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Community Assistantship Program

West Central Minnesota Telecommunications Report

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West Central Minnesota Telecommunications Report

Prepared in partnership with the West Central Regional Sustainable Development Partnership

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West Central Minnesota Telecommunications Report

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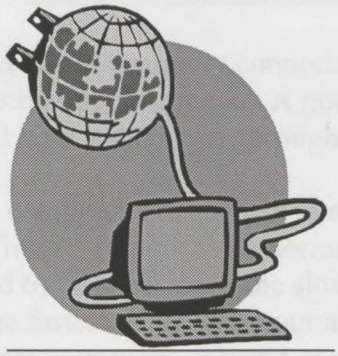


Introduction to West Central Telecommunications

This report is the result of a project funded by the West Central Regional Sustainable Development Partnership in an effort to understand the rapidly developing telecommunications in west central Minnesota. The attempt of this project was to gather information regarding:

- Available Internet Telecommunications and Services in the west central Minnesota region
- Available Education for communities and businesses' in the region
- Assess the Challenges of providing quality telecommunication services
- Assess who is doing what in telecommunications, development and education.

The West Central Regional Sustainable Development Partnership will use this report in determining their role in telecommunications development. They will share the results this project with communities, appropriate businesses' and organizations in this region. To simplify this report, it has been divided into many sections discussing the various aspects of telecommunications in West Central Minnesota. Following the report is a list of appendixes that complement the report and give you direction to research this subject independently.

Telecommunication Hardware

In order to effectively understand how a computer connects to an Internet Service Provider one has to understand the various types of technology available. A good way to imagine how information travels through wire is by thinking about how water flows through a pipe. This analogy will be referred to later in this report.

There are four types of hard wire a computer can connect to an Internet Service Provider through:

- Category Copper Telephone Wiring – Ranges from normal two-line telephone copper wire (CAT 1) to eight lines (CAT 5, 5E and 6). Ranges from the slowest conductor of signal available for Internet connection to one of the fastest. CAT 5 is your all around basic network cable; this is the same cable that might connect your work or home computer to the Local Area Network.

*The application column below is very technical, please see appendix b for terminology definitions, or if viewing through word and your computer is connected to the Internet, simply click on the term to see the definition.

Category	Maximum data rate	Usual application
CAT 1	Less than 1 **Mbps**	**analog** voice signal (normal 2 line telephone cord) **Integrated Services Digital Network** Basic Rate Interface in ISDN Doorbell wiring
CAT 2	4 Mbps	Mainly used in the IBM Cabling System for **token ring** networks
CAT 3	16 Mbps	Voice and data on **10BASE-T Ethernet**
CAT 4	20 Mbps	Used in 16 Mbps Token Ring Otherwise not used much
CAT 5	100 Mbps 1000 Mbps (4 pair)	100 Mbps TPDDI 155 Mbps **ATM** Gigabit Ethernet
CAT 5E	100 Mbps	100 Mbps TPDDI 155 Mbps **ATM**
CAT 6	200-250 **MHz**	Super-fast broadband applications

- Copper Coaxial Cable – Standard cable television wire. Very fast, very reliable and provides an always on Internet environment for your computer. Since this service uses preexisting cable lines, the only disadvantage is the requirement of expensive 750-megahertz circuit upgrades that will only be by the local cable provider if it is cost effective. Speeds are limited by the amount of people using the coaxial for both Internet and television—only so much water can flow through this pipe.
- Fiber Optic Cable – The best available connection. Like coaxial, it provides an always on connection that can only be afforded by the largest of corporations. Fiber optic is considered a limitless data canal; this means that we cannot send too much information through a fiber optic cable at any given time, however speeds do begin to lag after extreme amounts of data are being sent through it. The Minnesota Government used multiple cables of this type to connect every county seat in the state for this reason.
- Microwaves – used to send signals between wireless and satellite Internet connections. It produces Low-level radiation that is described as harmless as television radiation. Only heavy environmental disturbances and dense matter (trees, buildings, etc.) can disrupt these signals.

Internet Connections

The Internet connections available can effectively be divided up into three categories: dial up service, ISDN and broadband connection.

- Dial Up Connection – the original Internet connection requires copper phone lines to carry its signal to the provider. Anyone with a newer computer (within 10 years old), a phone line and somewhere an Internet Service Provider can use this service, but it is already at the point where it effectiveness for anything but web browsing is dwindling. This means it is fine for shopping online, for sending e-mail, or just surfing the web, but upload and download time is slow. Pages with graphics take time to load and unless you possess a super-computer, few other applications will be able to run while you are connected to the Internet. Anyone who can call the provider without long distance charges can use this service. Connections are limited to traveling at speeds of 53 kbps by the Federal Government so that the data transfers do not disrupt normal telephone usage.

- Broadband Connection – the next step(s) in the evolution of Internet connectivity. As fast as any home or average business needs for both uploading and downloading. The Federal Government defines any type of Internet connection that offers download speeds of 256 kbps and uploading speeds of 128 kbps. DSL, coaxial cable, category copper cable, wireless and satellite Internet connections all operate at a minimum of these speeds.

    - *Cable Broadband*

        Currently the most popular form of broadband and virtually unavailable in this region of Minnesota, cable modem service uses the same cables that carry cable TV signals to carry data. You can get cable modem service as a stand-alone service or as an add-on to your current cable TV service. You can watch cable TV and use your cable broadband connection at the same time with no loss of quality.

The main disadvantage of cable is that the speed of the system is dependent on the number of people who are online at the same time; if many people in your neighborhood are using their cable modems at the same time, your connection speed may drop considerably. Cable modem performance can undergo significant fluctuations; at its best, it's the fastest of all consumer-level broadband services, but at its worst, it's almost as slow as a dialup service.

Cable modem service is a good choice if there aren't too many other cable modem users in your area, and you want a system that's easy to set up and maintain. This type of service is only recently being added to the West Central region of Minnesota and may be relatively common in this region in a few years' time.

- *Wireless*

Wireless broadband (also known as fixed wireless to distinguish it from the mobile wireless system used by some pagers and mobile phones) is a new technology that uses an antenna placed on or in your building to send and receive data. The data is transmitted to and from your building via your city's wireless network, which consists of antenna towers placed three to five miles apart.

Currently, fixed wireless broadband service is very limited; however, the service areas are expanding quickly. If you can get wireless, you're getting an excellent broadband connection. The connection speed is not limited by your distance from the wireless antenna or by the number of wireless users in your area. Wireless' speed is currently comparable to ADSL; however, the theoretical maximum is much higher, so you can expect the speed of wireless connections to increase in coming years. Wireless is also an always-on connection that doesn't tie up your phone line. Wireless is a little more expensive than ADSL or cable, but the advantages are probably worth it. Data speeds transfer at up to 45 mBps, but residential service usually runs at about 1.5 mBps with download and upload burst speeds of up to 10 mBps.

- *ISDN*

Technically not broadband because of its low transfer speeds, ISDN is relatively old technology whose main advantages are wide availability and reliability, however this is not the case in west central Minnesota. ISDN (it stands for Integrated Services Digital Network) uses standard copper phone lines to transmit data. ISDN for the home user essentially splits your existing phone line into 2 channels, which can be used to make a phone call and surf the Internet (at 64 kbps), or the channels can be combined for Internet access at twice the speed of one channel (128 kbps).

ISDN is slower than the other, newer forms of broadband. ISDN also offers some advantages over satellite (the other widely-available broadband choice). For instance, ISDN is good for use by networked computers, online gamers, and web-page hosts; these are areas in which satellite's performance lags. ISDN lines are often used by businesses because their speed is reliable and constant; ISDN speed doesn't fluctuate as a result of bad weather, location, or cable modem activity in nearby buildings.

ISDN hardware is often complex and not easy for the novice to set up, and even basic ISDN service is more expensive than other forms of broadband. ISDN is available, if expensive, in only two communities of West Central Minnesota: Alexandria and Sacred Heart.

- *Satellite*

Satellite broadband uses a dish on your house or building to send and receive data from satellites orbiting the Earth. The same dish may be used for satellite TV, depending on the service provider's offering. The main advantage of satellite Internet access over the other forms of broadband technology is its immediate availability; a clear view of the southern sky (in North America) is all that's needed. Thus, in places where cable modem, DSL and ISDN connections may be unavailable, you can still get a broadband connection, literally from out of the clear blue sky.

