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August 2003

2003 Rural Minnesota Internet Study

Tracking the rise of broadband use in Greater Minnesota households

As broadband providers continue to deploy telecommunications technology throughout Minnesota, concern regarding the geographic access to broadband is quickly being replaced with concerns regarding consumer demand and adoption rates by both small businesses and residential customers. Such concerns appear to be warranted. As documented last year in our 2002 rural business survey jointly released with Minnesota Technology Inc.,¹ utilization of broadband services was strongly correlated with the size of the firm. Simply put, most large firms have it and most small firms don't.

Similarly, in regard to residential demand in rural Minnesota, our 2002 household survey² clearly documented the important influence of age and income on the adoption of computer, Internet and broadband technologies (broadband includes DSL, cable, satellite and other high-speed technologies). In those findings households with higher incomes and younger families were much more likely to adopt these new technologies than those with lower incomes, or those 65 and older.

Access to and adoption of Internet and broadband technologies by residents is particularly important to businesses in rural Minnesota, largely because of the economies of scale and fixed costs involved in providing telecommunications services. In densely populated areas where there are enough business customers purchasing services to create an affordable market, the issue is practically invisible. In rural areas, fewer businesses within a service area mean fewer customers to cover a provider's fixed costs, and as a result, businesses find telecommunications services less affordable. Residential customers in these areas are often looked upon as a means of enlarging the purchasing pool, making the provision of services more cost effective for providers and more affordable for customers.

Initiated in 2001, the Rural Minnesota Internet Study is an annual survey designed to monitor Internet access, market penetration and technology utilization in rural Minnesota.

The Center for Rural Policy and Development, based in St. Peter, Minn., is a private, not-for-profit policy research organization dedicated to benefiting Minnesota by providing its policy makers with an unbiased evaluation of issues from a rural perspective.

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Like the 2002 survey, this year's study will have three components:

- A survey of randomly selected rural Minnesota households to better understand rural residents' use of and orientation toward the Internet;
- A survey of randomly selected rural Minnesota businesses to better understand their needs and utilization of digital technology;
- A survey of telecommunications providers that conduct business in rural Minnesota to monitor the deployment, market penetration and pricing of telecommunications services.

This report documents the findings from the residential survey. The survey was conducted via telephone interviews using randomly selected phone numbers (random digit dialing) from telephone exchanges outside of the Twin Cities seven-county metropolitan area. The data was collected between mid-May and early June, 2003. A total of 642 rural residents were interviewed for the study. Core geographic and demographic characteristics of the respondents were then compared with Census data to ensure that the sample was representative of Minnesota households located outside of the Twin Cities seven-county area. Finally, the data was analyzed using SPSS statistical software; the estimates generated have a tolerated margin of error of $\pm 4\%$.

A quick look at the major findings of the study conclude that ...

- Growth in the overall number of people owning home computers and connecting to the Internet is substantially up from 2002. Ownership of a home computer in rural Minnesota was estimated at 65% in 2003, up from 60% in 2002. And of those who reported owning a home computer, 88% report being connected to the Internet, up from 78% in 2002.
- Of those households reporting that they are connected to the Internet, the shift from dial-up to broadband has continued at a brisk pace. In 2001 13% of rural Minnesotans online reported using a broadband connection. This percentage increased to 21% in 2002 and 27% in 2003. We are now

estimating that 15% of all Minnesota households outside of the seven-county Twin Cities metro are purchasing a broadband service.

- The market penetration of broadband services outside of the seven-county metro area appears to be greatest in southern Minnesota (area code 507 and a small part of the 651 area code), where 19.8% of all households queried reported having a broadband Internet connection. This compares to 11.9% in northern Minnesota (area code 218) and 12.5% in central Minnesota (area code 320 and a portion of the 763 area code).
- Rural residents are reporting average monthly prices of \$18.62 for dial-up service and \$40.90 for broadband service. However, almost one in five dial-up customers (19%) report purchasing a separate access line for their Internet connection. For these dial-up users, their average combined monthly Internet bill is \$41.96.
- Approximately half (49.4%) of all households reporting a dial-up connection in their home also reported that they have tried a broadband connection before. Approximately one in four (27%) report having tried a broadband connection at work; 15% report using a broadband connection at a friend or relative's home; and the remainder reported trying a broadband connection somewhere else. Still, 50.6% of dial-up users reported never having experienced a broadband connection, a figure only slightly down from 55% in 2002.
- Product differentiation between dial-up and broadband is beginning to be observed in the activities of Internet users. In 2003, broadband users reported to be much more likely than dial-up users to make Internet purchases, use their Internet connection for work-related activities, download music or video files, or play online computer games. Such differences were also observed in 2002, but the magnitude of the differences reported was much greater in 2003.
- Lastly, age and income still appear to be the greatest predictor of computer ownership, Internet connectivity and broadband adoption. Those

