

INTERNET SERVICE PROVIDERS IN RURAL TEXAS: REBELS WITH A CAUSE

Becky Lentz, Doctoral Student

Dept. of Radio-TV-Film at the University of Texas at Austin

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INTRODUCTION

The deregulation of U.S. telecommunications industries in 1996 exacerbated whatever economic disincentives already existed for local telephone companies to serve rural areas with advanced telephony services, especially Internet access. Now that telecommunications expansion is more market-driven, low population densities tend not to attract advanced infrastructure investments from traditional telecommunications providers. Given this deregulatory environment, this study explores the special role that rural Internet service providers (ISPs) might play in facilitating aspects of community and economic development in some parts of rural Texas. Impetus for this research came from the recognition that little work had been done that examined the unique role that commercially-based Internet service providers might play in rural community and economic development efforts and initiatives. Texas offers an interesting site for this investigation because it is the second largest rural state in the country and because it is experiencing many rural connectivity challenges because of large travel distances and sparse populations in many areas. In addition, state policymakers have targeted the telecommunications infrastructure as a critical component of a statewide initiative to develop the information services sector as an area of economic growth. Specific research questions include 1) what is the local impact of Internet "connectivity" to individuals and to businesses in rural areas, 2) in what ways do rural ISPs support the development and sustainability of rural communities, and 3) what, if any, economic, regulatory, or competitive barriers do rural ISPs face?

BACKGROUND

The National Infrastructure Initiative

Extensive growth of the Internet over the past five years suggests a need to examine the role of Internet Service Providers (ISPs) in the development of the rural segments of the National Information Infrastructure (NII) which was announced by the Clinton Administration in October 1993. The Internet is probably the most important component of the NII because it provides the backbone connectivity upon which much of the NII depends. According to one expert, the NII "ranks with the space race as a major technology-centered policy initiative" (Kahin and Keller, 1995, p. 3). With the NII, the Administration "...seeks to ensure that all Americans can take advantage of the opportunities brought by advanced information technologies and service...[it] will spur economic growth and create jobs for Americans...[and] is helping to prepare our children for the knowledge-based economy of the 21st century" (Office of the President, 1994, p. 1). In another government publication, NII objectives were stated in an equally ambitious way:

"The Administration's vision is of a ubiquitous network of networks that will help America to prepare its children for the workplace of the twenty-first century, allow all Americans to continue their education and upgrade their skills throughout their lifetimes, extend lifesaving medical care to remote rural areas and promote healthy communities, and make America's businesses the most competitive in the world. The President has challenged the nation to connect all of its schools, libraries, and hospitals to the information superhighway by the year 2000" (US Dept. of Commerce, 1996, Letter from Michael Kantor).

Further, according to a legal expert focusing on other components besides information and computing technology, the NII also includes

"...conduits for information like the public-switched telephone network, video rental outlets, movie theaters, cable television systems, and broadcast radio and television networks as well as the Internet. It includes information-content producers and publishers, such as book and newspaper publishers, television and film production studios, radio talk show hosts, and the people who call in to talk show radio programs. It includes information finders and brokers--entities that facilitate identification and retrieval of information desired by particular consumers--such as critics and reviewers, libraries, bookstores, and newsstands. Some of these activities are highly automated, and some

are not automated at all, relying primarily on human interaction, human voice, and physical transfer of tangible objects containing information value” (Perritt, 1996, p. 11).

With these broad definitions of and expectations for the NII, it is easy to imagine why policymakers challenged with designing economic development strategies for rural areas might find it difficult to arrive at a distinct set of policies that blend economic development objectives with telecommunications infrastructure development planning. This is because, according to the definitions just provided for it, the NII is more than simply basic telecommunications services; it includes a broad range of information and communication conduits that together, facilitate the intra- and internetworking of communities across the country and beyond. Given the ambitious agenda for the NII, a critical question for local economic development practitioners might be how Internet connectivity and the information-sharing and exchange that Internet connectivity facilitates can be harnessed to produce positive economic outcomes in rural areas.

Positive economic outcomes are most typically associated with job growth, and preparing America for the 21st century is an important national concern when anticipating industries’ workforce needs. Recent research suggests that “information is the largest employing sector” (Martin, 1997, p. 191) and that “occupations whose primary function is to handle, distribute, produce, and otherwise manipulate information constitute a large portion of the work we perform” (Martin, 1997, p. 191). According to the United States Department of Labor’s Bureau of Labor Statistics, the services sector will account for virtually all of the new job growth projected between 1994 and 2005. Within this sector, “health services, business services, and social services are expected to account for almost one out of every two jobs added to the economy during the 1994-2005 period. Of the 10 fastest growing industries, nine belong to one of these three industry groups” (Bureau of Labor Statistics, 1997). Specific occupations that are expected to benefit from growth in the services sector include executive, administrative, and managerial occupations; technicians and related support occupations; and marketing and sales occupations.