There are downsides, though. Bad weather, local interference, or a misaligned dish can degrade the performance of a satellite broadband connection. Because of the way the satellite data transfer works, satellite service is not well suited to applications that require constant transmission of small data packets; these include online gaming, web page hosting, video conferencing, and multiple small file downloads. It is also the most expensive of the Internet connections with costs of around $800 to install the system plus monthly fees.

- *Frame relay*

Frame Relay is a WAN (wide area network) that is one of the newest ways for business' to receive affordable Internet connection at high speeds. It works very similar to a LAN (local area network) in most business' today, where every computer is connect via a CAT 5 cable and each can share printers and files across this wiring. Frame Relay is a network of LAN's that combine into a solid WAN connection. The benefits are the shared cost between businesses. Speed is relative to a T1 connection, operating at about 1.54 mBps, depending on the amount of computers using the connection.

- *Category (T1 and T3 direct line in)*

These are direct connections between a business (too expensive for residential) and the Internet provider. Provides the fastest non-wireless service available, with speeds of up to 1.54 mBps for a T1 line and 45 mBps for a T3 line. Both of these lines are Category Five cabling. A Category Seven cable is currently available in Europe, with faster speeds yet, but it is currently not legal for use in the United States.

Explanation of the U.S. Telecommunications Act of 1996

The United States Telecommunications Act of 1996 is currently the primary Federal legislation used to regulate the telecommunications industry today. A brainchild of President Clinton, this act replaced the Capital Act of 1934, which was created to do two things: one, to break up the Mama Bell monopoly that controlled the country's telecommunications industry and two, to create an affordable, standardized cost for equal opportunity communications.

The Telecommunication Act of 1996 does want to create equal opportunity communications like its predecessor, but it does this by deregulating the communications industry. This encourages companies to merge and sell out to bigger businesses to cheapen the cost of telecommunications that should inevitably trickle the savings to the customer. Unfortunately this theory has never been proven to work in the real world. The more money a profit-driven corporation has, the more they want, this is a proven fact and this seems to be the way that things have been working when dealing with big business.

These deregulated profit-driven businesses are not interested in bringing expensive telecommunications equipment into the sparsely populated regions of the state because it is not economically viable for them to do so. It does not seem reasonable to assume that the state run Broadband Initiative Board has the power to incite these national corporations to take such a loss.

In large urban cities and the surrounding suburbia these national deregulated telecommunications companies do have competitors; this competition has driven down cost and caused the research divisions of these companies to create newer and better telecommunications. However, this does nothing to the rural residents of the state who are unable to even access a basic local dial up Internet Service Provider.

Barriers to the Development/ Improvement of WC MN Telecommunication

Three years ago the Department of Administration ran fiber optic cabling to every county seat in the state of Minnesota. Currently the state is practicing a Laze Faire system of government. The Broadband Initiative Board set up by Governor Ventura to insure all Minnesotans receive the availability of affordable broadband Internet service within two more years through discounts and incentives is the only state program regulating this matter. Unfortunately it does not seem reasonable that discounts and tax incentives will encourage national Internet providers to bring expensive broadband equipment to areas with little income and low population density. Only a proactive community willing to devote time and effort in an attempt to bring these technologies to their area will ensure that their community will not be left behind in the Internet Age.

The main obstacles affecting the deployment of advanced telecommunications equipment in all rural areas are distance, low population density and lack of education. The low population of rural communities is spread out over much greater distances than the urban centers. This creates a low profit environment that does not attract business or encourage competition between companies. Rural areas also lack the education more prevalent in Minnesota's urban centers like Minneapolis.

Advanced telecommunications is essentially any form of communication that uses computers to carry on the interaction. Currently the Internet Service Providers available in our nations urban hubs far exceed any conceivable use for them. As time progresses it seems that America will grow more dependant upon these tools and those communities with the resources to stay current with the times will remain competitive while those communities who do not will lose out on opportunities for jobs, education and continue to see the slow migration of rural young people to the large urban areas where jobs are more plentiful and the wages are better.

Without the ability to compete with urban communities via advanced telecommunications, our schools, hospitals and businesses will inevitably suffer in both quality and quantity of service. Schools need advanced telecommunications to teach its children the necessary technological skills. Hospitals need advanced telecommunications to keep up with modern medical advances and to receive opinions from specialists via the Internet thousands of miles away. Businesses need advanced communications to remain competitive with other companies across the globe and increase their market. Without advanced communications many technologically trained people will continue to migrate to larger communities with more opportunity.

Education Requirements and Availability

Most rural communities lack the educational facilities and programs to keep their rural workers on par with the rapidly increasing technological advancements available. Increasing the technological level of rural citizens offers a better chance of new businesses entering the community, creates a higher demand for advanced telecommunications in the area and increases the efficiency of established businesses already serving the community. Right now online colleges—like the University of Phoenix and Capella University are gaining credibility for offering degrees and education to residents unable to attend more traditional school systems.

These Universities offer Associate, Bachelor, Masters' and Doctorate programs online, as well as a plethora of professional certifications like nursing or computing. They are among the leading online learning programs and honor the traditional commitment to knowledge and the pursuit of education. The main difference is that these online courses utilize the best in advanced communication equipment available to create a learning atmosphere with extreme flexibility and control.

The public school system is regulated by the State CFL Department (Children, Family, and Learning—formerly Dept. of Education). They have created a list of what should be taught to each student, grade level by grade level. These requirements are very basic and how well a student does in the class is of no importance. All that is prevalent is that the child is exposed to the technology. There is standardized testing for math, reading comprehension, science and writing, but nothing to ensure that our children graduate high school with the necessary computer skills for college or the workplace. Now this does not mean that an individual school does not raise its' own expectations for their students, but this creates a heterogeneous supply of technology skilled workers.

For elementary schools, the emphasis is mainly on getting the child comfortable around the computer. They are taught how to use the computer itself, the peripherals, like the 3.5" floppy drive, the CD ROM drive, etc. They are taught how to manipulate basic games, word processing programs and the Internet. By the time a young adult graduate high school there are four learning areas involving the use of computers that they must be exposed to. Science, Writing, Inquiry and Math—SWIM—are these areas. These requirements are just as broad as the terminology. If a school desires, all of these areas could be taught in Microsoft Word. Essentially this requires the school to educate the student on how to read, write, do research and math on a computer, but even if a student fails every one of these courses, they could still graduate. There is no testing to prove that a student is competent in these areas.

In West Central Minnesota there are three major facilities that educate people in, among other things, computers and telecommunications: the University of Minnesota, Morris, in Morris, MN; the Alexandria Technical College in Alexandria, MN; and Ridgewater Community College in Willmar, MN. The University of Minnesota, Morris, the Alexandria Technical Institute and the Willmar Technical College, as well as many across the globe, all offer classes via the Internet. The benefits of education being accessible to anyone with a dial up Internet connection, regardless of the distance from the school, are obvious. The programs are a large step toward the continuing education of communities where this was previously unavailable. Keep in mind that no long distance-learning program would be available if the Institutions that offered them were not connected to the Internet via broadband connection.

Besides these, all public libraries have at least one Internet ready computer available for public use and also provide minimal education. Many high schools also offer summer courses in computer training through continuing education programs. Most business' that either sell computers or provide Internet service also offer limited training on their product. The general assumption that these companies make is that anyone who wants to buy a computer or get Internet service already knows how to operate the computer. Midwest Telephone Company sponsored Internet and computer courses for residents of the areas they serve beginning as early as 1996. Eventually these courses were let go because they felt that they had become unnecessary for the community. The investment was no longer cost effective for them to continue it. This maybe true, but it still offers nothing to those people who find a computer intimidating or unnecessary.

Advantages of Advanced Telecommunications

It is no surprise that in this Computer Age, as well as any time period, the greater the quantity and quality of resources a community has the greater its competitive edge. In the Computer Age two of the most important resources are the computer and an Internet connection. It is generally believed and accepted that these technologies are as essential to the rural communities of West Central Minnesota as our roads and highways, according to the Minnesota Department of Administration.