households that reported lower incomes or being over 65 years of age were substantially less likely to report owning a household computer or utilizing digital technology.

2003 Rural Minnesota Internet Study Findings

Technology Adoption

Among the 642 respondents, 65% reported having at least one working computer in their home, and of those, 88.5% reported being connected to the Internet. These numbers are up significantly from 2002, when only 60% of households reported owning a computer, and among those, 78% reported being online. Accordingly, we estimate that 57.5% of households outside of the Twin Cities metro area are currently connected to the Internet, up from 46% in 2002.

How Greater Minnesota Connects

When asked how they connect to the Internet, 72% reported that they use a dial-up connection, while 27% reported connecting with a broadband connection. These findings represent a significant increase in broadband adoption among Internet users, as only 21% of on-line households reported using a broadband connection in 2002 and 13% in 2001. Accordingly, we are now estimating that 15% of all Greater Minnesota households are going online with a broadband connection.

According to the PEW Internet & American Life Project,³ these numbers are slightly below the national average: their 2003 survey estimated that 30% of American households connecting to the Internet do so with a broadband connection. Consequently, the PEW study estimates that 16% of all American households now purchase a broadband connection.

	Own a computer?	Connected to the Internet?
2003	65.0%	57.5%
2002	59.0%	46.0%
2001	60.0%	46.0%

Table 1: The percentage of rural households saying they owned a computer and are connected to the Internet were both up in 2003.

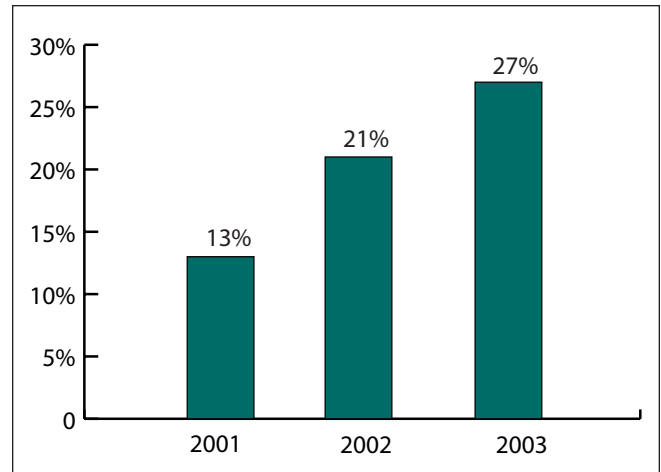
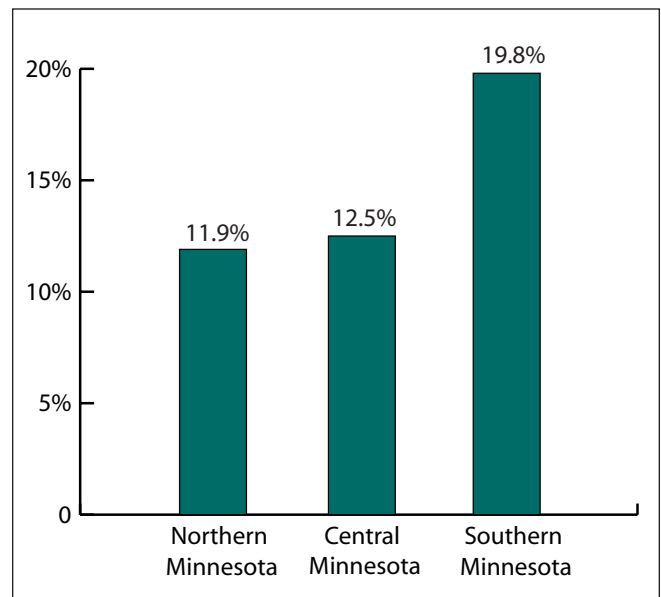


Figure 1: Broadband usage among rural Internet users has increased steadily since the survey was started.

