



# CENTER *for* RURAL POLICY *and* DEVELOPMENT

February 2005

## *2004 Rural Minnesota Internet Study: Monitoring the rise of broadband use in Greater Minnesota households*

### *Introduction*

The Rural Minnesota Internet Study is an annual survey of rural Minnesota households and businesses that monitors Internet access, broadband market penetration and technology utilization in rural Minnesota. Now in its fourth year, the residential component of the study closely examines the technology adoption behavior of rural Minnesota households, as well as the utilization of Internet technology.

As we have noted in the past, concern regarding the *demand* and *adoption* of broadband technology by rural businesses and households appears to be overtaking previous concerns about *access* to broadband technology. This shift appears to be warranted: our most recent provider study, released in April 2004, documented that 85 percent of the 780 rural markets examined reported having access to at least one broadband provider. Further, those rural communities that still do not have access to broadband technology tended to be quite small, with the average population being less than 350 residents. However, it is also important to note that while our study provided good information regarding those living within incorporated towns and cities throughout rural Minnesota, much less is known about the accessibility of broadband technology among those residing in the rural countryside.

This installment of the Rural Minnesota Internet Study documents the findings from the 2004 residential survey. The survey was conducted via telephone interviews using randomly selected telephone numbers (i.e., random-digit dialing) outside of the seven-county metropolitan area. The data were collected in November 2004, yielding a total of 702 completed responses. Core geographic and demographic characteristics of sample respondents were then compared

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*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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to the most current Census data to ensure that the sample was representative of Minnesota households located outside of the Twin Cities metro. Finally, the data were analyzed utilizing SPSS statistical software, with the generated estimates having a tolerated margin of error of  $\pm 4\%$ .

### *A quick look at the major findings concludes that ...*

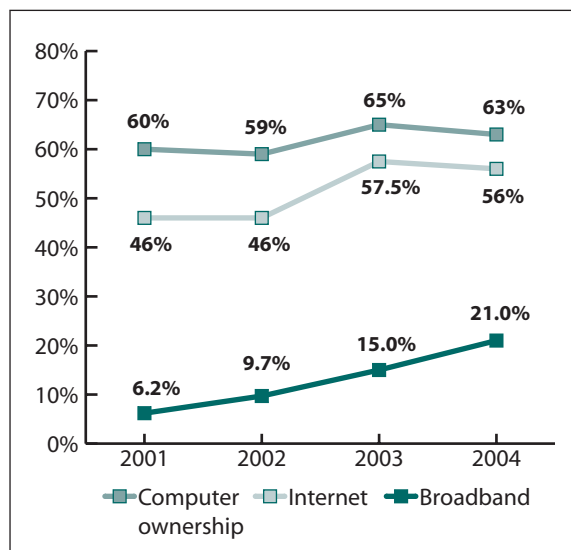
- Growth in the overall number of rural households that reported owning a home computer or have Internet connectivity appears to be flat, while growth among those households switching from a dial-up Internet service to a broadband service seems to be quite robust. Based upon these findings we are now estimating that one-third (34%) of all rural Internet users and one-in-five (21%) of all rural households now subscribe to a broadband service.
- While growth in market penetration of broadband service was documented in all regions of the state, the growth is greatest in southern Minnesota, where 28.8 percent of all households now have a broadband connection. Conversely, northern Minnesota lags behind the rest of rural Minnesota with 15.3 percent of households subscribing to a broadband service.
- Among those households that report having a broadband connection, cable modem appears to be significantly outpacing DSL or wireless services. This is true in southern and central Minnesota, but not in northern Minnesota, where DSL is outpacing all other broadband technologies.

- The average reported price for broadband service in rural Minnesota has dropped 8.5 percent, from \$40.90 in 2003 to \$37.45 in 2004. However, dial-up customers still report that prices would have to drop below \$30 before a majority of these users would switch to a broadband service.
- Finally, socio-demographic factors such as age, income, or whether school-age children are in the home are extremely good predictors of computer ownership and Internet connectivity, as well as broadband adoption.

