The EDA CENTER
at the University of Minnesota, Crookston

Minnesota Intelligent Rural Communities Project

Final Report

Prepared for the Blandin Foundation

Authored by: Jack M. Geller, Ph.D. & Eddie Walker, M.A.& M.S.

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University of Minnesota|Crookston

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Acknowledgements:

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The regional development organizations throughout the state played a vital role in establishing public awareness and media attention for the MIRC project and MIRC communities. They include the Northwest Regional Development Commission, East Central Regional Development Commission, Headwaters Regional Development Commission, Region Five Development Commission, Southwest Regional Development Commission, Upper Minnesota Valley Regional Development Commission, Region Nine Development Commission, West Central Initiative, Arrowhead Regional Development Commission, and the Mid-Minnesota Development Commission. And last but definitely not least, we want to thank the community leadership teams in the demonstration communities of Benton County, Cook County, Itasca County, Kandiyohi County, Stevens County, the Leech Lake Band of Ojibwe, Thief River Falls, Windom, Winona, Worthington, and the Upper Minnesota Valley region.

As a result of this remarkable collaboration, on November 1, 2012 the Blandin Foundation was awarded the 2012 Tekne Award in the category of Innovative Collaboration from the Minnesota High Tech Association.

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Table of Contents

I. Introduction and History of MIRC

"According to a June 2009 report by the Pew Internet and American Life Project, there was a significant (20%) gap between rural and urban home broadband adoption rates. While the rates of adoption have been increasing over time, this 20% gap has remained consistent since 2006. Results from a study conducted by the Minnesota Center for Rural Policy and Development in 2007 paint a less gloomy picture with the broadband adoption gap between rural and metro areas being closer to 11 percent. The gap exists; often compounded by demographic characteristics of rural MN communities, including an aging population, lower per capita income, and lower educational attainment. In fact, the Pew study lists factors that negatively correlate with home broadband adoption to be (in order of importance): Having less than a high school degree; age 65 or over; living in rural America, and having a high school degree. Analysis of the Pew study by Patchwork Nation (patchworknation.com) illustrates that 3 of the 5 community types with the lowest broadband adoption rates (Emptying Nests, Service Worker Centers, Tractor Country) comprise a majority Minnesota's rural counties.

In a 2009 statewide study conducted by the University of Minnesota Crookston, a sample of Minnesota businesses found that in Minnesota, 10.3% of rural Minnesota businesses were not even connected to the Internet. An additional 4.3% were still using dial-up speeds. Eighty-two percent (82%) of those offline businesses operate within the retail, food/accommodation/tourism and other small sectors. Eighty -four percent (84%) of those offline businesses have 9 or fewer employees. Large percentages of the offline businesses are located in 3 economic development regions: southwest/south central, north central/west central, and northeast. Most of them (80%) have market areas within 100 miles of their location. These small businesses are the heart of the rural Minnesota economy. The viability of their businesses requires a move to online practices. Technical assistance and training is highly desired by rural Minnesota businesses. In the same study, 53.2% said that they would use more Internet in their business with the availability of technical assistance."

The above two paragraphs quoted directly from the Blandin Foundation's 2009 proposal to the NTIA Broadband Technology Opportunities Program Sustainable Adoption Program, set the stage and the rationale for the Minnesota Intelligent Rural Communities Project. While broadband technology was being embraced by Minnesota citizens and businesses, the gap between rural and metro area residents and businesses was significant. In part due to demographic and socio-economic differences, as well as differential access and availability to broadband, there was a concern that this gap between rural and metro adoption rates would not be closed without some type of intervention. As a result, the Grand Rapids-based Blandin Foundation led a coalition of organizations and communities to establish the Minnesota Intelligent Rural Communities Project.

Based upon the framework of the New York-based Intelligent Communities Forum, the MIRC project combined a persistent statewide public awareness campaign with both a statewide intervention strategy throughout rural Minnesota; and an aggressive community-based development effort. The ICF framework revolves around a handful of core community characteristics that can be measured and monitored, such as: Broadband Access and Availability; Digital Inclusion; Knowledge Workforce; Innovative Orientation; and Marketing, Advocacy and Policy. Together, they form the basis for communities that are not only prepared, but are capable of strategically advancing their broadband and adoption goals, as well as their economic development strategies.

The coalition of partnering organizations was both impressive and to some degree unprecedented. In addition to the Blandin Foundation, partnering organizations came from the state Economic Development Agency (DEED); Minnesota's higher education institutions (U of M, Crookston, U of M Exten-

sion and MnSCU); all nine of the Minnesota's rural-based Regional Development Organizations; the non-profit PC's for People organization and the Minnesota Renewable Energy Marketplace. As a result, the coalition of organizational partners covered every region of rural Minnesota and created a statewide technical assistance footprint.

As noted above, a key component of the MIRC project was its focus on community-based strategies; and as such, the project included 11 distinct geographies across the state to serve as living laboratories for these community-based interventions. These communities were selected through an application process and communities were selected based upon a number of criteria, including their readiness, need and geography. Facilitated by the consulting firm Community Technology Advisors, each of the 11 communities were vetted and selected based upon this criteria.

By late 2009 The BTOP-SBA proposal was submitted and in the spring of 2010 the federal award was made to the Blandin Foundation for $4.8 million. In May 2010 the Blandin Foundation met with all of the partners and community representatives together for the first time at Sugar Lake Lodge for an orientation meeting. And for the last two and one-half years this remarkable coalition has been working toward the goal of increasing broadband adoption throughout rural Minnesota. As the project activities are now completed it's of interest to note that on November 1, 2012 the Blandin Foundation was awarded the 2012 Tekne Award for Innovative Collaboration from the Minnesota High Tech Association for their efforts on the MIRC project. It clearly was fitting recognition for this collaborative effort.

II. Methodology

The MIRC project evaluation utilized what can best be described as a "Pre-Post" strategy to measure change and impact. In spring 2010 studies were initiated to establish baseline characteristics on a number of community characteristics.