Figure 2: Broadband usage among all households in rural Minnesota varied by region.



For the first time in 2003, we attempted to examine the market penetration of broadband services across various regions in Greater Minnesota. To do this we defined northern Minnesota as the entire 218 area code; central Minnesota as the entire 320 area code and part of the 763 area code; and southern Minnesota as the entire 507 area code, along with a small part of the 651 area code.

The analysis revealed some substantial differences across regions. In northern Minnesota 21.7% of those online reported having a broadband connection, compared to 22.9% in central Minnesota and

32.5% in southern Minnesota. Extrapolating to all households, the data suggests that 11.9% of all northern Minnesota households, 12.5% of all central Minnesota households; and 19.8% of all southern Minnesota households are now purchasing broadband services.

(It is important to recognize in this analysis that as our sampling framework was designed to be representative of all of Greater Minnesota, our estimates in such a regional analysis, while not biased, will have significantly greater tolerated margins of error. Consequently, while such estimates are informative of overall regional trends, they should be interpreted with greater caution.)

Broadband Awareness & Orientation

General awareness of broadband availability among dial-up users does not appear to have changed in the past year: 52% reported that a broadband service was available in their area; 23% reported that broadband was unavailable; and 25% reported that they did not know if broadband was available. These numbers were virtually identical to results in the 2002 survey.

However, in 2003 a slightly greater percentage of dial-up users reported having tried a broadband connection. Specifically, when asked if they ever tried a broadband connection, 49% reported that they had, up from 45% in 2002.

When dial-up users were asked why they had not yet purchased a broadband connection, 40% reported that it was simply too expensive, while 28% reported that they did not use the Internet enough to justify purchasing broadband services. In a related question, 22% of dial-up users reported that they were happy with their dial-up connection and not interested

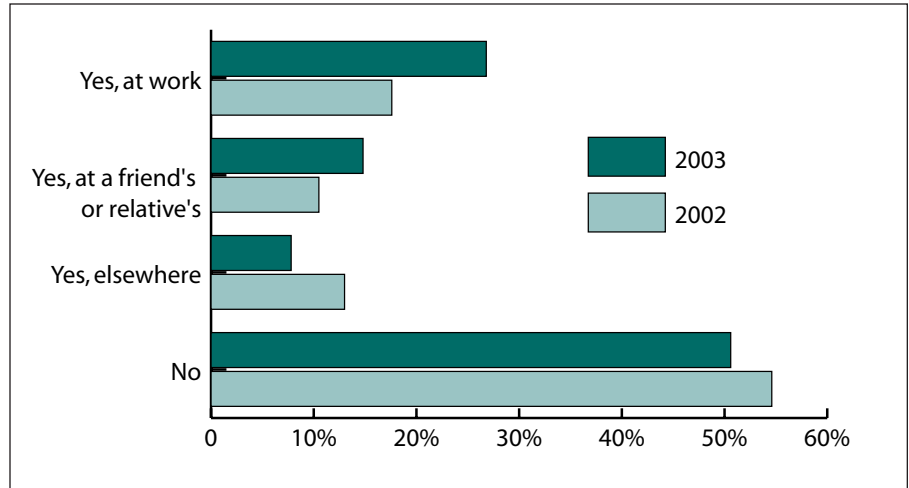


Figure 3: The percentage of dial-up users who said they have tried broadband increased between 2002 and 2003.

in purchasing broadband services. This figure is encouraging, however, because it is down noticeably, from 31% in 2002 and 55% in 2001, showing an increasing interest among residential users.

As noted above, price still remains the greatest barrier to broadband adoption for many dial-up users. When asked how much they would be willing to pay per month for broadband services, 41% reported \$30 or less. Almost one in four dial-up users were uncertain how much they would be willing to pay; and as mentioned above, 22% simply stated that they were satisfied with their dial-up connection and were not interested in broadband services.