Additionally over the 1994-2005 time period, national employment in occupations that require education and training is expected to increase. For example, growth rates for occupations that require moderate term on-the-job training are expected to be five percent (5%), as compared to a projected twenty-nine percent (29%) increase for occupations that require a master's degree. The slowest growth is predicted for moderate term (1 to 12 months) on-the-job training types of occupations, indicating the decline in production occupations and manufacturing industries (Bureau of Labor Statistics). Current statistics prepared by the Texas Workforce Commission reflect a trend at the state level that is similar to national trends: an expected increase in service sector jobs. Researchers report that “the Texas labor market has been growing at a rate of 2.7% annually since 1990, adding 1.1 million new jobs through 1996, and over 41% of this increase was in the Services industry.

This raises a question about what lies ahead for Texas' industries” (Gattis and Rodriguez, 1997). Overall employment is expected to continue to grow, and the services sector is expected to add over one million of those jobs. As job opportunities increase for workers in the services sector, research also indicates the types of skills that will be needed in the workplace of the future. And one year after passage of the National Literacy Act in 1991, the U.S. Department of Labor published a national policy report that highlighted the importance of teaching skills in schools that will be required in the workplace. The report established “three clusters of ‘foundation skills’ and five clusters of ‘workplace competencies’” (State Plan, 1997, p. 10). Workplace competency clusters include 1) an ability to allocate resources, 2) interpersonal skills emphasizing teamwork, 3) information, 5) systems, and 6) technology. Three of these skill clusters relate directly to technology-oriented skills. Unfortunately, Texas’ workforce may be inadequately prepared for these jobs or the skills they require.

Texas in the Information Age

In 1995, the Texas Legislature initiated its own deregulatory framework anticipating the benefit of telecommunications industries in the state and economic growth. One of the many policy guidelines of the Texas Public Utility Regulatory Act of 1995, or PURA ‘95, was to “raise the living standards of all Texans by enhancing economic development and improving the delivery of education, health, and other public and private services and therefore play a critical role in Texas’ economic future” (Texas Revised Civil Statutes, Article 146c-O, Section 3.606). One expectation of both of these initiatives is that telecommunications will somehow assist in raising living standards and enhancing economic development in the coming years. For example, as part of the PURA ‘95 legislation, a special fund was created called the Telecommunications Infrastructure Fund whose goal is to provide

assistance in the form of grants to ensure that rural communities are not disadvantaged by this deregulatory legislation.

While telecommunications deregulation has placed economic competitiveness as a primary motivation for revising telecommunications legislation in the state, Texas' workforce may not be ready. Some state officials are concerned about equity and access related to telecommunications services and workforce readiness programs: "Adults estimated to be in need of adult literacy and education services in Texas number above 13 million....The private sector must realize that undereducated adults constitute a vast potential untapped market for technology and information services" (State Plan, 1997, p. 2). Indeed, a national survey of adult in 1994 by the Educational Testing Service (ETS) reported some troubling findings (State Plan, 1997, p. 10-12):

- Texas has the second highest number of undereducated adults in the country;
- In each type of literacy measured--prose, document, and quantitative--Texas full time workers score below their counterparts in the rest of the South and the nation;
- About half, or approximately 6.5 million, of Texas adults fall into the lowest two of the five levels of literacy measured by the survey;
- Half of Texas adults that are classified as poor or near poor scored in lowest literacy level; and
- 19-20% of residents employed full time performed at the lowest literacy level.

These findings may serve to undermine the pro-competitive strategy that PURA '95 seeks to foster if a ready labor market is part of that initiative. And how are rural areas to fare in this push for high-technology growth?

The Rural Challenge in Texas

How these growth statistics and workforce development issues play out in rural areas is of some concern to state level policymakers. Since it was created in 1995, the TIF has awarded millions of dollars to Texas schools, libraries and other public education and health institutions in an attempt to "level the playing field" among communities in terms of their access to Internet services and by extension, the promised benefits of the state's growing information economy. A considerable proportion of TIF's funds have been awarded to rural areas given the TIF's interest in ensuring that rural communities are not left at a disadvantage when it comes to Internet connectivity. TIF views Internet connectivity as a critical aspect of rural areas' ability to participate in the state's economic development initiatives that are supported by advances in telecommunications services. With these statewide goals and initiatives in mind, what kinds of explicit claims can be made as to the role of telecommunications, especially Internet connectivity, to rural economic and community development in Texas?

Although data for the present study were collected prior to the June 1998 Texas Poll, the Poll's results provide a context for understanding more about Internet use in Texas, especially in rural areas of the state. In other words, given that the Poll distinguishes between rural and non-rural Texans on questions related to Internet access and use, it seemed appropriate to include recent findings as background to a discussion about rural Internet service providers. The Poll data provide some indication of the number of Internet users in Texas and the distinctions, if any, between rural and non-rural access and use.