What the Internet can do for rural communities is bring the most important advantages of urban life, being competitive job wages and opportunities, first-rate medicine and education, to the rural communities. Distance has always been an issue for rural communities: one must drive to work, to school, to go shopping, etc. Now all of these can be done from the comfort of the home. The savings of time and money increases the quality of life for rural people and businesses alike.

Telecommuting allows a worker to stay at home and work for a company through the workers home computer via a broadband Internet connection. Workers can live in their rural communities and work for companies across the globe. Rural companies can employ workers all over the state. This option offers tremendous opportunities for both workers and companies and its full potential has yet to be utilized.

Telemedicine (or telehealth) is perhaps the one Internet application that's future is uncertain. Telemedicine requires expensive equipment, training and a paid position for someone to monitor the computer systems. Telemedicine is a broad term that essentially describes any implementation of the Internet and medicine. It has progressed into a state of art network of medical professionals and equally impressive applications. Currently, a patient who is sick may stay home and receive the same level of care they would have in the hospital. Monitoring machines are now designed to plug into a person's home computer and send the information it gathers across the Internet to the medical professionals. Another advantage is that through telemedicine doctors can easily consult with specialists across the globe and have quick, easy access to a continuously updated online medical reference.

What typically happens with hospitals is that they go out and get telemedicine installed in their facility and then eventually turn it off because no one uses it. The problem with this is that the hospital never trained their doctors or nurses on how to run the system. The administrators must assume that because of a doctor's extensive education they simply know how to use technology. This is not the case. This exact same situation took place at Stevens County Medical Center. What this shows is the importance of continually educating and training workers so they can stay on top of the technology curve.

Community wide workforce technology development programs are needed to sustain rural Minnesota's work force (Minnesota Planning, TNT). Coupled with broadband Internet connection, these technology programs can attract businesses to rural communities and stop the migration of technology skilled workers to urban areas. There are many forms of these classes already offered through the Internet, some charge for their service and some are free--like Computer Training 2000 (http://www.computertim.com/)--but first the workers must have at least minimal access to the Internet.

Every community needs an individual plan backed by local leadership with a long-term, proactive attitude toward telecommunications development. Schools and businesses need advanced telecommunications with broadband service to allow them to compete with urban schools and businesses backed by more money, better location for commercial distribution and a larger, more educated worker pool. The goal for any community wanting to stay competitive with larger markets is to create a localized high speed, always on Internet Infrastructure. The Internet offers a worldwide consumer base with which to sell a company's product.

Goals of a Pro-Technology Community

While every community has its own independent needs and wants, a generalized list of what every community should do to advance its technology base is as follows:

- **Develop programs to attract and retain highly skilled workers**
- **Create incentives to encourage broadband service for community**
- **Create incentives for businesses to provide training for employees**
- **Ensure that local K-12 and college systems create technology literate workers**
- **Encourage local clinics and hospitals to implement telemedicine**

Technological literate workers are the backbone of any technological literate community, but many rural people leave their rural homes to go to urban areas for both education and more job opportunity. The University of Mankato took a poll that revealed that many people with technological skills and post-secondary education would prefer to stay in their original rural communities if only they could receive competitive wages and opportunities. If we want to keep these technology literate workers in rural communities we must offer them jobs and continuing education to keep them on par with the urban communities.

Public and Private Assistance Programs

Public Assistance Programs

There are many resources available for proactive communities interested in broadband Internet service. Net Plan is a free publication produced from a variety of Minnesota State Agencies to assist communities in finding what their technological needs are (http://www.mnplan.state.mn.us/pdf/2000/planning/netplan.pdf). It is a basic 32 page guide that explains how to gather the needs of a specific community, how to find the right Internet connection resource and how to implement it into a long term plan.

The State of Minnesota publishes a weekly electronic web page e-zine and a printed newsletter that among other things, list the current available grants. The web page e-zine can be found at: http://www.comm.media.state.mn.us/bookstore/stateregister.asp.

State Educational Grants can be found at:
http://www.schoolgrants.org/

The Federal Government divides the grant giving departments up. To look at small and disadvantaged business grants, go to:
http://www.osec.doc.gov/osdbu/Other_small_business_resources.htm

Federal Technology Grant Programs are found at:
http://www.senate.gov/~wyden/feature/bookwww.htm

Telecommunication subsidies have been used since the 1930's to bring down the cost of communications in rural areas. The primary source of these subsidies is the Universal Service Funding. The Universal Service Fund counters the high cost of companies bringing telecommunications to rural areas. While it does not directly give funding for advanced Internet telecommunications, it does offset the price of voice communications (basic telephone service) giving local exchange carriers extra money to spend on rural telecommunications upgrades.

Another subsidy offered is E-Rate. E-Rate reimburses schools and libraries in rural and low-income communities for installing high-speed telecommunications. Grants and scholarships are also offered. Theses programs have proven beneficial toward improving the quality of life in West Central Minnesota, as well as the entire nation, however, they are not perfect. The following list explains the problems that inhibit the growth of rural Minnesota:

- All government funding as of now currently goes to hard-line telephone providers. None of it is offered to the wireless or satellite providers that offer the fastest Internet connection speeds and are the only way for some communities, especially those with low population density, to receive the Internet.
- Government subsidiaries do allow non-profit hospitals grants and/or loans to set up this kind of connection, but most rural clinics and small town physicians fall into this category.

Private Assistance Programs

The Southwest Minnesota Foundation sponsors the TNT Project—The Technology and Telecommunications Project for Southwest Minnesota—as well as multiple programs that sustain or develop Southwestern Minnesota communities. They can be reached at: http://www.swmnfoundation.org/ or info@swmnfoundation.com.

The Patrick and Aimee Butler Family Foundation gives hundreds of thousands of dollars every year to organizations for projects ranging from historical preservation to drug abuse prevention to creating a sustainable rural Minnesota. They can be reached at: http://www.butlerfamilyfoundation.org/ and *info@butlerfamilyfoundation.org*.

Various assistance foundations are out there. The best way to find one to meet your need is to find a similar program somewhere else and see whom they received their assistance from. Most people already in the process of sustaining rural Minnesota are more than happy to assist someone paralleling their own efforts.

Developing West Central Minnesota Telecommunications

Organizations Involved In WC Telecommunications Development

The progress of two organizations stand out in the West Central region of Minnesota: WesMN and TNT (The Technology and Telecommunications Project for Southwest Minnesota). These proactive organizations work with local companies and other organizations to sustain and develop the telecommunications network of West Central Minnesota.

WesMN is both supported and/ or in partnership with at least 13 telephone companies and businesses in a nine county region including five covered in this report: Traverse, Grant, Douglas, Pope and Stevens Counties. The other four lie north and include: Otter Tail, Wilkin, Clay and Becker Counties.

> "WesMN.net exists to facilitate the development of a broad base of telecommunication and technology applications and services to enhance the quality of life in west central Minnesota."
>
> - WesMN Brochure

Organized in September 1999, lately WesMN has made progressive strides in their communities' ability to develop E-Commerce, Telecommuting and Video Conferencing to create an improved business atmosphere. Their vision is to create an incorporated telecommunications network to facilitate a sustainable rural environment. Their reason for spending so much time and resources on this is that they believe that the Internet and the applications that can be used across it will ensure that the health care facilities, businesses, schools and residents of these communities will operate to the fullest of their potential.

WesMN holds regular meetings that bring together local and national businesses' and the residents that they affect and usually get between forty and seventy people to come. Together these people discuss that is being done, what could be done and what will be done. WesMN takes these discussions and comments and implements them into their actions. WesMN also offers classes to introduce new technologies to the communities and welcome both businesses and residents of their communities to join. A non-profit organization, WesMN was developed by local businesses to develop a sustainable environment for all west central Minnesotans.

The Technology and Telecommunications Project for Southwest Minnesota, hereafter referred to as TNT, is located in the southwest portion of the state and overlaps the southwestern communities this report is examining. The seven counties covered in this report include Big Stone, Swift, Chippewa, Kandiyohi, Renville, Yellow Medicine and Lac Qui Parle Counties. The nine counties that they work with not included in this report are Lincoln, Lyon, Redwood, Cottonwood, Jackson, Nobles, Rock, Pipestone, and Murray Counties.