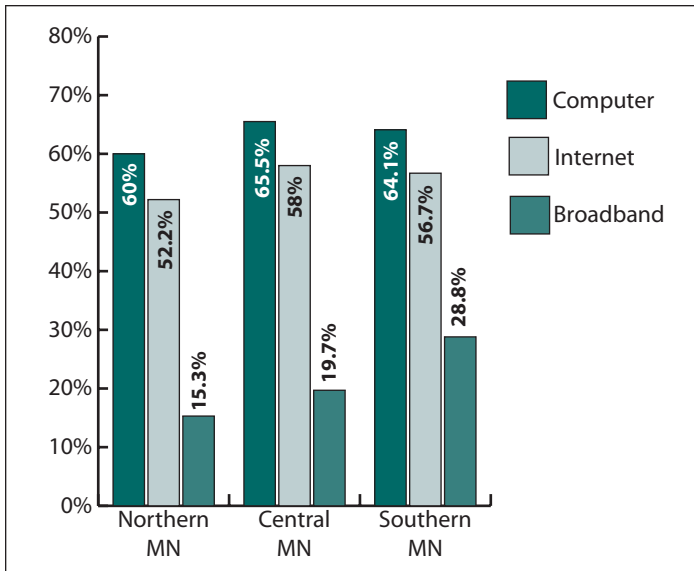
### *Findings from the 2004 Study:*

#### *Rural Minnesota gets online*

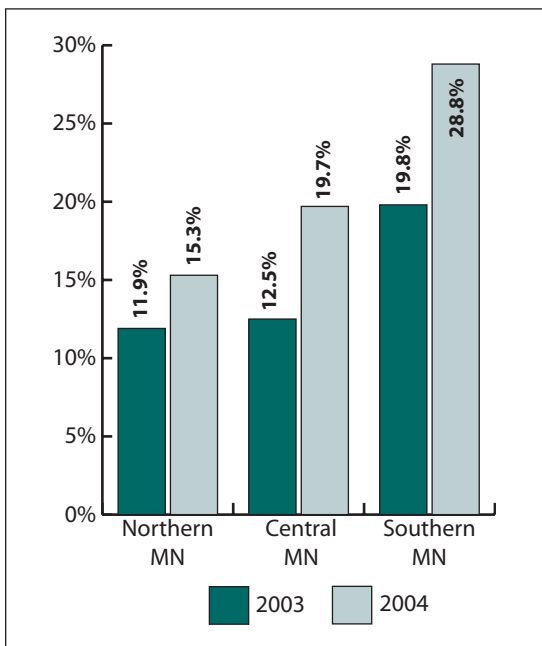
Figure 1 documents the four-year trend lines for computer ownership, Internet connectivity and broadband adoption among rural Minnesota households. As one can see, growth in both computer ownership and Internet connectivity appears to be flat between 2003 and 2004. The 63-percent computer ownership and the 56-percent Internet connectivity reported are both



*Figure 1: Change in percentage of population who own computers, are connected to the Internet and use broadband, 2001-2004.*