The Poll revealed that almost forty percent (39.5%) of all Texans are using the Internet (whether from home or elsewhere). However, data also indicate that considerably fewer rural Texans are using the Internet than are Texans living in more heavily populated areas. In other words, as Figure 1 indicates, Texans living in large urban areas seem more than three times as likely to use the Internet than Texans living in rural areas.

Figure 1: Rural vs. Non-Rural Internet Users in Texas

	Use Internet %	N
Town/Rural	6.2	(63)
Metro	11.7	(118)
Very Large Metro	21.6	(218)
Total	39.5	(399)

Chi-square = 21.530 (p=.000); Source: June 1998 Texas Poll

It is also interesting to note that when exploring how Texans gain access the Internet, national ISPs seem to win out over both local phone companies and local ISPs (Figure 2 below). However, rural Texans are using local ISPs more than they are national ISPs or even local phone companies for Internet services (see Figure 3 below).

Figure 2: How Texans Access the Internet

	%	N
National ISP	48.3	(143)
Local ISP	31.4	(93)
Local Phone Company	20.3	(60)
Total	100.0	(296)

Chi-square=3.686 (p=.450); Source: June 1998 Texas Poll

Regardless of urban/rural designations, it appears as well that local phone companies are the least used for Internet service providers. It is not clear from the data whether local phone companies are not being used more often as ISPs because they simply do not provide Internet access services, or because other providers are preferable in terms of services offered and service quality.

Figure 3: How Rural Texans Access the Internet

	%	N
Local ISP	6.4	(19)
National ISP	5.7	(17)
Local Phone Company	3.4	(10)
Total	15.5	(46)

Chi-square=3.686 (p=.450); Source: June 1998 Texas Poll

When investigating where Texans access the Internet, the Poll indicates (Figure 4) that regardless of geographic designation, Texans are accessing the Internet from home more than they are from work, school, or the local public library.¹ This has important implications for policy related to public infrastructure projects being developed by Texas' Telecommunications Infrastructure Fund which target public libraries, schools, rural public health care institutions, and public institutions of higher education. If more people, regardless of location, are accessing the Internet from home, what use is being made of the public facilities TIF is funding? In short, what is the local response to TIF's initiatives and how are these initiatives assisting in local community and economic development?

Figure 4: Where Texans Access the Internet (%)

	Very Large Metro		Metro		Town/Rural	
At home	43.6	(174)	23.3	(93)	12.3	(49)
At workplace	31.4	(125)	14.3	(57)	9.3	(37)
At School	8.3	(33)	7.1	(28)	3.5	(14)
At Library	7.8	(31)	4.0	(16)	2.3	(9)

Source: June 1998 Texas Poll

¹ A total of 316 Texans answering the poll indicated that they access the Internet from home, and a total of 296 respondents answered the question about who provides them with Internet service, for the purposes of this study, when asked about who provides them with service, the researcher is assuming that respondents were responding to service to the home.

Telecommunications, Internet Connectivity, and Rural Economic Development

Wilson (1992) studied the impact of telecommunications in rural community development and suggested that the historic lack of commitment to developing rural telecommunications infrastructure is “uncertainty concerning the impact” (Wilson, 1992, p. 289) because it remains unclear as to whether “technology will have a centralizing or decentralizing effect on the location of economic activity” (Wilson, 1992, p. 289). He suggested that telecommunications can play a double role. It can facilitate what Wilson describes as “vertical communications” that include interactions with non-local institutional hierarchies such as outside markets, government agencies, suppliers, and universities. He also maintains that telecommunications are an important facilitator of “horizontal communications.” By horizontal, he means communications that occur within the local community itself or among nearby communities about such things as public resources management and local government (Wilson, 1992, p. 291).

In contrast, most of the U.S. literature on the role of telecommunications in rural economic and community development that is followed by economic development practitioners has tended to focus on how telecommunications can reduce friction created by distance and how this distance serves as a competitive disadvantage to firms. Wilson points out that government policies “rarely recognize the fundamental change occurring in [advanced telecommunications] infrastructure and its critical role in the new economic reality faced by communities, the country, and the world” (Wilson, 1992, p. 289). Previous research has focused on the unique competitive advantages that telecommunications provides specific industry sectors and the spatial impact of that competition. For example, telecommunications may make it possible for firms providing banking, shopping, or medical services to do so using telecommunications services, therefore locating their business activity outside of rural areas. On the other hand, “information-intensive activities, such as back-office operations, may no longer be tied to urban locations” (Wilson, 1992, p. 290).