Subscription and Adoption Baseline

Utilizing telephone interviews, over 4,000 residents were surveyed across rural Minnesota to establish both a statewide baseline rate for rural Minnesota, as well as a baseline rate for each of the 11 MIRC demonstration communities. This design would allow us to not only examine change in broadband subscriptions and adoption rate from Spring 2010 (Time [1]) to Fall 2012 (Time [2]), but also provide us with the capacity to contrast the change across the rural MIRC communities with those across rural Minnesota statewide.

Community Benchmarking Baseline

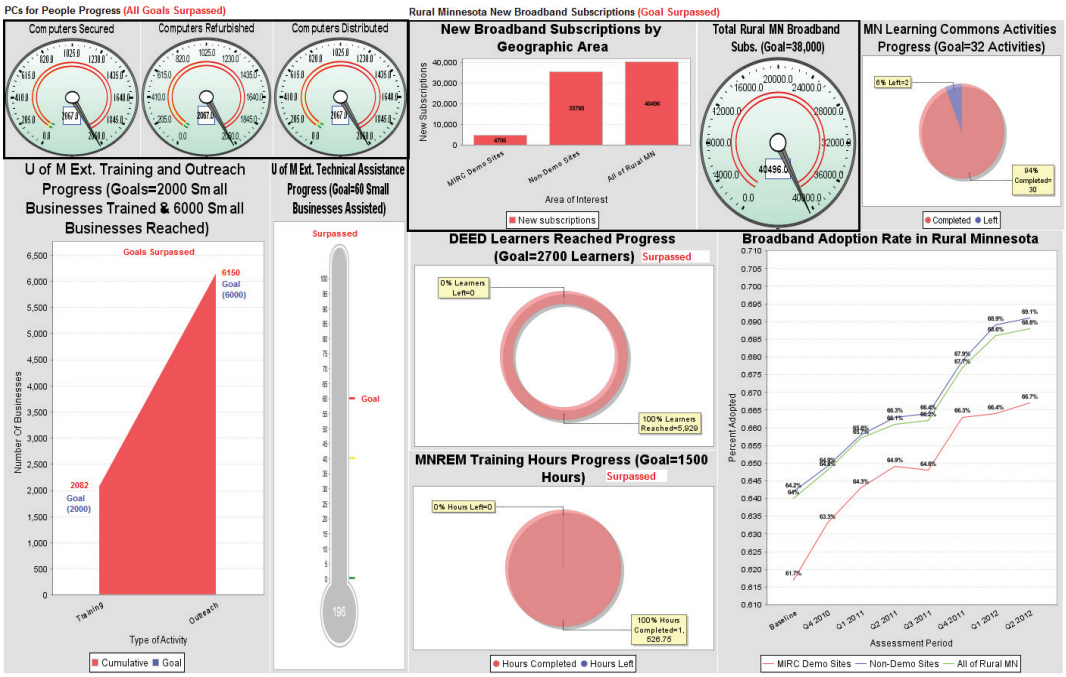
In addition to the telephone interviews, baseline data was also collected in each of the communities examining community characteristics congruent with the Intelligent Community Forum framework. Accordingly, in addition to the collection of demographic, socio-economic, economic and other secondary community characteristics, information was collected by each community-based team on characteristics related to the ICF framework. These included measures on community policies and advocacy efforts, technology in the local schools, educational attainment measures of the local workforce, and broadband accessibility as well as affordability.

These measures were then analyzed by the Intelligent Community Forum in New York and a baseline report was drafted, providing each of the MIRC communities a score for each parameter, as well as an

overall score. Similar to the Subscription and Adoption Baseline study, the ICF baseline was then replicated in 2012 to assess changes throughout the course of the MIRC project.

Monitoring MIRC Activity

Providing NTIA accurate quarterly reports of progress was a primary responsibility of the project evaluation team. Accordingly, it was vital that the project evaluation team was able to monitor the monthly activity of each of the project partners noted in Section 5. These are the organizations that provided much of the day-to-day interventions (e.g., workshops, training activities, consulting, computer acquisition and public awareness) as part of the MIRC strategy. This required the design of monthly activity reporting forms for each of the project partners. To accomplish this, discussions were held individually with each of the MIRC partnering organizations in May 2010 to review the proposed activities and goals for each of these organizations as designed in the project proposal. From these discussions a web-based reporting form was created for each organization to complete online and submit directly each month. In addition, a web-based set of dashboards were created that allowed project participants, partners and interested community members to track the activities of the partnering organizations and observe their efforts to reach the project goals as outlined in the proposal, which is included below and may be viewed online at www.edacenter.org/mirc-dashboard.php.



Tracking Changes in Broadband Subscriptions

While the overall evaluation strategy rests on a "Pre-Post" design, it also was important to NTIA that funded projects provide accurate information regarding changes in the number of new broadband subscriptions each quarter. To do this we contracted with a third party vendor who had proprietary software that enabled us to track the number of unique IP addresses in any given geography engaged in web-based transactions. The software known as "Broadband Scout" enabled us to closely examine the number of unique IP addresses in any given geography and compare changes each quarter. These changes in unique IP addresses quarter-by-quarter were then transformed into adoption rates based upon the number of households in each geography.

Combined these tools allowed us to establish a very accurate baseline for all of the MIRC communities, in terms of their adoption rates, economies, measures of digital inclusion, and innovativeness. In addition, the methodology employed allowed us to monitor all of the activities each month by all MIRC partners involved in classes in digital literacy, procurement and distribution of computers, public awareness campaigns and technology consulting with local rural businesses. Taken together, the methodology gave us the tools to measure output, change, and attempt to attribute that change to the programmatic activities.

III. The MIRC Communities

The MIRC project focused digital literacy efforts in 11 communities across rural Minnesota. The communities included four municipalities (Thief River Falls, Windom, Winona, and Worthington), five counties (Benton, Cook, Itasca, Kandiyohi, and Stevens), one economic development region (Upper Minnesota Valley), and one Native American reservation community (Leech Lake Band of Ojibwe). Focusing on these communities put the presence of the MIRC project in every corner of rural Minnesota and was intended to determine the impact of education, training, and outreach efforts within communities of varying population, sizes, and social and economic profiles.