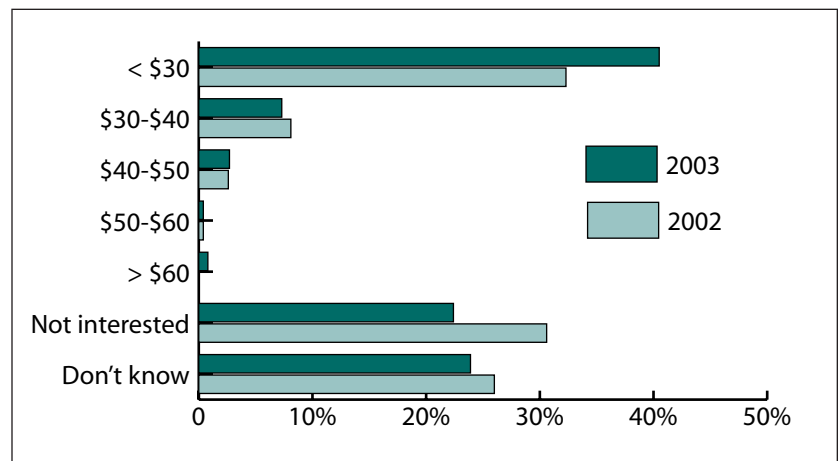


Figure 4: In 2003, more dial-up users said they would purchase broadband at \$30 or less, but fewer said they were not interested, compared to 2002.

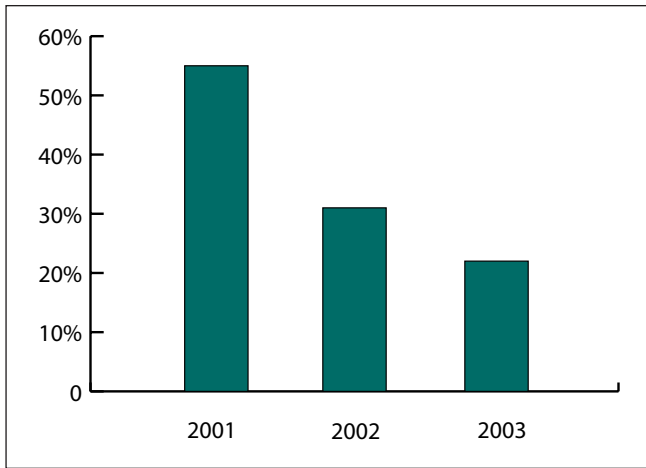


Figure 5: The percentage of dial-up users saying they are not interested in trying broadband at all has decreased steadily, from 55% in 2001 to 22% in 2003.

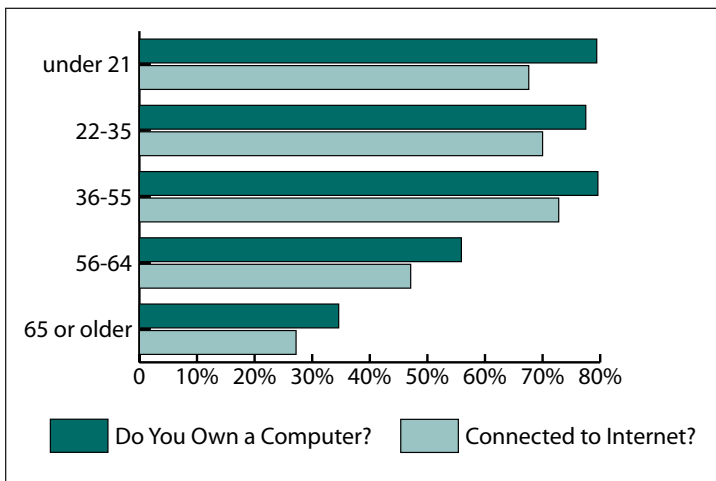
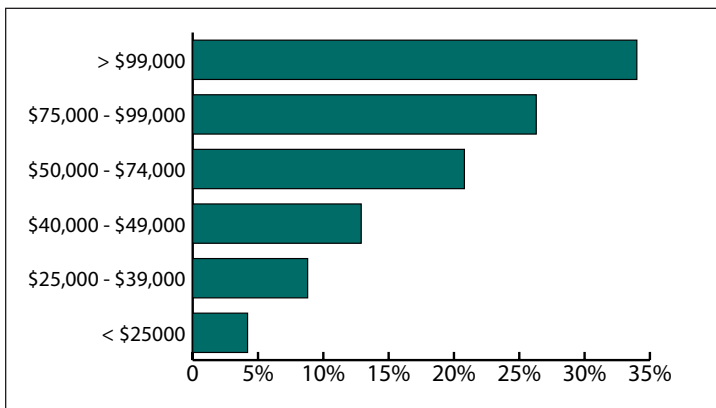


Figure 6: Computer ownership and Internet access vary greatly depending on age.