Other studies of the connection between telecommunications and economic development are more broad in focus; they investigate the socioeconomic aspects of telecommunications infrastructure planning and development. For example, Gandy (1992) situates his discussion of communications infrastructure not in physical space, but “within the social system” (Gandy, 1992, p. ix). To Gandy, “Communication is the process by which all social activity is conducted...By implication, flaws in the infrastructure must be reflected in flaws and failings in the social system” (Gandy, 1992, p. x). Extending this argument, Gandy includes “not only the tangible capital assets, but the human capital necessary to realize the potential of any technical system” (Gandy, 1992, p. x) in an even broader definition of communications infrastructure. He suggests a broadened definition of infrastructure (of which telecommunications is a part) that includes three domains: technical, economic, and cultural. The technical domain includes “hardware, software, and the current state and distribution of technical knowledge which governs their efficient use” (Gandy, 1992, p. xi). This area also involves any institutional practices that support technical efficiencies. The economic domain “includes the market, its structure, and the conduct of key players within these markets” (Gandy, 1992, p. xi). Finally, the cultural domain “includes the values and expectations which govern the acquisition and use of technical resources both within and outside of formal markets” (Gandy, 1992, p. xi).

Gandy rejects outright “the label ‘infrastructure service’ for telecommunications because (quoting Noam) “telecommunications, unlike a lighthouse or a road, it not a public good in the classic sense: users can be excluded and charges can be assessed, breaching the major condition for a public good” (Gandy, 1992, p. xiii). He concludes that “the notion of a national telecommunications infrastructure remains a construct in development [and that] ... its expansion should move in three directions, adding the economic and the values dimension to the more traditional emphasis on technology” (Gandy, 1992, p. xxx).

Arsen also extends analysis of infrastructure into the sociocultural domain by claiming that “The economic significance of infrastructure lies not so much in the stock of physical capital per se as in the flow of services it provides to households and firms” (Arsen, 1997, p. 83). He criticizes research that assumes only that “services can be approximated by measures of infrastructure stock” (Arsen, 1997, p. 84). Instead, he suggests that “Two infrastructure networks that embody exactly the same dollar amount of investment may yield vastly different flows of productive services, or the same services may be generated by very different investment expenditures” (Arsen, 1997, p. 85). Reviewing the literature to determine whether spending or improving infrastructure promotes economic development, Arsen notes that the Clinton Administration’s public investment focus has spurred economists to research how public infrastructure affects private investment activity. Arsen concludes by saying the

“causation runs in both directions” (p. 91), reflecting both demand and supply-side effects: economic growth leads to increase infrastructure and increased infrastructure leads to economic growth.

Egan and Wildman (1992) offer additional reasons for focusing on telecommunications infrastructure and services in economic development programs:

“Communication technologies have been touted as at least partial solutions to perceived problems regarding international competitiveness, inadequacies in the public education system, and the rising costs of health care...Also contributing the fascination with telecommunications as a tool of economic and social policy has been a growing appreciation among academics of the importance of effective communication to economic productivity and the role of organizational design and alternative market structures in overcoming barriers to communication among people and organizations” (Egan and Wildman, 1992, p. 21).

Graham and Marvin echo this view by suggesting that “Telecommunications are firmly embedded in these wider processes of economic and social change. At the most fundamental level, they provide ways of overcoming time and space constraints...They can determine who has access to space, on what basis, how space is reconstituted and which areas are cut off” (Graham and Marvin, 1996, p. 323-324). This is also reflected by Sinha who claims that “Telecommunications, characterized by network externalities and the fact that use of the service does not exclude the use of it by another person, is, in many ways, a quintessential public good” (Sinha, 1991, p. 211).

Finally, Schmandt et al., “policy-makers must be careful not to take competition as the only goal of telecommunications policy” (Schmandt et al., 1989, p. 281). “The growing dependence of our economy and society on information has made telecommunications policy a matter not just for regulators, but for legislators and governors concerned about the future of their states’ economies” (Schmandt et al., 1989, p. 282).

“If one sees telecommunications as infrastructure, an argument for using telecommunications to promote economic development might require a departure from economic efficiency. The telecommunications infrastructure has become analogous to the transportation infrastructure; both are crucial to the economy, but the market operating on its own may not supply sufficient quantities of the service in question. Telecommunications may take on characteristics of a public good” (Schmandt et al., 1989, p. 280).

These theories about the role that telecommunications plays in economic and community development suggest that it is important to examine how information exchange assists local and community development, particularly in rural areas. Hence, this paper advances the notion that rural ISPs may provide a catalyst for the development of telecommunications and information infrastructures in rural areas that would not develop otherwise due to low population densities and subsequently, inadequate infrastructure investments. From a traditional economic development perspective, rural ISPs may not be an important development engine in terms of the number of new jobs they create. However, their presence facilitates potential job growth by other businesses that emerge and grow because of an ISP’s presence. In this way, rural ISPs may serve an intermediary function in rural economic development heretofore unacknowledged by economic development policymakers.