> "The TNT Consortium is comprised of a group of stakeholders and providers from Southwestern Minnesota aggressively committed to economic development through technology adaptation. This consortium will assist and encourage local businesses, communities, educational institutions and citizens (individually and professional) to prosper or expand within the communities of Southwest Minnesota. Education and training are core components to enhance and utilize technology and telecommunications."
>
> - TNT "Making the Connection" brochure

Officially beginning in April 2000, over a period of ninety days a group of over 80 representatives met to discuss the scope and goals of TNT. They divided their initiatives into three basic categories:

Technology Centers, places where businesses and communities can come to for technological advice; communicating with businesses for telecommunications' support and expansion; and technology training, education and awareness.

Basically, the goal of the TNT organization is to assist community development with regards to telecommunications. They work hand in hand with new and old businesses alike to develop the best computer and advanced telecommunications system the group can afford. This service has allowed the TNT Project to attract new businesses and educational facilities into rural Minnesota. A good example of this is the National Technology Center that recently set up in Lakefield, Minnesota.. A quote from their "Progress" brochure states, "We would have never considered locating in southwest Minnesota if it weren't for TNT. They showed us the opportunity that is here," Dale Petelinsek, the CEO of the National Tech Center who decided to place the college in Lakefield. Of course it did not hurt any that Lakefield is e-commerce certified.

When TNT meets with a business they go through a series of questions to assess their needs. First, they assess the current state of the business' technology including all computer software and hardware and the state of advanced telecommunications options available. Second, they develop an understanding of what the company's goals are. Third, they recommend the correct approach to meet the needs of the business. This is a non-profit assessment to improve the quality of life in Southwest Minnesota.

Both WesMN and TNT show no signs of slowing down. In fact it is entirely the opposite. They trends they began are catching on. It is this proactive spirit that will sustain the west central Minnesota. Government departments are overworked as they are and show no signs of changing their policies. If we want a sustainable future for our children where opportunity is as competitive here as it is in the rural areas, we must follow this trend and develop our communities with out own sweat and time.

Current Events and E-Commerce Certification

E-Commerce certification is a relatively new and wonderful way for small rural communities to attract the attention of new businesses. It is like a Star City of the 21st Century. Created in 1999, it has only recently gained the attention it deserves. It gives communities with a high level of telecommunication resources a chance to apply for e-commerce certification. If their application is accepted, then the community can advertise this and attract businesses.

The requirements for e-commerce certification are broadband connections available for the residential community and 512 kbps connections for business and that these connections are substantially used by government facilities, schools and businesses. The payoff is now businesses are aware of this certification and look for it when they create new facilities.

Bob Erickson, Lakefield Administrator, says that since Lakefield received its e-commerce certification, the small town of Lakefield--which had never before been considered--has large corporations looking to bring businesses and more importantly, jobs, to their community because of the quality of their telecommunications.

Appendix A

Further Exploration

The following links will take you to the web pages of government departments, independent organizations and private business' that will give you more insight into this telecommunications project:

Minnesota Broadband Internet Inititiative Online -
http://www.admin.state.mn.us/internet_initiative.html

The United States Telecommunications Act of 1996 Online (Summery) - http://www.ntia.doc.gov/opadhome/overview.htm

WesMN.net Web Page –
http://www.wesmn.net

TNT (Technology and Telecommunications Project for SW MN) Web Page –
http://www.tntswmn.org

Ridgewater Community College Web Page -
http://www.ridgewater.mnscu.edu/

University of Minnesota, Morris Web Page -
http://www.mrs.umn.edu

Alexandria Technical College Web Page -
http://alextech.org

University of Phoenix Web Page -
http://www.phoenix.edu/index.html

Capella University Web Page -
http://www.capellauniversity.edu/schools_home_page/final.asp

Florida Center for Instructional Technology Web Page -
This web page offers various online publications and resources for those interested in teaching courses in technology. Please go to the On-Line Publications and Products section of the home page at the bottom.
http://fcit.coedu.usf.edu/

Minnesota Department of Commerce Web Page -
http://www.commerce.state.mn.us/

Minnesota Department of Trade and Economic Development Web Page -
http://www.dted.state.mn.us/

Appendix B

Glossary of Terms (Y)
For any terminology not listed, feel free to search the
Glossary of Academic Information Technology Terms
http://www-rohan.sdsu.edu/glossary.html

Advanced Telecommunications-	Any telecommunications beyond basic telephone service
Always on connection-	With this service, one's computer has access to the Internet 24 hours a day without delay
Byte-	A group of eight bits, the smallest addressable unit of information a computer can access.
Broadband-	any form of data transmission that runs at a rate of 200 kbps in both downloading and uploading
Communication Exchange Carrier-	Telecommunications company (Qwest, etc)
kbps-	kilobytes per second (one thousand bytes per second transfer speed)
Download-	When a computer receives data
Interactive Television-	Educational classes offered via the Internet to schools across the country
mBps-	Megabits per second (one million bits per second transfer speed)
Telecommuting-	Working for a corporation through one's home via Internet
Telemedicine-	Allows smaller to confer with larger hospitals across the country via the Internet.
Upload-	When a computer sends data

Appendix C

Internet Service Provider Data Tables

Table One – Listing by County and City

County	City	Internet Service Providers	Dial Up	Wire BroadBnd	Wirlss BroadBnd	Web Page	Phone Number
All	Anywhere US	Earth Link (per minute fee)	Toll Free DU				800 395 8425
All	Out of Alexandria	Digital First			Satellite		320 762 7077
Big Stone	Beardsley	Info Link	DU			Devel, Host	320 589 1330
Big Stone	Clinton	Info Link	DU			Devel, Host	320 589 1330
Big Stone	Correl	Federated TelCo	DU			Hosting	320 324 7111
Big Stone	Graceville	Info Link	DU			Devel, Host	320 589 1330
Big Stone	Odessa	Federated TelCo	DU	DSL		Hosting	320 324 7111
Big Stone	Ortonville	Info Link	DU		Wireless	Devel, Host	320 589 1330
Chippewa	Big Bend	Federated TelCo	DU			Hosting	320 324 7111
Chippewa	Clara City	Bennet Office Tech	DU			Hosting	320 235 6425
Chippewa	Clara City	Clara City TelCo	DU	DSL			320 847 2211
Chippewa	Maynard	Clara City TelCo	DU	DSL			320 847 2211
Chippewa	Milan	Federated TelCo	DU	DSL		Hosting	320 324 7111
Chippewa	Montevideo	Bennet Office Tech	DU			Hosting	320 235 6425
Chippewa	Montevideo	Info Link	DU		Wireless	Devel, Host	320 589 1330
Douglas	Alexandria	Charter Comm	DU	DSL; Cable			800 493 7824
Douglas	Alexandria	Gardonville Co-op	DU			Hosting	320 524 2211
Douglas	Alexandria	Image Flight			Wireless		320 763 6888
Douglas	Alexandria	REA-ALP	DU	T1	Wireless	Hosting	320 762 1121
Douglas	Alexandria	Rural Cell Comm	DU				320 762 2000
Douglas	Brandon	Gardonville Co-op	DU	DSL		Hosting	320 524 2211
Douglas	Carlos	Charter Comm		Cable			800 493 7824
Douglas	Carlos	Gardonville Co-op	DU			Hosting	320 524 2211
Douglas	Carlos	REA-ALP	DU	T1		Hosting	320 762 1121
Douglas	Eagle Bend	TDS Telcomm	DU	DSL		Hosting	320 859 2700
Douglas	Evansville	Grdonville Co-op	DU	DSL		Hosting	320 524 2211
Douglas	Garfield	REA-ALP	DU	T1		Hosting	320 762 1121
Douglas	Glenwood	Rural Cell Comm	DU		Wireless		320 762 2000
Douglas	Holmes City	Gardonville Co-op	DU			Hosting	320 524 2211