**Figure 2:** Computer, Internet and broadband adoption by region.



**Figure 3:** Change in broadband demand by region.

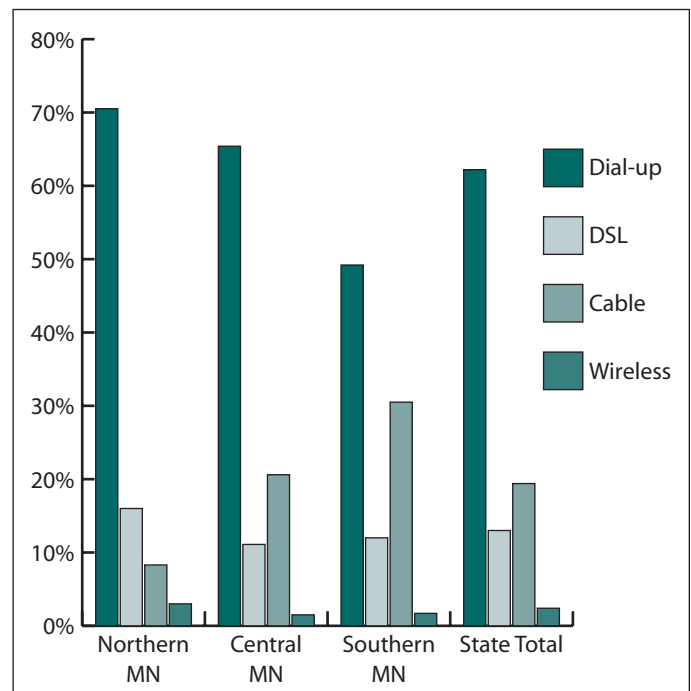
numbers well within the 4-percent statistical margin of error, suggesting that no growth in these measures can be statistically discerned. However, the demand for broadband appears to still be growing robustly, increasing from 15 percent of all household in 2003 to 21 percent in 2004.

According to the Pew Internet and American Life Project estimates, 16 percent of American households subscribed to a broadband service in

2003, increasing to 24 percent in 2004. Our estimates suggest that broadband adoption in rural Minnesota is still slightly behind the national average, but the extent of this “lag” varies significantly from region to region, as Figure 2 shows.

As the chart shows, northern Minnesota consistently lags the rest of the state in reported home computer ownership and Internet connectivity, but the lag is quite significant when examining the adoption of broadband, where only 15 percent of northern Minnesota households report subscribing to a broadband service. This is well below the 20 percent broadband adoption rate found in central Minnesota and almost half the 29 percent reported in southern Minnesota.

Figure 3 documents the growth in broadband subscriptions from 2003 to 2004. As one can see, the demand for broadband increased in all regions of the state, with northern Minnesota recording the smallest increase, from 11.9 percent in 2003 to 15.3 percent in 2004, and southern Minnesota



**Figure 4:** Adoption rates for various Internet connection technologies by region.

recording the largest increase, from 19.8 percent in 2003 to 28.8 percent in 2004.

Overall, dial-up service is still the most common way rural Minnesotans connect to the Internet, comprising 62 percent of all Internet connections statewide. Figure 4, however, shows the continuing decline in dial-up connections as people move to broadband. The shift is most dramatic in southern Minnesota, where we are now estimating that only half of those rural households online connect to the Internet with a dial-up connection, compared to 71 percent in northern Minnesota and 65 percent in central Minnesota.

The price of a home broadband connection in rural Minnesota dropped approximately 8.5 percent, from an average price of \$40.90 in 2003 to \$37.45 in 2004. However, as Figure 5 shows, these prices are still on average \$13 higher than the average price dial-up users report as the price where they would definitely switch to a broadband connection.

Respondents who reported having a dial-up Internet connection were also asked why they have not yet switched to a broadband service (Figure 6). While they provided a wide variety of reasons, it is clear that the two primary reasons are price (39.4%) and very modest utilization of the Internet (26.5%).

### Socio-demographic realities

Figures 7-9 document the strong influences age, income and life-cycle stage have in understanding factors that affect technology adoption. Our studies in the past have strongly suggested that these socio-demographic factors

are powerful predictors of adoption behavior, and data from the 2004 survey clearly reaffirms the importance of these factors. As Figure 7 shows, while over 90 percent of households with annual incomes over \$99,000 report owning a home computer, less than half of households with annual incomes under \$39,000 report likewise. Similar trends are found regarding Internet connectivity and, of course, broadband adoption.