ISPs as Facilitators of “Embeddedness” As an Economic Development Outcome

One way to explore this theory about the potential impact of rural ISPs in facilitating indirectly local community and economic development activity is to evaluate their “embeddedness” in rural communities. Research studies in local and regional economic development indicate that a firm’s “embeddedness” suggests something about its long term commitment to and dependency on a specific geographic area. This embeddedness for telecommunications connectivity may be essential to the survival of rural communities as the NII develops and expands nationwide.

The concept of embeddedness is grounded in economic base analysis, or export base theory, which is the most widely held view of how economic development occurs in a locality or region. This theory assumes that markets outside a region are larger and have a greater capacity for expansion than markets inside a region. For this reason, most regional economic development activity aims to attract dynamic export, or base sector, industries. In this approach, it is particularly important to attract industries that become rooted in, or dependent upon, a local supply architecture so that these industries will be less tempted to locate or expand elsewhere. In other words,

embeddedness results from an export industry’s dependence on a rich local supply base as a foundation for eventual export.

Embeddedness theory also suggests that it is easier to attract firms to locations where there are already similar firms. In non-rural areas, economies of co-location, or agglomeration, depend on a shared local supply base, or the “non-basic” sector. This paper argues that rural ISPs offer Internet connectivity and that this connectivity is a factor in firms’ embeddedness in rural areas. In other words, Internet connectivity is an important locational incentive for firms; it is also a way to ‘embed’ firms into the local business environment. Also, as connectivity providers, ISPs may themselves be more naturally embedded in the local community and may have a stronger economic incentive to increase their customer base than do traditional telecommunications service providers such as the telephone companies that have other, more leveraged, sources of revenue. Large telecommunications providers do not “need” to service rural communities. Economic development strategies that are designed not only to attract export industries but also to retain them, have an interest in supporting and improving the suppliers to these industries.

METHODOLOGY

Considerations about the role of Internet connectivity in rural economic development and the embeddedness of telecommunications providers in rural areas naturally lead to questions about how rural ISPs might assist in the evolution and development of Texas’ information infrastructure. Hence, this study explored the following research questions:

- What is the local impact of Internet “connectivity” to individuals and to businesses in rural areas? In other words, in what ways do rural ISPs support the development and sustainability of rural communities?
- What, if any, economic, regulatory, or competitive barriers do rural ISPs face?

After a study methodology and survey protocol were developed, the researcher sent a request for participation via email to the president of Texas’ Internet Service Providers Association (TISPA), reportedly the largest association of commercial ISPs in the country. The TISPA president attached a cover note encouraging participation and sent this along with the researcher’s request to TISPA’s listserv. Within a week, nine (9) rural ISP directors responded and agreed to participate in the study. The researcher then sent the survey via email to these nine directors. Five completed and returned the questionnaire (also via email). The researcher was able to followup with four of these respondents for an in-depth telephone interview. One of these ISP directors is TISPA’s rural ISP chairman. The following table illustrates the geographic distribution of the ISPs that participated in the study:

Figure 5: Geographic Distribution of Participating ISPs (by county population)

Region ²	July ‘97 Estimated County Population ³	Service Area’s Primary Economic Strength (in decreasing order)
West	2,014	Agriculture
	6,417	Agriculture and Oil
	9,265	Agriculture
North	24,883	Agriculture
East	45,766	Agriculture, Manufacturing, Services

Note that according to recent data from the quarterly Texas Poll, two of these three regions appear to have the lowest percentage of Internet users in the state: East and West.

Figure 6: Internet Users in Texas by Region

² Regions parallel those identified on the Texas Poll.

³ Source: Texas State Data Center (<http://www-txscd.tamu.edu/txpop97.html>)

	Use Internet %	N
East	2.4	(24)
West	3.0	(30)
South	4.6	(47)
Central	5.8	(59)
Gulf	9.9	(100)
North	13.7	(139)
Total	39.5	(399)

Chi-square = 33.829 (p=.000); Source: June 1998 Texas Poll

FINDINGS

All four of the ISP directors who were interviewed for this study represent very new businesses: each began offering services between 1994 and 1996 and it is noteworthy that all provided the first Internet access services both in their towns and in their counties.

Figure 7: Business Organization and Services Summary

	ISP 1	ISP 2	ISP 3	ISP 4
Year established	1996	1994	1996	1996
First ISP in town/county?	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Annual Gross Sales Volume (Reported Annual Growth Rate)	\$135K (100%)	\$480K (100%)	\$75K (10%)	\$80K
Number of Employees (including owner)	1 FT	5 FT; 1 PT	2 FT	5-6contract employees (sales; engineering)
Services offered in addition to basic connectivity*	1, 4, 7	1, 2, 3, 4	1, 6	1, 3, 4
Monthly Subscription Rate	General/local: \$27.50 Police/Fire: \$17.50 School Empl: \$15.00 Remote call forwarded: \$30.00	\$29.95	\$29.00 Business Day Dedicated Dialup: \$49.00 Dedicated Dialup: \$99.00 (offered but no customers as yet)	\$19.95
Local Telco	Southwestern Bell (SWB)	SWB(75%) & GTE (25%)	SWB	GTE

