues ( Niles 1997).

One of the concerns expressed over the use of telecommuting is that teamwork will suffer. The use of teams in corporations has been gaining acceptance for the past couple of decades in response to an increasingly complex business environment. This concern, however, has not proven to be true.

Most teams go through a regular series of group meetings as they work on their project. During the intermittent time between these meetings, however, each team member is usually working on a specific aspect of the project. These individual tasks can be done

more efficiently using telecommuting and scheduling meeting times less frequently. Also there is now the possibility that video conferencing can replace physical meetings. An example of how this approach to telecommuting can work is close at hand.

During the previous semester the author participated in a studio project with three other team members. The team met frequently to allocate assignments and then each team member did their assignment independently of the others. The team, however, used telecommunications technology, e.g. e-mail and electronic transfer of documents, to allow team members to work independently yet share their work almost instantaneously with other team members. The group was able to stay on task and still be informed of what other teammates were doing. This improved efficiency resulted in less physical interaction, which was usually not as efficient because of the interpersonal dynamics of the group. The group also used access to the internet in their research. The use of telecommunications technology increased the efficiency of the team without impacting the quality of the work produced.

Other benefits to employers include less sick leave and increased loyalty to the company, resulting in reduced turnover rates by twenty percent or more (ibid.). These benefits not only extend to employers but to employees.

### **2.5.2 Benefits to Employees**

Employees benefit by having reduced commute times. This often leads to less stress and decreased travel times which can be used more productively. Working heads of household also have more flexibility in managing their time so that they can participate more in their family life. Telecommuters also have more flexibility in choosing their place of residence. Proximity to work no longer becomes as much of a determinant in choosing where to live. If telecommuters commute to work only a couple of days a week travel time

becomes less of a consideration. Families can choose their place of residence based on factors including quality of schools, cost of living and other personal preferences. These advantages can lead to an improved sense of quality of life for the employee. They also provide a unique opportunity for rural renewal.

### **2.5.3 Rural Renewal and Telecommuting**

With decisions about location of work and home more independent, people who prefer the benefits of rural life, e.g. reduced crime, quieter surroundings and proximity to open space, can choose to migrate to those areas. Between 1980 and 1990 there was an outmigration from rural areas to urban areas of 3.7 million people. If 20 % of potential rural commuters chose to move to rural areas this could represent a potential 4 million people, reversing the loss from rural communities (Quay 1995). Telecommunications is not limited to improving economic opportunities for rural areas. Information technology also provides for increased educational opportunities.

### **3.0 Educational Opportunities**

Rural areas are faced with challenges which make providing education more difficult than it is for suburban or urban areas. The tax base in many rural areas is not as diverse as in suburban and urban areas. This means that the resources available to rural areas are limited. Telecommunications provide an opportunity for these rural areas to benefit from areas with more resources.

Through distance learning techniques such as interactive video, video courses and correspondence courses, educational opportunities are opening up for rural areas. Curricula which might otherwise be cost prohibitive due to salary demands can be offered through the variety of mediums mentioned above. This also benefits the economic sector by providing opportunities for worker training and certification, enhancing labor force skills.

John Mullin reflected on his experience with distance learning when he participated in a video conference in Vermont. His experience was very positive and alluded to the ability of using telecommunications to reach a large audience dispersed over a large geographic area simultaneously (Mullin 1997). Because of the geographic limitations placed on rural areas the educational opportunities which telecommunications offer are an obvious benefit. In many same ways that telecommunications benefit education in rural areas, health care in rural areas can also benefit from telecommunications technology.

#### 4.0 Opportunities for Health Care

Levels of health care in rural areas have historically been below those of their urban and suburban counterparts. Again, geographic isolation and lack of access to expert health care providers is a major cause of this dilemma. Primary health care, or preventive medicine, is an inexpensive way of fostering improved levels of health in rural areas. This approach is very information dependent. Health care providers must be able to disseminate information to large sectors of the population to educate them on basic lifestyle changes, dietary information, and support services available to rural clients. Telecommunications provide a unique medium for accessing large groups of people and providing them with the necessary information.

Besides advocating for primary health care, telecommunications also allows rural areas to have increased access to medical expertise. Through the use of telecommunications technology, health care providers can provide remote diagnostic services and support from specially trained physicians, who are often located in more prosperous suburban and urban areas. By using telecommunications to advance primary and curative medical access in rural areas, studies have suggested annual savings of between \$36 to \$100 billion (Civille 1993). The benefits of using telecommunications to promote health care in rural areas is efficient and may provide for significant cost savings.

## 5.0 Government

Telecommunications and information technologies can also help to promote responsive government in rural areas. Government agencies have taken advantage of many of the benefits offered through computer technology. Computer systems simplify record keeping, tax collection, voter registration, automobile registration and licensing, and law enforcement. Telecommunications help to extend these benefits over larger regions, connecting computer systems together to permit communication between various government agencies. This can prevent duplication, increase efficiency, and prevent fraud.

In Texas, welfare providers have replaced traditional food stamps with what is known as the "Lone Star Card". This is similar in function to a credit card and facilitates the monitoring of each card issued. This has greatly reduced the fraud which has plagued food stamp programs; when people trade in their food stamps for cash with merchants, in exchange for the merchants receiving a "cut".

Government sponsored bulletin boards and kiosks have also helped to promote tourism and public discourse. With public apathy becoming a problem across the nation, telecommunications offer another avenue for public debate and dissemination of important information. This discourse also helps government be more responsive to constituent needs by monitoring dialogue and responding to administrative questions in a more timely manner. One of the ways that communities are taking advantage of telecommunications technology is through the development of community networks.

## 6.0 Community Networks

“A community network is a network of computers and modems that are interconnected via telephone lines to a central computer. The system provides local information and a means for community residents to communicate electronically.”

(Beamish 1995) The purpose of community networks vary. They are most often used to build community awareness, encourage involvement in local decision making, develop economic opportunity and to provide “one stop shopping” for citizens interested in government services (Schuler 1994).

Community networks are distinguished by their focus on local issues. Accessibility is usually provided in publicly accessible place such as libraries, municipal offices and other community centers. They are also accessible by modem from a home computer. The ease of access is meant to promote the public's use of networks and make them as participatory as is possible with given resources.

Part two of this report will introduce how the Millers River Community Development Corporation (MRCDC) plans to implement the Millers River Community Network (MRCN) within the Millers River region, and the goals they hope to achieve with it. The MRCDC is also looking at using telecommunications technology to establish TeleWorks centers for microenterprises and individuals.