The projects conducted in each community varied in number and scope. Communities conducted as few as 3 projects or as many as 15 projects. The projects conducted primarily focused on 3 aspects of digital literacy: educational projects training members of the community in certain functions of broadband technology and/or computer use, improving or developing community members' utilization of the internet (such as developing a website), and the purchase of new equipment such as routers to improve wireless availability or computers for use by members of the community.

Benton County

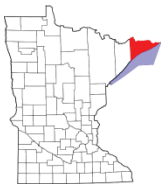
Benton County is located in the central part of Minnesota and is in close proximity to the Minneapolis/St. Paul metro-area. Benton County is unique to the other communities in that part of St. Cloud is located within the county. As a result, when reporting and assessing demographics and other measures within Benton County we did not include St. Cloud. However, since St. Cloud universities and colleges are within easy commuting distance of Benton County we have included St. Cloud State University (15,879 undergraduates and 1,725 graduate students) and St. Cloud Technical and Community College (4,708 full and part-time students) when factoring in access to higher education. When removing St. Cloud residents of Benton County, the population is 32,055 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older, 90.5% have a high school diploma with 19.5% holding a bachelor's degree or a graduate/professional degree. The most recent number of degrees conferred at St. Cloud State University is 2,637 undergraduate degrees and 500 graduate/professional degrees. The most recent number of degrees conferred at St. Cloud Technical and Community college is 678 associate's degrees. The median age is 34.1 years old with 20.7% of the population is 5-19 years old and 12.8% of the population is 65 and older. The median household income is $51,159 with 13.4% of the population below the poverty line.

Over the past two years, Benton County has conducted 15 separate projects primarily related to education, utilization, and the purchase of equipment. There are three primarily education-related projects. First, Foley Community Education increased computer lab time and provided classes for students, businesses, and community members to more frequently engage in the use of high-speed internet, telecommuting, and online research tools. Some classes related to what to look for when buying a new computer as well as classes that related to creating a resume. Second, Independent Lifestyles, Inc. provided curriculum, utilization, and training for computers and internet training with Project BRAVE (Broadband, Resources and Vocational Exploration). This project served individuals and school-age youth with disabilities by giving them training in computers and internet technology to increase their daily living independence as well as educating community members through Vocational Rehabilitation Services. Lastly, Sauk Rapids-Rice Community Education increased computer lab time for students and community members as a way to increase use of high-speed internet and improve technology skills. Parents were also given training on using the School District's web portal.

Ten projects were completed related primarily to utilization of high-speed internet technology. A new website was created to market Benton County as a "Knowledge Community" where information regarding broadband access across the county can be posted. The City of Foley made improvements to the city website to allow residents to make payments online as well as obtain information regarding utilities, ordinances, and notices. The purpose of this project was to allow city business to be conducted in a more efficient manner as well as encourage broadband use. Country Manor Campus developed a project called "Enriching Lives" which gives seniors the ability "to communicate with family and friends, and explore new horizons available via web-based education, entertainment and daily life enrichment". Foley and Sauk Rapids-Rice High Schools gained access to Questia, which is considered the world's largest online library, and encourages the students to use the internet for research. Foley High School created a website for the school's Future Farmers of America organization (FFA) which allowed the students to interact with local agricultural community as well as develop a well water testing project with the rural community. LA Home Care began using a combination of Smart Home Technologies, Activities of Daily Living monitoring, high-speed internet communications, and telewellness to enable the elderly to live at home longer with greater security and less social isolation. Maywood Group/New Frontier Services conducted a program which offered additional services eliminating constraints and getting small and new businesses started with a website and company email address through the "Dolt4Website" process.

The MIRC Steering Committee conducted two projects which marketed the MIRC programs through economic development with a new logo, poster campaign for Wi-Fi sites, Wi-Fi window clings, as well as hosting a number of events which promoted MIRC activities under the theme "change or become obsolete". Lastly, the new "What's up in Foley" community website increased exposure to community events, information, and opportunities. Non-profit organizations were also able to communicate their own information, such as directory and event listings, on the website at no charge.

Two projects related to equipment in Benton County with the intention of encouraging broadband use. Wireless routers were purchased for both Foley Public Schools as well as other areas around the county which created more "hot spots" and provided more areas with access to wireless internet. This project not only allowed students and teachers in schools to access the high-speed internet, but it also encouraged people in the community to use broadband more frequently.



Cook County

Cook County is located in the northeastern corner of the state along the North Shore of Lake Superior. The population of Cook County is 5,176 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 93% have a high school diploma with 33% holding a bachelor's degree or a graduate/professional degree. The median age is 49.8 years old with 14.1% of the population 5-19 years old and 20.3% of the population 65 and older. The median household income is $49,496 with 9.1% of the population below the poverty line.

Over the past two years, Cook County conducted 8 projects primarily related to education, utilization, and the purchase of new equipment. The one project primarily relating to education was conducted by Cook County Higher Education. Cook County Higher Education created and equipped a lab facility for the purpose of hosting events touting the benefits of broadband and educates the community on how to use its tools. Digital inclusion issues were addressed as well as the training needs for future knowledge workers.

Two projects were primarily related to utilization. First, the Cook County Visitor's Bureau made their tourism-related sites compatible with mobile devices in order to increase visitor traffic as well as making the website more user-friendly. Lastly, Sawtooth Mountain Clinic began collecting patient data using online forms. They also explored how to use social media as a method of delivering important and educational healthcare messages.