**Key: 1= Web page development; 2=Internet faxing; 3=Database servers; 4=Audio & video services; 5=Netcasting live events; 6=Consulting, custom services, and computing systems; 7=Internet-based training programs; 8=Internet telephony*

Local Impact

What follows are descriptions of various ways in which the rural ISPs interviewed for this study are linked to their communities. **Commitment to the local community** and its needs were common threads among all of the ISP directors interviewed for this study. Three of the four ISP directors indicated that they were originally from the areas where they chose to start their businesses. The fourth ISP director said that he had been a resident for four years prior to starting his ISP. In response to the question about why they started their ISP, all seemed to be responding to their own needs as a community resident as well as community desire for ISP connectivity. For example, one director said that he couldn't persuade anyone to bring the Internet to their area, so he decided to do it himself. Another said that there was no local dial-up service and had he not started his ISP, there would have been little chance it would have been provided otherwise. A third said simply that the rural community needed Internet access.

Among the four directors there was also a mix in terms of any technical preparation for the job. In other words, there doesn't seem to be any reason why an ISP director need be a technical person. One director mentioned that he had been a ham radio operator and that he also had owned a local newspaper for 25 years. His local reputation served him well when he started marketing his services, but he added that he knew nothing about what he was getting into. It was "like a marriage" he said. Another ISP director reported that he didn't actually want to start his business, but he had contacted several national ISPs and they needed a population of 100,000 to even begin to think about servicing his rural region. When this same director called several Texas providers, he discovered that they too had a population minimum, this time 50,000. He added that the local small business development center told him it was a bad idea. Ironically, this ISP director currently has 300 subscribers, a third of which are local businesses, and his sales total approximately \$75,000 yearly with a 10% annual growth rate. Clearly this is more than the full time salary of most rural occupations.

Another of the four ISP directors reported that he too could not get anyone to bring Internet to his community; however, he was a bit more prepared because he owned a computer store and already had some technical background with computing equipment. Another director reported that he had grown up in the area where he started his ISP but left for 20 years and only recently moved back to the area. He said his local roots benefited him because

his customers were dealing with the Internet which was something totally unfamiliar to them, and they appreciated the fact that the ISP director was already a known quantity. In other words, trust matters; being a “local” gave this ISP director credibility and the trust associated with local recognition has contributed to his ability to retain loyal customers in the face of competition from 3 new providers in the area.

In addition to differences in technical preparation for the job, ISP directors reported differing startup costs. For example, one raising his own capital and started with \$30,000 and no customers. By the end of the same year, he had 200 subscribers and gross billings totaling \$90,000. By the end of the following year, his subscriber base had grown to 500, and his gross totaled \$130,000. Another opened his doors with \$15,000.

When asked about their **competition**, all four ISP directors indicated that they had local competitors, a surprising finding given the low population densities in these areas. At present, one of these directors is even battling two local competitors. Another director reported that his competition has pulled 250-300 customers away from his business, but he noted that these customers are switching for cash flow reasons: the competition is slightly cheaper. Apparently, however, he is not concerned about losing these customers because he has noticed that when subscribers switch purely on the basis of cost, the ISP serving those lower income customers is vulnerable because its subscribers tend to have cash flow problems and therefore bill payment problems. In response to this competition, the ISP director interviewed said that he has not dropped his prices; instead, he is concentrating on keeping his existing customer base happy. He noted that his competitive edge is a combination of price, service quality, and local reputation - not just price.

The ISP serving a part of west Texas reported that he too has a local rival who is competing on the basis of price, but he didn't seem very worried either because in his view, this business is differentiated on the basis of service quality. He added also that he grows his business and determines his price increases partly on the basis of user to modem ratios; he says he tries to keep this ratio at 5:1. The ISP director serving an area in north Texas reported that all three of his competitors had outside capital which enabled them to run expensive advertising campaigns when they launched their businesses attacking his incumbent ISP on price. This person's response has been simply to wait and watch. Even though the competition has affected his growth rate, he hasn't experienced any net loss so far.

In general, it was interesting to note that competition was growing in such low population densities. And with few exceptions, competition was local, not national. However, one competitive ISP in the East Texas area offers a local dialup line, but the service is actually owned by a company in Florida. Another ISP director mentioned that his local business has benefited from the fact that America On-Line had advertised free access when in fact there were toll charges that customers hadn't anticipated.

In terms of their supplier networks, all of the ISPs reported national, not state or local vendors. All mentioned that they buy their modems and computing equipment in Dallas or other metromarkets. They make periodic trips to buy equipment that is needed. However, their advertisers are local. As far as employment opportunities are concerned, these rural ISPs seem to manage with one or two employees, including the owner. One ISP mentioned having 5-6 contract employees, mostly in sales, helping him. None of the ISPs interviewed for this study anticipated that their employee base would grow by more than perhaps one person in the next year or so. However, a more interesting aspect of these ISPs' presence in rural Texas is the small business activity that is being generated because of connectivity by some of the business subscribers.