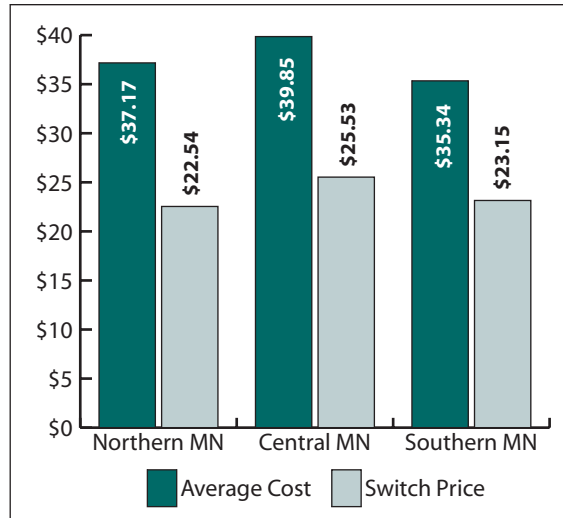


Figure 5: Difference by region between the price of broadband and what dial-up users are willing to pay.

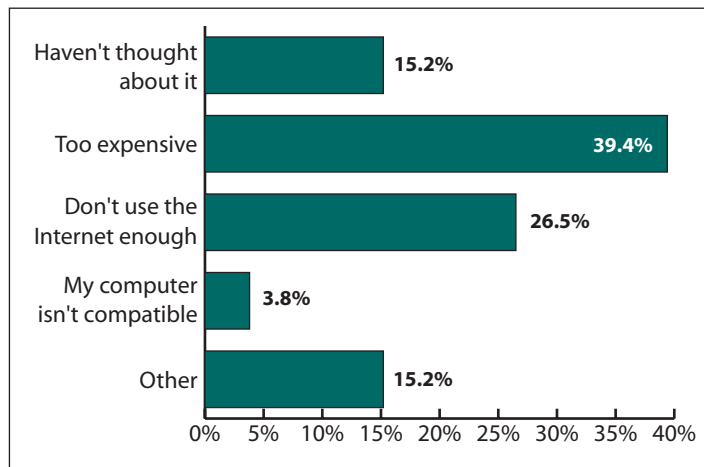


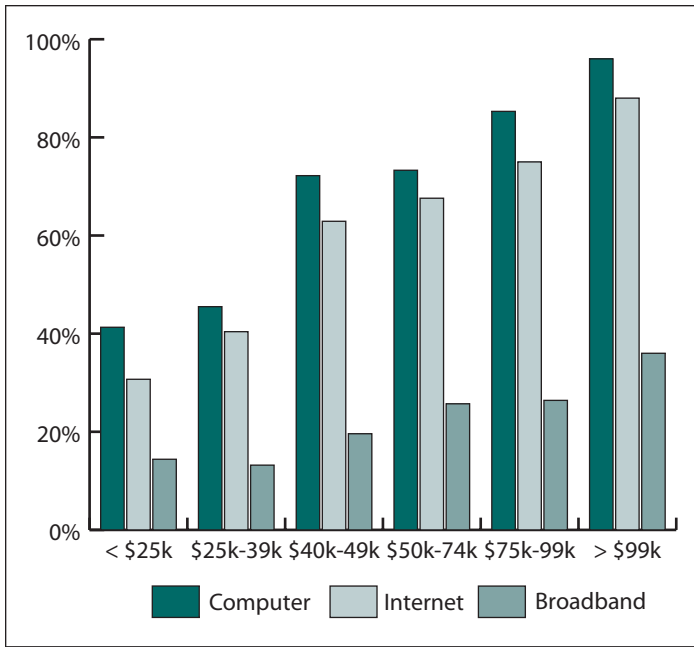
Figure 6: Reasons given by dial-up users for not switching to broadband.