Figure 7: Broadband purchase is also strongly correlated to income. Fewer than 5% of people with income under \$25,000 purchase broadband for their homes.



Demographic Influences

In the 2002 study, both age and income were strong predictors of computer ownership, Internet connectivity and broadband adoption. Specifically, those respondents reporting to have lower incomes, as well as those who were 65 or older, were much less likely to own a home computer, be connected to the Internet, or purchase a broadband service. Not surprisingly, these factors are still prominent today.

Almost 80% of those respondents who were 55 years of age or younger reported owning a home computer, while only 55% of those age 56-64 and 35% of those 65 and over reported owning a home computer. Similar differences were discerned when we asked about Internet connectivity, as well as the use of broadband services.

When we examined the influence of household income, we found that 86% of those with household incomes of \$99,000 or greater reported owning a home computer; 80% were connected to the Internet and 34% had a broadband connection. On the other hand, among those with household incomes of \$25,000 or less, only 31% reported owning a home computer, 24% were connected to the Internet, and 4.2% purchased a broadband connection.

Online Activities

Those respondents who reported having an Internet connection were asked how much time they spend online each week, in addition to information regarding the types of activities they engage in online. The amount of time Internet users reported spending online was up in 2003, to an average of 13.9 hours online per week compared to 11.0 hours per week in 2002, a 26-percent increase. However, broadband users reported spending significantly more time online than dial-up users, 20.6 hours compared to 11.5 (see Table 2).

To look at time spent online in a different way, in 2002, 64% of broadband users and 73% of dial-up users were online for 10 or fewer hours per week. However, in 2003, while 69% of dial-up users reported being online 10 or fewer hours per week, only 43% of broadband users reported likewise, showing that they were indeed spending more time online on average.

Internet users were also given a list of online activities and asked which, if any, they had engaged in within the last six months. Not surprisingly, sending and receiving email (98%), surfing the web for fun (85%), checking the weather (79%), and researching medical information (65%) were the most common responses. Other responses of interest included: playing computer games online (58%), downloading music or video files (43%), doing work for your employer (36%), searching for a new job online (29%) and taking an online high school or college class for credit (9%).

Similar to the question regarding time spent on line, differentiation between dial-up and broadband users was more discernable in 2003. In general, broadband users consistently reported a much greater engagement in virtually all of the online activities compared to dial-up users. Some of the activities where both groups were close to being equal were in sending and receiving email (an almost universal Internet activity), visiting a travel site, checking agricultural commodity prices and taking an online class for credit.

Those online activities that most differentiated broadband users from dial-up users were: downloading music or video files (62% of broadband users vs. 36% of dial-up users); doing work for your employer (51% vs. 31%); reading an online newspaper (70% vs. 51%); making online purchases to save money (47% vs. 28%); researching personal finance (56% vs. 37%); and playing computer games online (71% vs. 54%).

	All users	Dial up	Broadband
Average hours per week spend online	13.9	11.5	20.6

Table 2: Average hours per week spent online for all users, dial-up and broadband users.

Table 3: Percentage of users who engage in selected online activities.

	Both groups	Dial up	Broadband
Email	98.4%	97.7%	100.0%
Surfing for fun	85.1%	83.8%	88.8%
Checking weather	79.3%	75.5%	89.8%
Research medical information	64.9%	63.0%	70.4%
Play computer games online	58.4%	54.3%	71.4%
Research price of a large purchase	58.2%	55.5%	66.3%
Read a newspaper online	55.4%	50.6%	70.4%
Visit a travel site	54.9%	54.7%	57.1%
Buy something that can't be had locally	53.3%	49.1%	64.3%
Use a chat room or instant messaging	49.5%	45.7%	60.2%
Download music or video files	42.7%	35.5%	62.2%
Research personal finance	41.6%	36.6%	56.1%
Buying something online for convenience	39.4%	36.6%	46.9%
Doing work for employer	36.4%	30.6%	51.0%
Buy something online because its cheaper	33.4%	28.3%	46.9%
Search for new job	29.1%	26.8%	35.7%
Bid at an online auction	23.1%	21.1%	28.6%
Earn money with computer	11.4%	7.9%	21.4%
Check ag prices	10.1%	10.2%	10.2%
Trade stocks online	9.0%	6.4%	16.3%
Take online class	8.7%	8.7%	8.2%

Summary and Conclusions

The 2003 Rural Minnesota Internet Study gives Internet advocates reason to be optimistic since the findings suggest that more and more residents outside the Twin Cities metro area are adopting the digital tools the 21st Century brings. The findings document that 65% of Greater Minnesota households now own a personal computer (up from 60%); that 57.5% are connected to the Internet (up from 46%); and that 27% of Internet users (15% of all households) are going online with a broadband connection.