In terms of their customer base, the ISPs reported anywhere from 300 to 1,500 subscribers at present. The following table illustrates the relationships between these ISPs' subscriber base and their gross sales revenues. In each case, there are fewer business subscribers than personal subscribers, but each ISP director interviewed eagerly provided at least one example about how their ISP was helping local businesses grow. When asked about the dominant areas of business that their business subscribers represented, each ISP director mentioned services as the primary sector of his business subscribers.

Figure 8: ISP Customer Base*

	County 1	County 2	County 3	County 4
Total customers (subscribers)	660	1500	300	450
Annual Gross Sales Volume (Annual Growth Rate)	\$135K (100%)	\$480K (100%)	\$75K (10%)	\$80K
Percent business subscriber base	30%	13%	35%	6%
Primary sectors of business subscribers	Primarily Services; also Manufacturing	Primarily Services; also Agriculture; Manufacturing	Primarily Services; also Agriculture; Government; and Manufacturing	Primarily Agriculture and Services

*All data self-reported by ISP directors

One ISP director reported that he receives at least one call every three weeks from individuals wanting to relocate in his region and to these people, having a local ISP is an essential prerequisite for choosing a new residence location. His subscribers are using the Internet in interesting ways. One is a software consultant who telecommutes. Another is a graphic artist for a state agency who sends his graphics into the main agency office via the Internet. Another is a writer who sends articles and book manuscripts to her publishers. Also, a renowned archeologist who lives in the area keeps in touch with people managing his digs in Mexico. Another interesting finding for this ISP is the fact that 30-40% of its personal subscribers are over the age of 50. In fact, several subscribers are in their 70s and 80s.

Another director reported that at least six of his personal accounts were full time telecommuters. One subscriber was working for a company in Atlanta when she had to come back home to take over the family farm. She now goes to Atlanta only three days a month and spends the rest of the time in Texas telecommuting via the Internet. As far as business accounts go, two subscribers sell computers out of their garages and another builds web sites. Another subscriber is a machinist/welder with 10-12 employees who builds and sells grass fire trucks. These are very specialized vehicles that cost somewhere between \$40,000 and \$90,000. The company used to pay for an advertisement in an industry publication which cost \$8-12,000 dollars an issue for one ad. Because of his Internet connection, the owner now advertises on the WWW and has discontinued his previous advertising expenditures. Another subscriber is a John Deere Tractor dealer with \$4 million in inventory. The ISP provides database backup to help manage and unload the dealer's inventory. Finally, a local drugstore started their Internet subscription to "legitimize" themselves to their local customers. The drugstore owners thought that having a website gave them more credibility with customers.

One ISP director was proud that he was supporting several home-based businesses: a candlemaker and someone who builds deer stands for hunting, for example. Also, there are apparently many banks using Internet for branch banking purposes. And two hospitals are using their Internet connection to replace the need to fax government forms. Apparently, this has reduced their overall operational costs. The ISP director reported also that most of his "cream" customers are doctors and lawyers, or "professional people," who need on-line access for personal or other use.

Finally, another director reported that his area was not a technology-based community, but some people are generating a small living using the Internet. One example was one a customer who recently bought a scanner to photograph and advertise antiques over the World Wide Web. Apparently, his website is somewhat popular; it gets over 30 "hits" a day according to the ISP director. This ISP's largest business account is the local newspaper to whom the ISP provides free web space. The paper gets 30-60 hits a day from all over the country. In fact, a congressional office in D.C. checks it every day and the paper's website has been featured on CNN. Another example of how a business is using their Internet connection is an auto parts store that also sells registered dogs, an ice machine business that sells inventory outside the region, and an entrepreneur who manufactures a rare kind of archery bow and advertises it on-line. This local business has received inquiries about the products from all over the world via the WWW.

These rural ISPs also facilitate a certain amount of community connectivity. For example, three of the four ISPs provide the local rural hospital with an Internet connection. One ISP director was recently invited by the junior high

school to teach classes about the Internet. This ISP also provides the local library with its Internet connection. One ISP director said that he provides Internet access to the local school district. He has offered to connect the local library as well, but they are short on space.