Five projects were primarily related to purchasing new equipment. First, Boreal Access put the necessary equipment in place to produce, upload, and serve local media content (this includes video production, editing, and storage). Cook County Historical Society acquired equipment, software, and the labor necessary to digitally convert their collection database so it can be accessed through a searchable database on their website. Grand Marais Public Library added four laptops and two e-readers to increase public access to broadband. Independent School District #166 purchased equipment to make it possible to stream live video from one of the gymnasiums. Lastly, WTIP purchased equipment through the Eye to Eye Video Project which allowed them to expand their use of online video.

Itasca County

Itasca County is located in the north-central part of the state. The population of Itasca County is 45,058 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 92.4% have a high school diploma with 20.9% holding a bachelor's degree or a graduate/professional degree. Itasca Community College is located within Grand Rapids and has a most recent listed enrollment of 1,290 full and part-time students. The most recent number of degrees conferred at Itasca Community College is 275 associate's degrees. The median age is 45.4 years old with 18.9% of the population 5-19 years old and 19% of the population 65 and older. The median

household income is $47,106 with 11.4% of the population below the poverty line.

Over the past two years, Itasca County conducted 5 projects primarily related to education and the purchase of new equipment. First, the Senior E-literacy Project provided seniors in rural Itasca County access to broadband services through basic computer training, specific skills training related to online banking, and follow-up support. Second, the Grand Rapids Library provided their equipment and trained members of the community to "expand the understanding, use and availability of broadband internet". Lastly, the Itasca County Family YMCA provided training to "expand the understanding, use and availability of broadband internet" to the patrons of the Bruce Bauer Senior Center.

There were two projects related primarily to the purchase of new equipment. First, Itasca Community Television purchased additional equipment that allowed for a seamless delivery of video to online viewers, particularly rural residents who may not have cable access. Lastly, KOOTASCA Community Action provided a computer and a one year broadband subscription to at least 20 low-income families.

Kandiyohi County

Kandiyohi County is located in the south-central part of the state. The population of Kandiyohi County is 42,239 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 88.1% have a high school diploma with 21% holding a bachelor's degree or a graduate/professional degree. Ridgewater College is located in Willmar and has a most recent listed enrollment of 4,146 full and part-time students. The most recent number of degrees conferred at Ridgewater College is 574 associate's degrees. The median age is 39.5 years old with 20.2% of the population 5-19 years old and 16.2% of the population 65 and older. The median household income is $49,915 with 12.7% of the population below the poverty line.

Over the past two years, Kandiyohi County conducted six projects primarily related to utilization, and the purchase of new equipment. There were three projects related to utilization. First, MinnWest Technology Campus provided a learning center with interactive communication that was used for distance education, training/continuing education, and streaming presentations and conferences. Second, the Economic Development Commission provided funding through grants for businesses to develop a website or enhance an existing website to be more interactive. Lastly, Willmar Community Senior Network connected family members to the facility network to allow them more access to seniors staying at the facility.

There were three projects related to the purchase of new equipment. First, New London Spicer School District purchased wireless routers, community access computers, and an iPad lab. Second, with the help of PCs for People computers were provided to low-income families. Lastly, the Computer Access for Education and Employment program purchased a "bank of computers in a bi-lingual environment" for use at the Willmar Women & Family Center in order to provide new immigrants easy access to computers, broadband internet, and any necessary training on computer, software, and internet usage.

Stevens County

Stevens County is located in the west-central part of the state. The population of Stevens County is 9,726 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 89.8% have a high school diploma with 23.6% holding a bachelor's degree or a graduate/professional degree. The University of Minnesota, Morris is located in Morris and has a most recent listed enrollment of 1,932 full and part-time students. The most recent number of degrees conferred at the University of Minnesota, Morris is 280. The median age is 33.9 years old with 21.4% of the population 5-19 years old and 16.4% of the population 65 and older. The median household income is $47,712 with 14.3% of the population below the poverty line.

Over the past two years, Stevens County conducted 14 projects related primarily to utilization and the purchase of new equipment. There were three projects related primarily to utilization. Two of the projects related to new websites for the Morris Housing and Redevelopment Authority. The Morris HRA developed a new website with all of the Morris Public Housing Program documents available as well as up-to-date guidance and educational information for past, present, and prospective public housing tenants. They also developed a new website for their Rental Housing License Program with all of the program documents available online as well as up-to-date inspection results, guidance and educational information to past, current, and prospective tenants and landlords. Lastly, Stevens Forward provided county-wide coordination of "public entity website development" which included at least one county government site, one chamber of commerce site, one economic development organization site, and one Resource Connections site.

There were 11 projects related primarily to the purchase of new equipment in Stevens County. Chokio-Alberta Public School District #771 increased broadband speed from 3Mbps to 6Mbps and purchased four new wireless routers. Hancock Public Library purchased one laptop along with ancillary equipment for use by library. When not in use, certain community organizations may use it at no cost for workshop/training purposes. Hancock Public School District #768 increased its broadband speed from 3Mbps to 10Mbps. Midwest Special Education Cooperative purchased equipment necessary to provide its speech therapy classes online in nine West Central Minnesota Public School Systems and used the data to measure the effectiveness of this new method of delivery to see if it is feasible for future use.

The Walter Tripp American Legion Post 29 purchased equipment and became a community Internet center. Members of the community are now able to use the facility during normal business hours and recognized community organizations may use the facility for training and workshops at no charge. The Morris Area Chamber of Commerce added two new computers and ancillary equipment to further support the Chamber's existing communication/information system. The Chamber also provided better coordination between various communities via online collaboration. The Morris Area School District purchased wireless routers and allowed a more liberal use of electronic devices by the students as a way of enhancing their learning experience. The Morris Area Community Education (MACE) purchased 10 laptops and ancillary equipment for MACE and Morris Area School use. When not in use by MACE or the school, recognized organizations may use the equipment for workshop and training purposes at no charge. The Morris Public Library purchased six laptops and ancillary equipment for use within the library. When not in use, recognized organizations may use the equipment for workshop

and training purposes at no charge. Resource Connections purchased at least one computer and one wireless router for public use in five cities across Stevens County. Resource Connections also purchased a three year internet subscription for each of the cities so the community could use the equipment at no charge. Stevens County Historical Society purchased a public access computer station and wireless routers for use in the lecture space and upper and lower meeting spaces. Stevens County Historical Society also put all of its records and photos on its website.