### Figure 8

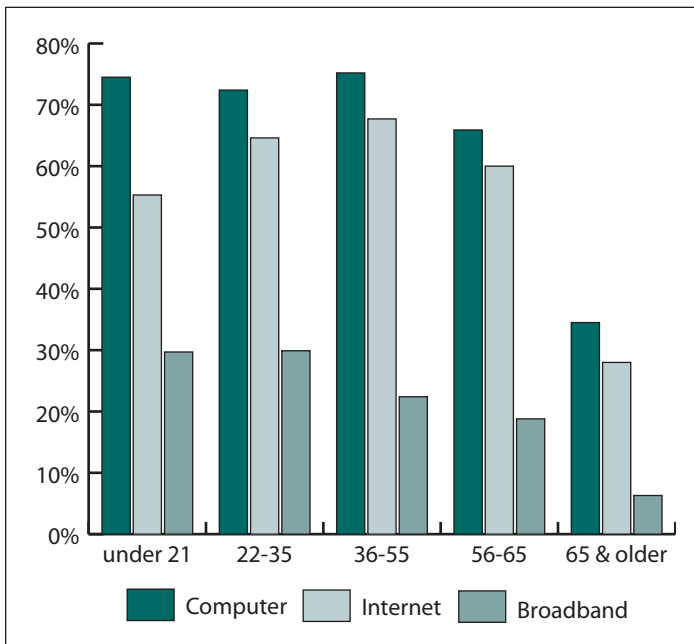
documents the influence of age on technology adoption. As one can see, rural residents that are 65 or older report adoption rates that are less than half of the rest of the rural population. Further, those rural residents who are both low income and elderly have the lowest adoption rates,

with only 20 percent reporting that they own a home computer and only 2 percent reporting that they subscribe to a broadband service.

Conversely, Figure 9 examines the impact on technology adoption of having school-age children in the home. As the chart shows, 82 percent of rural households with school-



**Figure 7:** Differences in computer, Internet and broadband adoption by income.



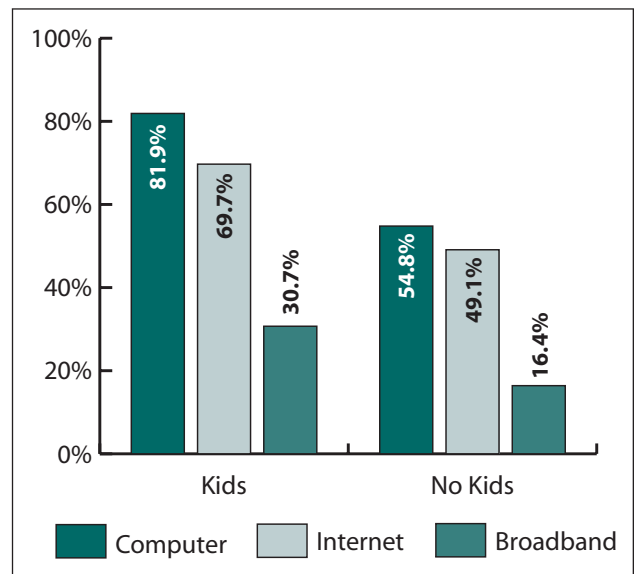
**Figure 8:** Differences in computer, Internet and broadband adoption by age.

age children report having computers in the home, with close to one-third of them (30.7%) subscribing to a broadband service. Adoption is much lower among the remaining households, those without school-age children, where only 55 percent reported owning a home computer and 16

percent reported subscribing to a broadband service.

**Discerning product differentiation**

During earlier years of the Rural Minnesota Internet Study, it was often noted that while a few innovative individuals were adopting broadband technologies, Internet use and behavior were remarkably similar among both broadband and dial-up users. In other words, broadband users were accessing and using the Internet no differently than dial-up users except



**Figure 9:** Differences between homes with school-age children and without in computer, Internet and broadband adoption.

that they were doing it with greater speed and convenience. However, beginning in 2003 we began to notice that the utilization behavior and patterns of broadband and dial-up users were beginning to diverge.

In 2004, it appears that this divergence continues to widen, with broadband users reporting that they spend almost twice as many hours online as dial-up users (17.5 hours per week vs. 9.3 hours per week). Further, when examining specific Internet activities (such as downloading music files or paying household bills online), it is clear that we are continuing to discern greater

and greater differentiation between dial-up and broadband users. Table 1 examines a variety of Internet activities and the frequency in which respondents report engaging in such activities.