Douglas	Holmes City	REA-ALP	DU	T1		Hosting	320 762 1121
Douglas	Kensington	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Douglas	Millerville	Gardonville Co-op	DU	DSL		Hosting	320 524 2211
Douglas	Miltona	TDS Telcomm	DU	DSL		Hosting	320 859 2700
Douglas	Osakis	TDS Telcomm	DU	DSL		Hosting	320 859 2700
Douglas	Parkers Prairie	TDS Telcomm	DU			Hosting	320 859 2700
Douglas	Urbank	TDS Telcomm	DU	DSL		Hosting	320 859 2700
Grant	Ashby	Park Region Mutl TelCo	DU	DSL	Wireless	Hosting	218 826 6161
Grant	Barret	Info Link	DU			Devel, Host	320 589 1330
Grant	Barret	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Grant	Elbow Lake	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Grant	Herman	Info Link			Wireless	Devel, Host	320 589 1330
Grant	Herman	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Grant	Hoffman	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Grant	Norcross	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Grant	Underwood	Park Region Mutl TelCo	DU	DSL	Wireless	Hosting	218 826 6161
Grant	Wendell	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Kandiyohi	Atwater	Charter Comm		Cable			800 493 7824
Kandiyohi	Irving	Charter Comm		Cable			800 493 7824
Kandiyohi	Kandiyohi	Charter Comm		Cable			800 493 7824
Kandiyohi	New London	Charter Comm		Cable			800 493 7824
Kandiyohi	New London	TDS Telcomm	DU	DSL		Hosting	800 434 2121
Kandiyohi	Pennock	Charter Comm		Cable			800 493 7824
Kandiyohi	Pennock	TDS Telcomm	DU			Hosting	800 434 2121
Kandiyohi	Prinsburg	Bennet Office Tech	DU	DSL	Wireless	Hosting	320 235 6425
Kandiyohi	Raymond	Bennet Office Tech			Wireless	Hosting	320 235 6425
Kandiyohi	Spicer	Charter Comm		Cable			800 493 7824
Kandiyohi	Spicer	TDS Telcomm	DU			Hosting	800 434 2121
Kandiyohi	Sunberg	TDS Telcomm	DU			Hosting	800 434 2121
Kandiyohi	Svea-Blomkest	Bennet Office Tech			Wireless	Hosting	320 235 6425
Kandiyohi	Willmar	Bennet Office Tech	DU	DSL; T1	Wireless	Hosting	320 235 6425
Kandiyohi	Willmar	Charter Comm		Cable			800 493 7824
Lac Qui Parle	Ballingham	Farmers Mutual TelCo	DU	DSL			320 568 2105

Lac Qui Parle	Boyd	Rural Link	DU				320 848 6611
Lac Qui Parle	Cerro Gordo	Farmers Mutual TelCo	DU	DSL			320 568 2105
Lac Qui Parle	Marietta	Farmers Mutl TelCo	DU	DSL			320 568 2105
Pope	Brooten	TDS Telcomm	DU			Hosting	800 434 2121
Pope	Cyrus	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Pope	Glenwood	Bennet Office Tech	DU	DSL	Wireless	Hosting	320 235 6425
Pope	Glenwood	Info Link	DU			Devel, Host	320 589 1330
Pope	Lowry	Info Link	DU			Devel, Host	320 589 1330
Pope	Lowry	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Pope	Sedan	TDS Telcomm	DU			Hosting	800 434 2121
Pope	Starbuck	Info Link	DU			Devel, Host	320 589 1330
Pope	Starbuck	Starbuck TelCo		DSL			320 239 2211
Pope	Terrace	TDS Telcomm	DU			Hosting	800 434 2121
Pope	Villard	TDS Telcomm	DU			Hosting	800 434 2121
Renville	Buffalo Lake	Hector Comm	DU	DSL		Hosting	800 992 8857
Renville	Danube	TDS Telcomm	DU			Hosting	800 434 2121
Renville	Franklin	MN Valley TelCo	DU				507 557 2275
Renville	Hector	Hector Comm	DU	DSL		Hosting	320 848 6611
Renville	Morton	MN Valley TelCo	DU				507 557 2275
Renville	Olivia	Bennet Office Tech			Wireless	Hosting	320 235 6425
Renville	Renville	Bennet Office Tech	DU				
Renville	Sacred Heart	Sacred Heart TelCo	DU	DSL; ISDN			320 765 2235
Stevens	Chokio	Federated TelCo	DU	DSL		Hosting	320 324 7111
Stevens	Chokio	Info Link	DU			Devel, Host	320 589 1330
Stevens	Donnelly	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Stevens	Hancock	Federated TelCo	DU	DSL		Hosting	320 324 7111
Stevens	Hancock	Info Link			Wireless	Devel, Host	320 589 1330
Stevens	Morris	Hometown Solutions	DU	DSL;Cbl;T1	Wireless	Hosting	320 585 4875
Stevens	Morris	Info Link	DU		Wireless	Devel, Host	320 589 1330
Swift	Appleton	Bennet Office Tech			Wireless	Hosting	320 235 6425
Swift	Appleton	Info Link	DU			Devel, Host	320 589 1330
Swift	Benson	Bennet Office Tech	DU	DSL	Wireless	Hosting	320 235 6425
Swift	Benson	Charter Comm		Cable			800 493 7824
Swift	Benson	Info Link	DU			Devel, Host	320 589 1330
Swift	Clontarf	Bennet Office Tech	DU			Hosting	320 235 6425
Swift	Danvers	Federated TelCo	DU	DSL		Hosting	320 324 7111
Swift	Holloway	Bennet Office Tech	DU			Hosting	320 235 6425

Swift	Holloway	Federated TelCo	DU	DSL		Hosting	320 324 7111
Swift	Kerkhoven	Bennet Office Tech			Wireless	Hosting	320 235 6425
Swift	Kerkhoven	Charter Comm		Cable			800 493 7824
Swift	Kerkhoven	TDS Telcomm	DU			Hosting	800 434 2121
Swift	Murdock	Bennet Office Tech			Wireless	Hosting	320 235 6425
Swift	Murdock	Charter Comm		Cable			800 493 7824
Swift	Murdock	TDS Telcomm	DU			Hosting	800 434 2121
Traverse	Browns Valley	Valley TelCo	DU				320 695 2111
Traverse	Tintah	Runestone TelCo	DU	DSL		Hosting	320 986 2013
Traverse	Wheaton	WAHS	DU			Hosting	320 563 8282
Yellow Medicine	Clarkfield	Rural Link	DU				320 669 7177
Yellow Medicine	Echo	Earth Link	DU				800 395-8425
Yellow Medicine	Granite Falls	Kilowatt Comp Services	DU		Wireless	Hosting	320 564 1266
Yellow Medicine	Granite Falls	MVTV			Wireless	Hosting	320 564 4807
Yellow Medicine	Hanley Falls	MN Valley TelCo	DU				507 557 2275
Yellow Medicine	Wood Lake	Earth Link	DU				800 395-8425