Further, 2003 data from the national PEW Internet and American Life Study suggests that Greater Minnesota is closely in line with broader national estimates of Internet access and utilization. Specifically, the PEW study (April-May 2003) reports that 58% of American households are connected to the Internet and that 16% of households nationwide access the Internet with a broadband connection. Compare that to this study's finding that 57.5% of Greater Minnesota households were online and that 15% connected with a broadband connection. Such parallel findings support our study, but also should help relieve the concerns of those who worry about Greater Minnesota falling behind in its adoption of digital technology.

Most impressive this year was the rise in broadband utilization among Internet users, from 13% in 2001 to 21% in 2002 to 27% in 2003. This represents a 26-percent increase in the past 12 months and a 108-percent increase across the two-year time period. Further, awareness and access to broadband services continues to increase, as more than half of the dial-up users in the survey reported that they have now experienced using a broadband connection, either at work, at a friend's home or somewhere else (e.g., the public library). And slightly more than half of the respondents reported that they had access to broadband services in their local service area and could purchase it if they chose to. Clearly, progress is being made.

Price, however, appears more and more to be the primary barrier to broadband adoption. While the average \$41 monthly broadband cost reported in 2003 is down from \$49 in 2002, it is still far from the critical price point that dial-up users reported being willing to pay.

The data also suggests that there are significant differences within Greater Minnesota in its adoption of computer, Internet and broadband technologies. Specifically, southern Minnesota households reported a significantly higher percentage of computer ownership and broadband connectivity compared to central or northern Minnesota.

As mentioned earlier, care must be taken not to over-interpret such regional differences, as the margins of error for such analyses are considerably larger than those for the state estimates. However, it is equally true that respondents from northern Minnesota were somewhat older on average and respondents in southern Minnesota were considerably more affluent than those in other regions. Such demographic and socio-economic characteristics are likely in large part the cause of the regional differentiation, as the study continues to suggest that age, price and household income are major factors influencing technology adoption. Consequently, it is clear that if residents in Greater Minnesota continue to both age faster and have lower incomes than their metro counterparts, then the adoption of digital technology will inevitably slow and begin to lag significantly in Greater Minnesota.

Lastly, the study indicates that product differentiation between broadband and dial-up technologies is beginning to appear. In 2002, when both dial-up and broadband users were asked how many hours each week they went online, as well as the types of online activities they engaged in, the differences between the two user-types were slight. However, the 2003 survey clearly suggests that broadband users not only spend more time connected to the Internet, but are engaged in a wider array of online activities. This is especially true for those who regularly download music and video files, seek information via online newspapers, and conduct work-related activities at home for their employers. For these activities the difference was 20 percentage points or more between broadband and dial-up users.

This finding is exceedingly important, as it is the act of product differentiation by residential consumers that will ultimately drive the demand for broadband services. When consumers recognize that access to their desired online content or online activities can



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only be provided through a broadband connection, then migration to broadband services will greatly increase. An analogy would be the differentiation that occurred in the cable television industry a few decades ago, when consumers recognized that access to desired content such as ESPN and HBO was only accessible through these new cable connections. Similarly, as content providers place more and more broadband applications on the Internet and consumers are better able to differentiate the utilization between broadband and dial-up technologies, then the adoption curve will truly accelerate.

Endnotes:

¹ Center for Rural Policy and Development and Minnesota Technology Inc., “2002 Rural Minnesota Internet Study: Examining the telecommunications needs of Greater Minnesota companies,” September 2002.

² Center for Rural Policy and Development, “2002 Rural Minnesota Internet Study: How rural Minnesotans are adopting and using communication technology,” July 2002.

³ PEW Internet & American Life Project, Adoption of Broadband to the Home, May 2003, www.pewinternet.org.