Several local and national trade and other organizations were helpful to these rural ISP directors. In every case, the local Chamber of Commerce assisted these startup businesses by allowing the ISP to present an Internet demonstration at a meeting by helping them make customer contacts. One ISP reported that the Chamber had helped him put together a business plan and even to sell stock shares. Another ISP hosts the local Chamber's website while also providing free Internet access to the local school district and to county government offices. For another, the Council of Government serving his region was helpful. In one case, the local Main Street Project was also helpful in that they provide office space in the renovated downtown area. Several ISPs mentioned that TISPA (Texas' ISP Industry Association) had been especially helpful. TISPA helps its members keep up to date on current issues affecting the Internet industry. It also provides counsel on needed issues. One ISP director said he belonged to the national ISPC, or Internet Service Provider Consortium, an organization he had actually helped to form. For the ISP director who had experienced considerable difficulties with the local telephone company, his legislative representative seems to have been helpful. Also, the economic development planning district was of some assistance. In general then, it appears that local ISPs are very involved in one way or another with the local trade and public service organizations. Their presence in their communities has encouraged existing business to experiment with additional businesses on the side using the Internet as a marketing and information dissemination tool. Also, some residents are able to telecommute.

Barriers to Expansion

All four of the ISPs interviewed for this study indicated that they were very committed to their businesses and to the area they're serving with Internet. However, each had a distinct set of concerns that they were eager to communicate. Serving a small population base was voiced by more than one of the ISP directors as a business obstacle. ISPs can grow in terms of subscribership only as large as the surrounding market allows. And because of the low population density, it has also been difficult for some rural ISPs to get the attention of the local telephone company in upgrading lines and service quality. "Local loop" connections link the ISP to the Internet backbone. A critical issue is the amount of distance that is involved in that loop. For example, one of the ISPs ran into particular problems when he tried to get the attention of the local telco in increasing the bandwidth of his local loop and Internet connection.

Several neighboring communities as well as a few more distant communities approached the ISP and inquired as to whether he could expand service into their areas. A plan was in progress for extended area prefix, but not much progress had been made, and the communities were eager to find another solution. The ISP director inquired about providing service with a dedicated line instead of extended area prefix, and, to his surprise, he discovered that the costs for a local loop connection were exorbitant. He claims that the rate quoted to him by the phone company was the "highest rate for a local loop anywhere in the United States." The telco's rather rigid response was that rates were set and not subject to change in different areas. In essence, this ISP director argues that local loop rates make Internet access for rural areas unaffordable because they are mileage-based. Another obstacle that affects the rates telephone companies charge for connectivity is the widely scattered communities in rural Texas. According to one ISP director, another telco charges three times what its competitor charges for dial-up lines. Also, rural local telephone companies are not service-driven, according to one ISP director, and they provide substandard phone lines. Finally, access to capital is another barrier to entry in the ISP business. Most of the ISPs interviewed bankrolled their own startup costs.

INTERPRETATION OF FINDINGS

The interviews conducted for this exploratory study suggest that rural ISPs provide the information infrastructure that facilitates the capability of rural communities to link both vertically and horizontally to markets, employers and suppliers both inside and outside their regions. ISPs are in effect a hybrid industry that combines the common carriage services typically associated with telephone companies with more proactive content development services that assist rural businesses in promoting and marketing their products and services to a population base much larger than that which exists in the rural community itself. In this way, rural ISPs may be a critical subsector of the

emerging digital/information economy that should be cultivated as an important strategic element in rural community and economic development initiatives. The following summarize the findings discussed earlier:

- ISPs are more service-driven than traditional telecommunications companies partly because the larger part of their revenues come from subscribers as opposed to advertisers and service quality as opposed to price is what keeps customers loyal. Partial evidence of this drive to provide good service is evidenced by the fact that ISPs make house calls and some even allow subscribers to bring equipment in for repair.
- The advertisers that place their ads on ISPs' homepages are local, not national. This provides another way for the community to support its own local enterprises.
- ISPs, even with low subscriberships as compared to those required by larger firms are able to provide free connections to local hospitals, libraries, and school districts. Clearly more is at stake in terms of community needs than simply the bottom line.
- Place matters to rural ISPs. All four of the ISP directors interviewed for this study were either from the area of committed to it. Moving isn't an attractive option for them. This was reflected in their answers about why they chose to start their ISPs.
- With the exception of major suppliers for computer and telecommunications equipment, most business relationships are local: competitors, customers, trade association relationships are embedded within the business patterns of these rural ISPs.
- While ISPs don't have many employees they do help generate jobs by helping other businesses to grow and prosper by making their marketing activities more far-reaching through World Wide Web presence.
- Rural ISPs know their customers. They are not a branch office of a corporation based in a large metropolitan area or a megacorporation with a field office where employees have greater loyalty to the corporate center than to the locale in which they work. Good subscriber relations creates loyal customers that stay with ISPs even when cheaper services attempt to compete with them.

In closing, while this study was exploratory in nature, its findings suggest policymakers might form more in-depth analysis of the local impact of rural ISPs in Texas. Additional research might also seek to determine what public and private benefits might be gained by developing public policy mechanisms that encourage the growth and sustainability of rural telecommunications using rural ISPs. The paper suggests that state and local economic development officials consider developing policies that focus on rural ISPs as part of a mix of strategies designed to sustain current public investments in telecommunications infrastructures in rural parts of the state.

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