Table Two – Listings by Business

Internet Service Providers	Dial Up	Wire BroadBnd	Wirlss BroadBnd	Web Page	City	County	Phone Number
Bennet Office Tech	Dial Up			Hosting	Clontarf	Swift	320 235 6425
Bennet Office Tech	Dial Up	DSL	Wireless	Hosting	Glenwood	Pope	320 235 6425
Bennet Office Tech	Dial Up			Hosting	Holloway	Swift	320 235 6425
Bennet Office Tech			Wireless	Hosting	Kerkhoven	Swift	320 235 6425
Bennet Office Tech	Dial Up			Hosting	Montevideo	Chippewa	320 235 6425
Bennet Office Tech			Wireless	Hosting	Murdock	Swift	320 235 6425
Bennet Office Tech			Wireless	Hosting	Olivia	Renville	320 235 6425
Bennet Office Tech	Dial Up	DSL	Wireless	Hosting	Prinsburg	Kandiyohi	320 235 6425
Bennet Office Tech			Wireless	Hosting	Raymond	Kandiyohi	320 235 6425
Bennet Office Tech	Dial Up			Hosting	Renville	Renville	320 235 6425
Bennet Office Tech			Wireless	Hosting	Svea-Blomkest	Kandiyohi	320 235 6425
Bennet Office Tech	Dial Up	DSL; T1	Wireless	Hosting	Willmar	Kandiyohi	320 235 6425
Bennet Office Tech	Dial Up			Hosting	Clara City	Chippewa	320 235 6425
Bennet Office Tech			Wireless	Hosting	Appleton	Swift	320 235 6425
Bennet Office Tech	Dial Up	DSL	Wireless	Hosting	Benson	Swift	320 235 6425
Charter Comm		Cable			Atwater	Kandiyohi	800 493 7824
Charter Comm	Dial Up	DSL; Cable			Alexandria	Douglas	800 493 7824
Charter Comm		Cable			Benson	Swift	800 493 7824
Charter Comm		Cable			Carlos	Douglas	800 493 7824
Charter Comm		Cable			Irving	Kandiyohi	800 493 7824
Charter Comm		Cable			Kandiyohi	Kandiyohi	800 493 7824
Charter Comm		Cable			Kerkhoven	Swift	800 493 7824
Charter Comm		Cable			Murdock	Swift	800 493 7824
Charter Comm		Cable			New London	Kandiyohi	800 493 7824
Charter Comm		Cable			Pennock	Kandiyohi	800 493 7824
Charter Comm		Cable			Spicer	Kandiyohi	800 493 7824
Charter Comm		Cable			Willmar	Kandiyohi	800 493 7824
Clara City TelCo	Dial Up	DSL			Clara City	Chippewa	320 847 2211
Clara City TelCo	Dial Up	DSL			Maynard	Chippewa	320 847 2211
Digital First			Satelite		Alexandria	Douglas	320 762 7077
Earth Link (per minute fee)	Toll Free Dial Up				Anywhere US	All	800 395-8425
Earth Link	Dial Up				Echo	Yellow Medicine	800 395-8425

Earth Link	Dial Up				Wood Lake	Yellow Medicine	800 395-8425
Farmers Mutl TelCo	Dial Up	DSL			Ballingham	Lac Qui Parle	320 568 2105
Farmers Mutual TelCo	Dial Up	DSL			Cerro Gordo	Lac Qui Parle	320 568 2105
Farmers Mutual TelCo	Dial Up	DSL			Marietta	Lac Qui Parle	320 568 2105
Federated TelCo	Dial Up			Hosting	Big Bend	Chippewa	320 324 7111
Federated TelCo	Dial Up	DSL		Hosting	Chokio	Stevens	320 324 7111
Federated TelCo	Dial Up			Hosting	Correl	Big Stone	320 324 7111
Federated TelCo	Dial Up	DSL		Hosting	Danvers	Swift	320 324 7111
Federated TelCo	Dial Up	DSL		Hosting	Hancock	Stevens	320 324 7111
Federated TelCo	Dial Up	DSL		Hosting	Holloway	Swift	320 324 7111
Federated TelCo	Dial Up	DSL		Hosting	Milan	Chippewa	320 324 7111
Federated TelCo	Dial Up	DSL		Hosting	Odessa	Big Stone	320 324 7111
Gardonville Co-op	Dial Up			Hosting	Alexandria	Douglas	320 524 2211
Gardonville Co-op	Dial Up	DSL		Hosting	Brandon	Douglas	320 524 2211
Gardonville Co-op	Dial Up			Hosting	Carlos	Douglas	320 524 2211
Gardonville Co-op	Dial Up	DSL		Hosting	Evansville	Douglas	320 524 2211
Gardonville Co-op	Dial Up	DSL		Hosting	Garfield	Douglas	320 524 2211
Gardonville Co-op	Dial Up			Hosting	Holmes City	Douglas	320 524 2211
Gardonville Co-op	Dial Up	DSL		Hosting	Millerville	Douglas	320 524 2211
Garnate Internet Services	Dial Up			Devel, Host	Garfield	Douglas	320 834 2872
Hector Comm	Dial Up	DSL		Hosting	Buffalo Lake	Renville	800 992 8857
Hector Comm	Dial Up	DSL		Hosting	Hector	Renville	320 848 6611
Hometown Solutions	Dial Up	DSL; Cable;T1	Wireless	Hosting	Morris	Stevens	320 585 4875
Image Flight			Wireless		Alexandria	Douglas	320 763 6888
Info Link	Dial Up			Devel, Host	Appleton	Swift	320 589 1330
Info Link	Dial Up			Devel, Host	Barret	Grant	320 589 1330
Info Link	Dial Up			Devel, Host	Beardsley	Big Stone	320 589 1330
Info Link	Dial Up			Devel, Host	Benson	Swift	320 589 1330
Info Link	Dial Up			Devel, Host	Chokio	Stevens	320 589 1330
Info Link	Dial Up			Devel, Host	Clinton	Big Stone	320 589 1330
Info Link	Dial Up			Devel, Host	Glenwood	Pope	320 589 1330
Info Link	Dial Up			Devel, Host	Graceville	Big Stone	320 589 1330
Info Link			Wireless	Devel, Host	Hancock	Stevens	320 589 1330
Info Link			Wireless	Devel, Host	Herman	Grant	320 589 1330
Info Link	Dial Up			Devel, Host	Lowry	Pope	320 589 1330
Info Link	Dial Up		Wireless	Devel, Host	Montevideo	Chippewa	320 589 1330