Leech Lake Ojibwe

Leech Lake Band of Ojibwe

The Leech Lake Band of Ojibwe is located in the north-central part of the state and spans across 4 counties: Cass, Itasca, Beltrami, and Hubbard (with most of the reservation located in Cass County). The population within the Leech Lake Reservation is 10,660 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 88.9% have a high school diploma with 19.1% holding a bachelor's degree or a graduate/professional degree. Leech Lake Tribal College is located in Cass Lake and has a most recent listed enrollment of 206 full and part-time students. The most recent number of degrees conferred at Leech Lake Tribal College is 25. The median age is 39 years old with 22.5% of the population 5-19 years old and 15.5% of the population 65 and older. The median household income is $43,941 with 22.7% of the population below the poverty line.

The Leech Lake Band of Ojibwe conducted 4 projects primarily related to the purchase of new equipment. First, the Boys & Girls Clubs created a *Club Tech Center* by purchasing computers and appropriate hardware and software. In addition to serving youth, the *Club Tech Center* also provided computer and high-speed internet access to members of the community. Second, the LLBO Department of Natural Resource Management upgraded the existing computer system which allowed for GIS mapping of tribal lands. This made for more efficient use of GIS software with the resulting maps and other information accessible to the public through their website. Third, the LLBO Environmental Department and Head Start coordinated a computer recycling program for low-income families associated with Head Start. Lastly, the LLBO Temporary Employment Program created four community computer labs with a focus on providing computer access and internet training to LLBO members involved with the Temporary Employment Program.

Thief River Falls

Thief River Falls is located in the northwest corner of the state within Pennington County. The population of Thief River Falls is 8,573 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 86.4% have a high school diploma with 16% holding a bachelor's degree or a graduate/professional degree. Northland Community and Technical College is located in Thief River Falls and has a most recent listed enrollment of 3,958 full and part-time students. The most recent number of degrees conferred at Northland Community and Technical College is 566 associate's degrees. The median age is 37.6 years old with 18.2% of the population 5-19 years old and

17.7% of the population 65 and older. The median household income is $38,306 with 13.1% of the population below the poverty line.

During the past two years Thief River Falls has completed three projects related to education and utilization. Computers for our Community developed workforce programs intended "to connect area youth to technology initiatives including computer refurbishment and computer/internet training". The Thief River Technology Expo organized private sector vendors for various demonstrations and classes relating to broadband technology and its applications. Lastly, the Thief River Falls Technology Connection Center has a space available where businesses and members of the community can have access to high-speed internet, computers, and training classes.

Windom 

Windom is located in the southeast corner of Cottonwood County. The population of Windom is 4,646 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 82% have a high school diploma with 17.8% holding a bachelor's degree or a graduate/professional degree. The median age is 42.6 years old with 18.9% of the population 5-19 years old and 21.2% of the population 65 and older. The median household income is $37,152 with 16.6% of the population below the poverty line.

During the past two years, Windom has conducted six projects related to utilization and the purchase of new equipment. There were four projects related to utilization. The Access to Technology, Today and Tomorrow project supported infrastructure development, bandwidth availability, and provided community members with access to computer equipment to encourage broadband usage. The City of Windom developed a community internet portal called "Finding Windom" for the purposes of marketing Windom and providing links and connections to social media, businesses, services, and visitor information. Windom Area Schools expanded broadband availability by using a free, content filtered internet connection for both community and student use. Lastly, Windom Education and Collaborative Center and the Windom School District provided video conferencing in five locations in two separate buildings. This service was made available to all members of the community and students.

There were two projects related to the purchase of new equipment within Windom. First, the City of Windom purchased laptops, mobile networks, and software in 14 emergency service and law enforcement vehicles. This equipment provided portable broadband access during emergencies, natural disasters, and law enforcement responses. Lastly, Windom Area Schools purchased more computers and iPads for student use. They also hosted Community Education Classes on iPad use. The elementary classroom component of this project focused on the Students in the *Response to Intervention Program.* Students involved in this particular program struggle or are behind in their scholastic achievement and typically lack the financial resources to access broadband technology.

Winona 

Winona is located in the southeast corner of the state within Winona County. Winona is in close proximity to the La Crosse, Wisconsin metropolitan area. The population of Winona is 27,592 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 89.3% have a high school diploma with 29.2% holding a bachelor's degree or a graduate/professional degree. Winona is home to 3 institutions of higher education: Winona State University (8,439 full and part-time undergraduates and 521 graduate students), St. Mary's University of Minnesota (2,061 full and part-time undergraduates and 3,627 full and part-time graduate students), and Minnesota State College-Southeast Technical (2,418 full and part-time students). The most recent number of degrees conferred at Winona State University is 1,545 undergraduate degrees and 135 graduate/professional degrees. The most recent number of degrees conferred at St. Mary's University of Minnesota is 495 undergraduate degrees and 1,093 graduate/professional degrees. The most recent number of degrees conferred at Minnesota State College-Southeast Technical is 267 associate's degrees. The median age is 26.7 years old with 21.6% of the population 5-19 years old and 13.3% of the population 65 and older. The median income is $35,964 with 23.4% of the population below the poverty line.

Over the past two years, Winona conducted six projects related primarily to education, utilization, and the purchase of new equipment. The single project related to education was conducted by Project FINE and focused on technology education for immigrants and refugees. The broadband training was conducted in four phases: 1) introduction to broadband technology, 2) internet access and tools, 3) access to home computers, and 4) continuing training. The single project relating to the purchase of equipment was conducted by the Winona Workforce Center. The Winona Workforce Center purchased four laptops and a laptop case for the E-Travel Center. The E-Travel Center is a mobile laptop lab that provided introduction to computers and basic Word and Excel training.