## Summary and Conclusions

The 2004 Rural Minnesota Internet Study gives rural broadband advocates a strong reason to be optimistic. It is clear that rural Minnesotans continue to adopt broadband technology in significant numbers, and growth rates since 2003 continue to be strong. However, with that said, the ability to examine the data longitudinally over the last four years provides a unique perspective that allows for some longer-range insight:

- The first observation is that the four-year longitudinal data suggests that ownership of home computers among rural residents has flattened: this year's estimates of 63 percent are well within the survey's margin of error of last year's estimate of 66 percent. And in fact, this estimate is just a few percentage points above the 60-percent ownership rate first observed in 2001.

While the near-term market is flat, however, the picture for the long-term may be fundamentally different. Note that much of the reason for the flat market is the

disproportionately high percentage of low-income and elderly residents that reside in rural Minnesota. While it is not likely that most of our elderly rural residents will soon purchase home computers, as the years pass and the leading edge of the baby boomers replace the current elderly cohort, they will take their computer skills with them into their

senior years. Consequently, as the years pass, we anticipate that the current sizeable gap between the elderly cohort and the other age cohorts will continually and incrementally shrink.

- The second observation is that with almost 90 percent of all current home computers reported to be connected to the Internet, there is currently little room to grow. Therefore, future overall growth in Internet connectivity throughout rural Minnesota will have to be tied to either real population growth or growth in home computer ownership. There is little room to grow any other way.

- Thirdly, one has to be impressed with the extent that Internet behavior is differentiating depending up whether one is using broadband or dial-up. The findings not only suggest that broadband users are online almost twice as often as dial-up users, but they report engaging in Internet commerce and other types of Internet transactions at twice the rate of dial-up users. Needless to say, we predict that differentiation will continue to be observed and will likely increase at a rapid pace.

	Dial up	Broadband
Visit online travel site	42.1%	44.3%
Buy something online that's unavailable locally	45.5%	68.9%
Buy something online because it's cheaper	32.3%	51.5%
E-mail	94.9%	97.0%
Read online newspaper	40.0%	62.1%
Research medical information	53.6%	71.2%
Research personal finance	23.8%	41.7%
Download music/video files	17.9%	40.9%
Do work for employer at home	26.4%	47.7%
Place bid at auction site	20.9%	41.7%
Pay any household bills online	21.3%	44.7%
Instant message/chat room	31.1%	54.5%

**Table 1:** The percentage of Internet users reporting certain activities varied greatly depending on whether they used a dial-up connection or broadband.

**The 2004 survey showed that, as in 2003, broadband subscribers reported spending close to twice as many hours a week online as those who use dial up service, 17.5 hours compared to 9.3 hours respectively.**



- The fourth observation is simply that despite the flattening of both computer ownership and Internet connectivity, growth in broadband subscriptions throughout rural Minnesota continues to be robust and is growing unabated.

In fact, with current broadband penetration rates currently around 20 percent of all rural Minnesota households, it may be time to ask, “Are we at the tipping point?” By that we mean, as with any innovation (i.e., cell phones, fax machines, or microwave ovens) there comes a time when consumer awareness, understanding of that technology’s comparative advantage, and its market penetration are sufficient to no longer view a technology as “innovative,” but rather mainstream.

In his scholarly and seminal work *Diffusion of Innovations*, the late Everett Rogers suggested that this tipping point usually occurred after 15 to 20 percent of those who would eventually adopt a new technology adopted it. These technology pioneers were labeled by Rogers as “innovators” and “early adopters.” As more people became familiar with the new technology and were able to see its comparative advantages, its adoption curve would rise significantly and unit costs would decline, marking its transformation from an innovation to a mainstream technology.

Unfortunately, one can only discern this pattern and assess the “tipping point” after the fact, as a retrospective review and assessment. Consequently, one never really knows at the time whether they are at the “tipping point”— but it just may be appropriate to ask.

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