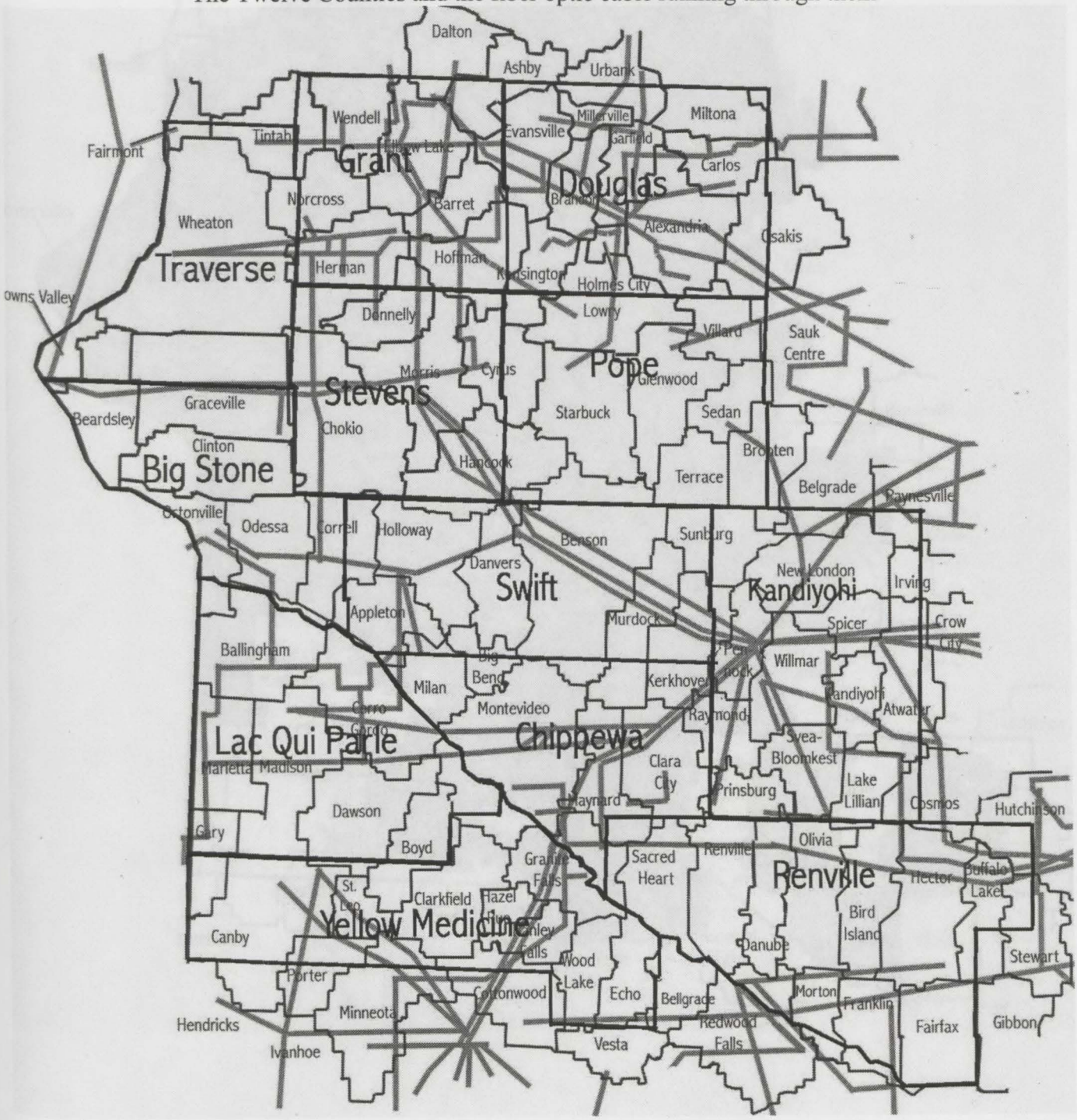
Info Link	Dial Up		Wireless	Devel, Host	Morris	Stevens	320 589 1330
Info Link	Dial Up		Wireless	Devel, Host	Ortonville	Big Stone	320 589 1330
Info Link	Dial Up			Devel, Host	Starbuck	Pope	320 589 1330
Kilowatt Comp Services	Dial Up		Wireless	Hosting	Granite Falls	Yellow Medicine	320 564 1266
MN Valley TelCo	Dial Up				Franklin	Renville	507 557 2275
MN Valley TelCo	Dial Up				Hanley Falls	Yellow Medicine	507 557 2275
MN Valley TelCo	Dial Up				Morton	Renville	507 557 2275
MVTV			Wireless	Hosting	Granite Falls	Yellow Medicine	320 564 4807
Park Region Mutl TelCo	Dial Up	DSL	Wireless	Hosting	Ashby	Grant	218 826 6161
Park Region Mutl TelCo	Dial Up	DSL	Wireless	Hosting	Underwood	Grant	218 826 6161
REA-ALP	Dial Up	T1	Wireless	Hosting	Alexandria	Douglas	320 762 1121
REA-ALP	Dial Up	T1		Hosting	Carlos	Douglas	320 762 1121
REA-ALP	Dial Up	T1		Hosting	Garfield	Douglas	320 762 1121
REA-ALP	Dial Up	T1		Hosting	Holmes City	Douglas	320 762 1121
Runestone TelCo	Dial Up	DSL		Hosting	Barret	Grant	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Cyrus	Pope	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Donnelly	Stevens	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Elbow Lake	Grant	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Herman	Grant	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Hoffman	Grant	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Kensington	Douglas	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Lowry	Pope	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Norcross	Grant	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Tintah	Traverse	320 986 2013
Runestone TelCo	Dial Up	DSL		Hosting	Wendell	Grant	320 986 2013
Rural Cell Comm	Dial Up				Alexandria	Douglas	320 762 2000
Rural Cell Comm	Dial Up		Wireless		Glenwood	Douglas	320 762 2000
Rural Link	Dial Up			Hosting	Boyd	Douglas	320 848 6611
Rural Link	Dial Up			Hosting	Clarkfield	Yellow Medicine	320 669 7177
Sacred Heart Telco	Dial Up	DSL			Sacred Heart	Renville	320 765 2235
Starbuck TelCo		DSL			Starbuck	Pope	320 239 2211
TDS Telcomm	Dial Up			Devel, Host	Broten	Pope	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Danube	Renville	800 434 2121
TDS Telcomm	Dial Up	DSL		Devel, Host	Eagle Bend	Douglas	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Kerkhoven	Swift	800 434 2121
TDS Telcomm	Dial Up	DSL		Devel, Host	Miltona	Douglas	800 434 2121

TDS Telcomm	Dial Up			Devel, Host	Murdock	Swift	800 434 2121
TDS Telcomm	Dial Up	DSL		Devel, Host	New London	Kandiyohi	800 434 2121
TDS Telcomm	Dial Up	DSL		Devel, Host	Osakis	Douglas	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Parkers Prairie	Douglas	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Pennock	Kandiyohi	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Sedan	Pope	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Spicer	Kandiyohi	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Sunberg	Kandiyohi	800 434 2121
TDS Telcomm	Dial Up			Devel, Host	Terrace	Pope	800 434 2121
TDS Telcomm	Dial Up	DSL		Devel, Host	Urbank	Douglas	800 434 2121
TDS Telcomm	Dial Up			Hosting	Villard	Pope	800 434 2121
Valley TelCo	Dial Up				Browns Valley	Traverse	320 695 2111
Wheaton Area High School	Dial Up			Hosting	Wheaton	Traverse	320 563 8282