The other four projects were designed primarily for utilization. The City Of Winona conducted three of these projects. The first project funded a redesign of the City of Winona's website to function as a "digital front door". The second project provided free Wi-Fi at four locations in Winona, wireless service in all public meeting rooms in City Hall, and web streaming video for Council Chamber meetings. The third project promoted Winona's MIRC efforts and the City's Intelligent Community assets which were published on the city's website. This project also sent promotional materials to media outlets in the region (La Crosse, Rochester, and Minneapolis/St. Paul), the Digital Perch website produced for the Online Support Center Website project, and content for the city's wireless portal at Levee Park. Lastly, the Winona Workforce Center in collaboration with Southeast Technical College developed a website to support businesses interested in e-commerce, social media, and other internet business applications.

Worthington 

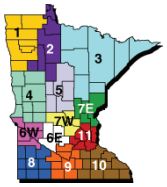
Worthington is located in the southwest corner of the state within Nobles County. The population of

Worthington is 12,764 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 72.4% have a high school diploma with 17.4% holding a bachelor's degree or a graduate/professional degree. One of five campuses for Minnesota West Community and Technical College is located in Worthington. The TOTAL enrollment for Minnesota West Community and Technical College is 3,364 full and part-time students. The most recent number of degrees conferred on the Worthington campus is 339. The median age is 33.5 years old with 20.4% of the population 5-19 years old and 15% of the population 65 and older. The median income is $42,472 with 26.8% of the population below the poverty line.

Over the past two years, Worthington conducted six projects related primarily to education, utilization and the purchase of new equipment. The single project related to education was conducted by the Nobles County Integration Collaborative (NCIC). The NCIC worked with Cable TV3 and trained high school students how to use video cameras and video editing equipment. The students conducted interviews, edited the film, and shared the product with the community on Cable TV3.

There were three projects related to utilization. First, St Mary's School implemented new technology tools in the 2011 school year which provided constant internet access in the school. St. Mary's School also used technology, such as SmartBoards in the classroom which allowed students to work with online and downloadable activities. Second, WGTN-TV developed a website which allowed for live web streaming of community events and government meetings for those without access to cable. Lastly, the Worthington Regional Economic Development Commission used technology which transmitted training and business information throughout southwest Minnesota. The project provided digital learning and career exploration for high school students, increased skills for the employees in the included industries, and created a network of information sharing.

There were two projects related to the purchase of new equipment. First, Nobles County Integration Collaborative purchased equipment for a small computer lab to be used on site as well as laptops which can be checked out by area agencies for training purposes. This project also allowed for the purchase of a wireless access point for the West Learning Center, which serves many immigrant families in the area. Lastly, the Worthington Independent School District #518 purchased iPads and additional wireless access points throughout the districts. The iPads were made available to all students in the district. This project also allowed for training on the use of interactive tools and wireless devices to all members of the community, even if they did not have children enrolled in the school district.



Upper Minnesota Valley (Region 6W-light purple)

The Upper Minnesota Valley Region is located in the southwest part of the state and contains 5 counties: Big Stone, Chippewa, Lac qui Parle, Swift, and Yellow Medicine. The population of all five counties in the Upper Minnesota Valley is 45,190 according to the 2010 census. With respect to educational attainment, of the population who are 25 years and older 88.1% have a high school diploma with 16.4% having a bachelor's degree or a graduate/professional degree. Two of five campuses for Minnesota West Community and Technical College are located in Granite Falls and Camby. The TOTAL enrollment for Minnesota West Community and Technical College is 3,364 full and part-time students. The most recent number of degrees conferred on the Granite Falls campus is 207. The most recent

number of degrees conferred in Camby is 109. The median age is 45.6 years old with 18.7% of the population 5-19 years old and 20.9% of the population 65 and older. The median income is $46,401 with 10.9% of the population below the poverty line.

Over the past two years, the Upper Minnesota Valley Region conducted seven projects relating primarily to education and utilization. There were two projects relating to education. First, Ortonville School and the Ortonville Economic Development Authority conducted training sessions to encourage broadband usage by: 1) giving businesses an understanding of the benefits of broadband usage, 2) giving community members a sense of the information they may obtain by using broadband, 3) encouraging a viable economic community and school system that uses technology, and 4) involving youth in the community's development. Lastly, Pioneer Public Television produced a segment showing how individuals and businesses in the area were negatively impacted by the lack of broadband availability.

There were five projects related to utilization. Big Stone County provided online access to government information and other resources, such as forms. The Community Digital Literacy project connected businesses, community members, and students through a Multimedia Collaboration Center, a Student Tech Team, and a hybrid Teacher/Community Training Academy. Johnson Memorial Health Services used broadband-based remote support tools and enhanced family engagement with the older population in an effort to determine appropriate hospital visits as well as achieve increased medicine adherence. Lac qui Parle County Economic Development Authority used a mobile computer lab to increase digital awareness and inclusion of residents and businesses. Lastly, the Upper Minnesota Valley Regional Development Commission assisted Bellingham and Echo with the creation of community websites.

IV The Starting Point

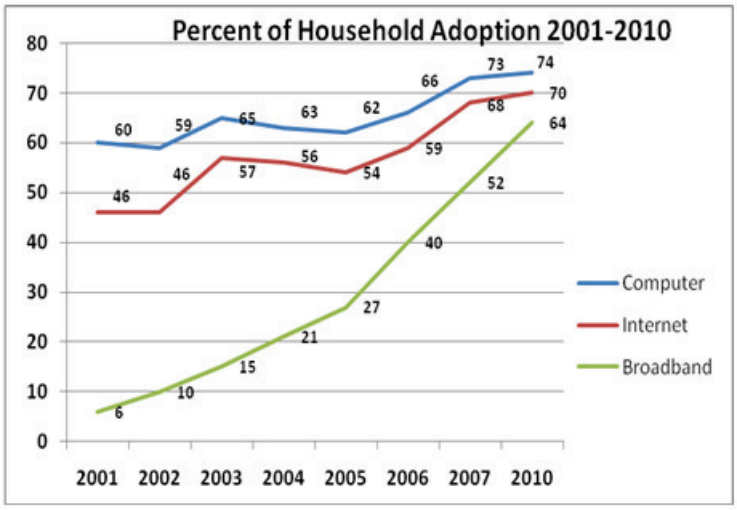
As noted earlier, detailed studies within and across the MIRC communities were conducted in 2010 to establish a baseline regarding adoption rates, correlates to adoption, barriers to adoption and community benchmarks as they relate to the Intelligent Community Forum framework.

Adoption Baseline

The MIRC baseline study was conducted in the spring/summer 2010 and released in November of that same year (appendix 1). Data for the statewide study was conducted through telephone interviews among 911 households across rural Minnesota. The sample was stratified based upon degree of rurality, categorizing rural counties as being (1) adjacent to a metro county; (2) non-adjacent; or (3) remote rural. The data were collected by the St. Peter-based Center for Rural Policy & Development from May through July 2010. The statistical margin of error was $\pm$ 4 percent.

Data for the demonstration communities were also gathered through telephone interviewing, with each demonstration community being treated as a separate sample with an "N" of at least 300. As noted on Figure 1, some of these communities are actual municipalities (e.g., Windom, Winona, Worthington and Thief River Falls), while others were entire counties. Also counted as a "demonstration community" were other geographies such as the 5-county Upper Minnesota Valley Regional Development Commission Service area in the west central region, or the Leech Lake Band of Ojibwe Reservation in North Central Minnesota. Due to the lack of uniformity in population or geography among the demonstration areas, the sample sizes varied somewhat with an average margin of error of 5.6 percent. The data were collected by the Center for Small Towns at the University of Minnesota, Morris from May 2010 through July 2010; and similar to the statewide survey, cell phone only users were excluded from these efforts as well.

Chart 1. Percent of Household Adoption 2001-2010



The chart to the left provided the baseline for adoption and utilization for rural Minnesota statewide. As one can see, computer ownership was 74 percent, with Internet connectivity at 70. Broadband adoption in 2010 was found to be 64 percent across all of rural Minnesota. This broadband adoption rate of 64 percent would serve as the reference point for the MIRC communities.

Table 1. Computer Ownership Baseline Adoption Rates for MIRC Communities

MIRC Community	Computer Ownership	Internet Connectivity	Broadband Adoption	Dial-up Adoption
Benton County	74.2%	70.6%	66.3%	4.3%
Cook County	83.3%	74.8%	50.2%	24.6%
Itasca County	72.9%	68.2%	63.3%	4.9%
Kandiyohi County	74.0%	66.5%	64.0%	2.5%
Leech Lake Band	66.9%	57.4%	48.8%	8.6%
Stevens County	73.9%	68.1%	64.4%	3.7%
Thief River Falls	71.1%	67.0%	59.4%	7.6%
Windom	69.8%	66.4%	62.7%	3.7%
Winona	80.2%	76.0%	69.2%	6.8%
Worthington	61.3%	56.0%	53.9%	2.1%
Upper MN Valley	67.5%	60.2%	57.6%	2.6%
Rural MN Statewide	74.3%	70%	64%	6%

As one can see from Table 1, there was a wide range of broadband adoption and utilization across the 11 MIRC Demonstration communities ranging from a low of 48.8 percent to a high of 69.2 percent. Of course this variation reflects the variation in communities. In general, those communities with the highest broadband adoption rates tend to be communities that are more proximate to metropolitan areas or have colleges/universities located nearby. Communities with lower adoption rates tend to reflect regions that are more remote, or have larger percentages elderly or low-income residents.

The one notable exception is Cook County, which has a highly educated population, but due to its remote location had very limited access high-speed broadband services. As a consequence, Cook County had the highest rate of computer ownership and the second highest rate of Internet connectivity, but a disproportionate percentage of their connectivity was still through a dial-up connection. However, it is valuable to note that through the federal stimulus program Cook County received a multi-million dollar grant to support the construction of a fiber-to-the-premises broadband network across the county.

Chart 2. Baseline Rural Minnesota Internet Connection Type

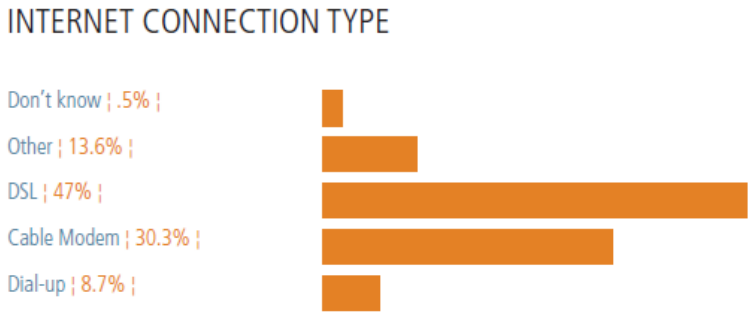
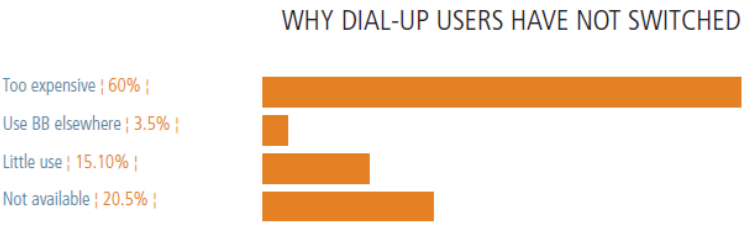


Chart 2 documented how rural residents who were online actually connect to the Internet. Here we see that DSL technology maintains a greater market share over cable modem connections in rural areas. This may likely be due to the geographic reach of DSL into the rural countryside, whereas cable connections typically end at or near the municipal boundaries. Further, notice that 8.7% of those households online still maintain a dial-up connection, and 13.6 percent report connecting through a fixed wireless, satellite, or some other technology.