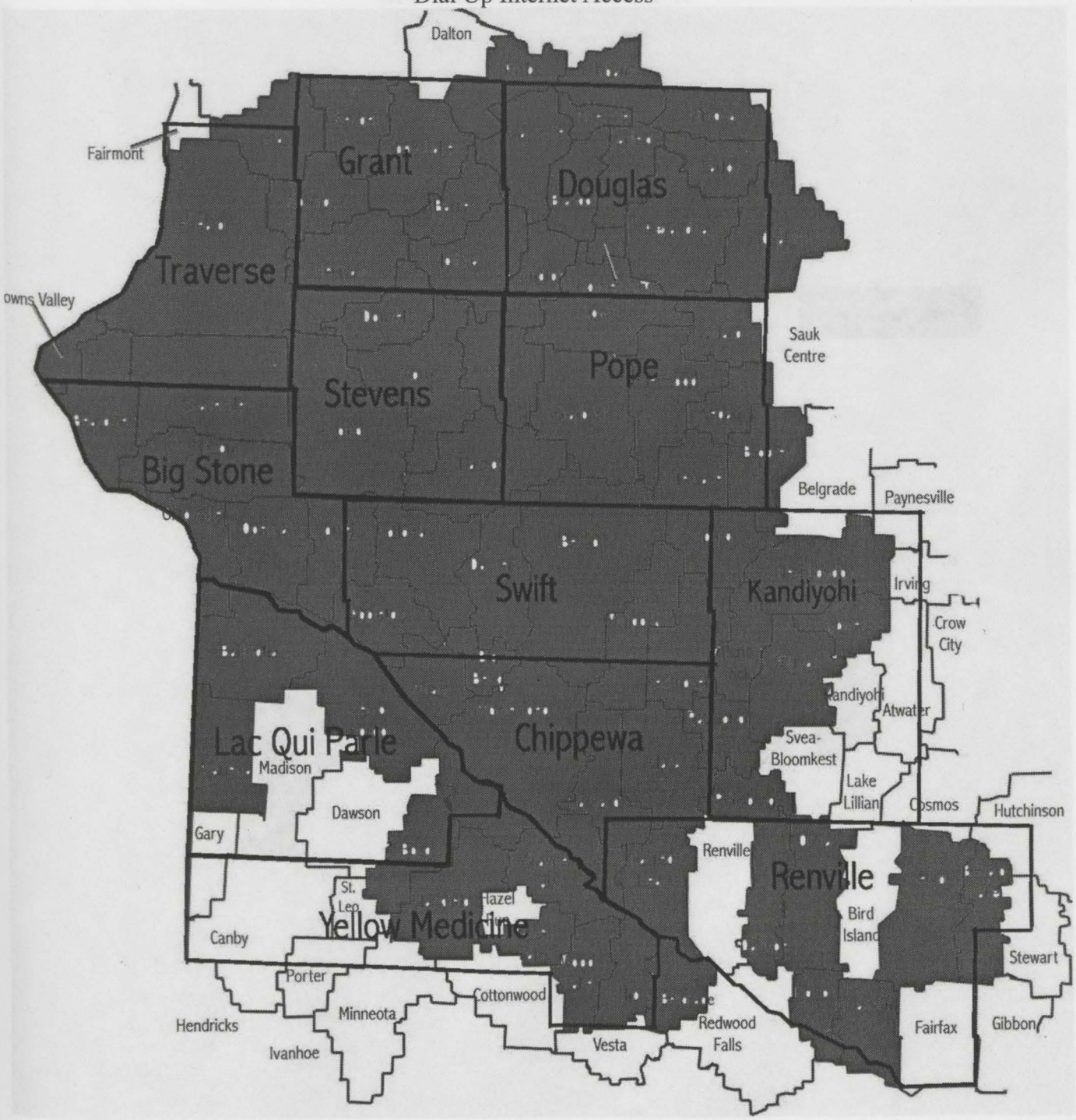
Appendix D

Internet Service Provider Maps

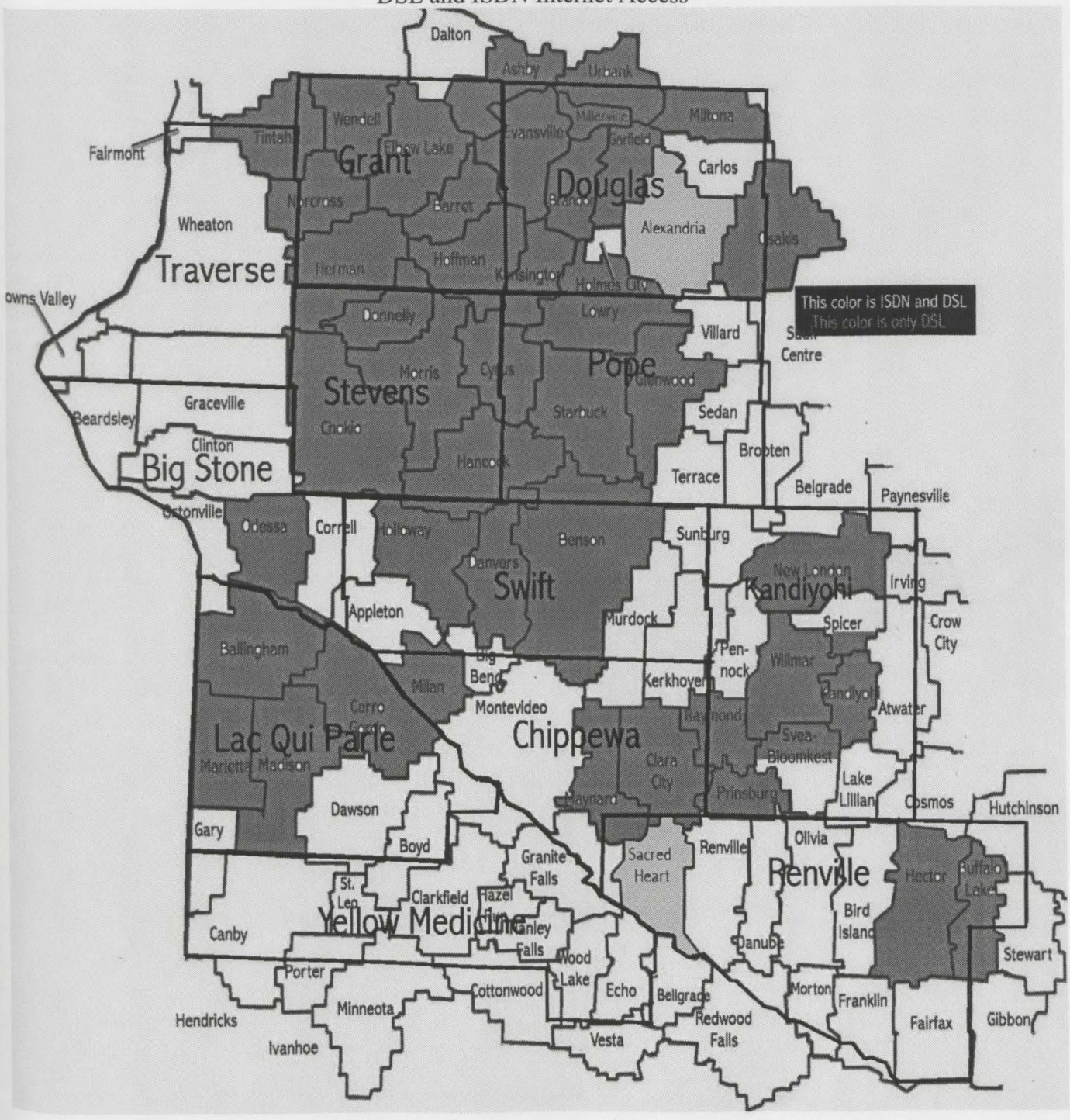
The Twelve Counties and the fiber optic cable running through them

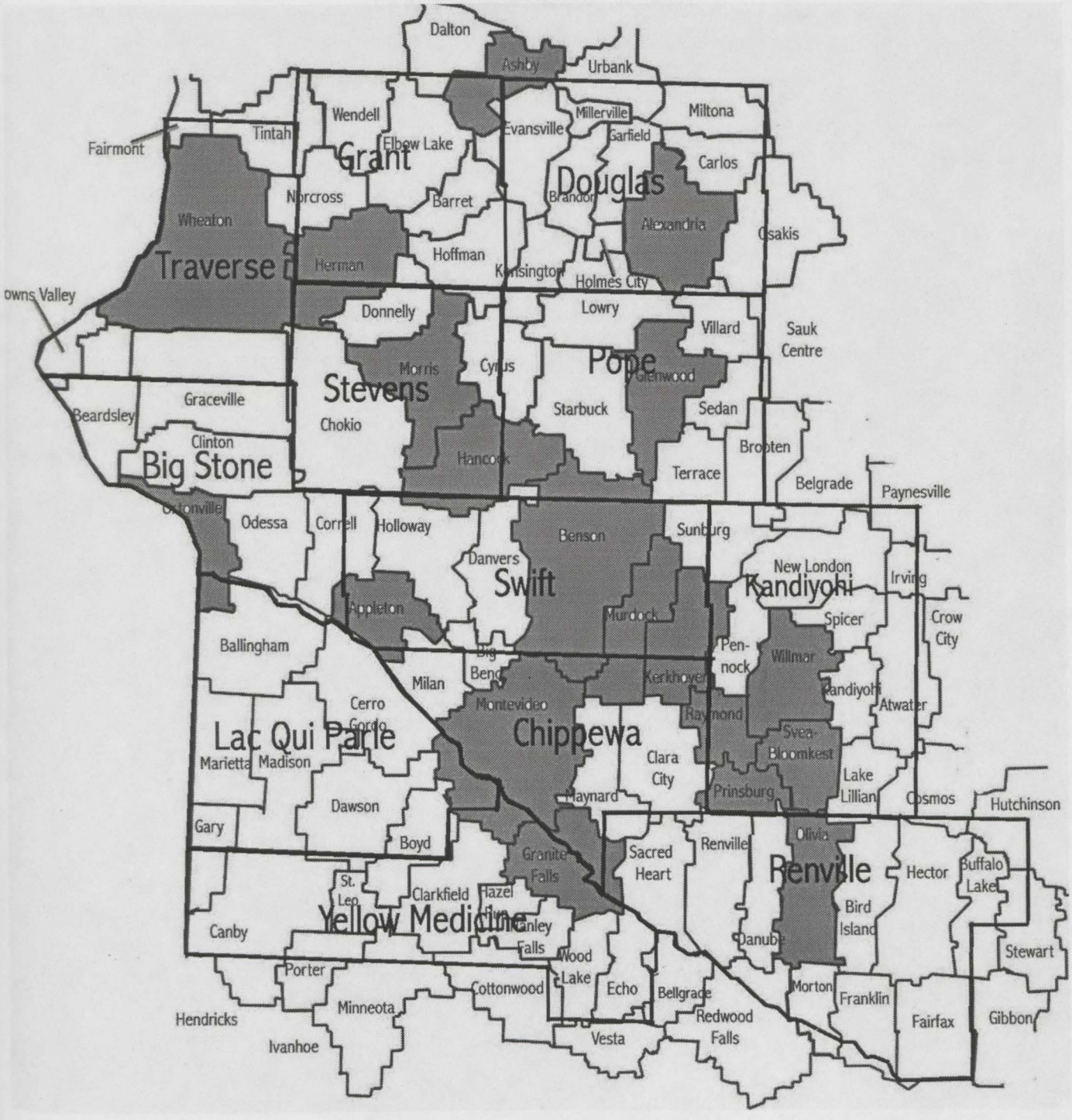


Dial Up Internet Access



DSL and ISDN Internet Access



Cable Modem Internet Access

Wireless Modem Internet Access