Chart 3. Baseline Reasons Dial-up Users have not Switched to Broadband



Dial-up users were also specifically asked why they have yet to switch to a broadband connection. And as you can see from Chart 3 the overwhelming response was that broadband is still too expensive (61%). Slightly over 20 percent reported that broadband was simply not available where they lived, while 15 percent reported that they simply did not connect to the Internet often enough to justify the added expense of a broadband connection. Also interesting is that only 3.5 percent of current dial-up users reported the reason why they have not purchased a home broadband connection is due to their use of a broadband connection elsewhere, such as at work, at the public library, or at a friend's or relative's house. Such a low percentage suggests that these dial-up users were not accommodating broadband into other facets of their life and were not likely to switch without a specific intervention.

ICF Baseline

As noted earlier the ICF framework is designed to assist communities in identifying strengths and weaknesses in meeting their broadband and development goals in a 21st century knowledge economy (appendix 2). As such it is based upon the five pillars of Broadband, Knowledge Workforce, Innovation, Digital Inclusion and Marketing and Advocacy. Community-based indicators for each of these pillars were prescribed by the Intelligent Community Forum and both primary and secondary data were collected from each of the 11 demonstration community. Utilizing an algorithm devised by the Intelligent Community Forum, each community was scored across these five pillars and a total score was then calculated for each of the demonstration communities. In the scoring of the communities each pillar is equally weighted with scores between 0-20 making total community scores of between 0-100.

Table 2. Demonstration Community Baseline ICF Scores

	Broad-band	Knowledge Workforce	Digital Inclusion	Innovation	Marketing & Advocacy	Total
Kandiyohi County	19.11	14.56	9.44	13.33	16.40	72.84
Winona	19.11	17.24	15.44	14.00	5.80	71.60
Itasca County	18.22	14.56	10.44	14.67	11.00	68.89
Windom	19.11	9.82	14.44	12.33	9.80	65.51
Benton County	19.11	15.69	10.44	12.33	8.80	66.38
Cook County	17.33	13.00	9.44	14.33	10.40	64.51
Stevens County	19.11	12.16	9.44	9.67	13.20	63.58
Thief River Falls	19.11	14.56	9.44	12.67	7.20	62.98
Upper MN Valley	19.11	12.16	9.44	13.33	7.00	61.04
Leech Lake	17.33	14.56	9.89	11.67	6.80	60.24
Worthington	19.11	12.16	13.44	12.33	2.40	59.44
Averages	**18.71**	**13.68**	**11.03**	**12.79**	**8.98**	**65.18**

As shown in Table 2 the demonstration communities all scored quite high in the area of broadband, reflecting the availability of the technology throughout rural Minnesota. In this instance Cook County and Leech Lake were notable exceptions. However, many communities scored quite poorly in the area of digital inclusion and most scored very poorly in the area of Marketing and Advocacy. This reflects the reality that most rural Minnesota communities have yet to engage in broadband advocacy or policy development.

As a result, the five top-scoring demonstration communities were Kandiyohi County, Winona, Itasca County, Windom and Benton County. All of these communities scored above the regional average. On the other hand, Cook County, Stevens County, Thief River Falls, Upper MN Valley, Leech Lake and Worthington all scored below the regional averages.

V. The MIRC Partners

PCs for People

PCs for People is a non-profit corporation located in St. Paul and Mankato, MN created in 1998. The mission of PCs for People is to collect old computers and rebuild/refurbish them. Once the computers are refurbished, they are then given to people "who have limited experience with technology due to social, physical and/or economic circumstances". Since PCs for People's inception in 1998, they have distributed thousands of computers to low-income families who have never owned a computer before. When it comes to adopting broadband, there is more to increasing adoption rates than just educating people on how to use broadband technology. If there are low-income families without home computers, then it doesn't matter how much members of those households want to connect to the internet if they lack the means to connect to the internet. That is what PCs for People brought to the MIRC project. By distributing computers to low-income families, PCs for People gave them the opportunity to access and learn about the benefits of high-speed internet.

For the purposes of the MIRC project, PCs for People was enlisted to "coordinate donation, refurbishing and redistribution of no fewer than 1,000" fully functioning computers to low-income families across Minnesota with a focus on "communities of color". In instances where a computer did not go to a low-income family, it was given to an organization providing services to elderly, immigrants, unemployed, or other "people-in-need".

In order to motivate people to become involved with this project, PCs for people addressed two groups: potential donors for computer hardware and potential recipients of the computers. To motivate potential donors, they point out the necessity of computers for someone to become "an active participant in 21st century American life". They also convince potential donors that confidential data on old computers will be cleared when they give away their computers as well as non-working components being recycled appropriately. Motivation for those wishing to receive computers is not as difficult because they already see the benefit of computer ownership but are unable to get one.

During the course of this project, PCs for People worked with 22 communities (11 demo communities and 11 other rural communities) by providing their low-income residents computers as well as hosting mobile computer refurbishing events. Many of these communities have indicated an interest to continue this relationship with PCs for People. They also worked with various Regional Development Commissions as a way of becoming involved in the business community and give businesses an opportunity to recycle old computers for free. Lastly, PCs for People was able to open three affiliate offices in Willmar, Grand Rapids, and Brainerd by the end of this project. These affiliates will operate independently of the main office in St. Paul and will be able to continue serving the needs of their respective communities.

PCs for People developed some outside partnerships that contributed to their success during this project. The United Way and other community organizations aided PCs for People in finding eligible recipients for computers. They especially focused on locating elderly and families with young children who were in need of a home computer. The United Way as well as various Chambers of Commerce helped locate businesses in the community who were willing to donate old computers. Finally, PCs for People needed a computer repair business partner in each community to support the warranty and provide technical support after PCs for People have left the community.

The University of Minnesota Extension

The mission of the University of Minnesota Extension is to "create a stronger Minnesota through education and research". Extension accomplishes this goal by focusing on a wide variety of topics across Minnesota: community vitality, agriculture, environment, family, food, gardening, and youth leadership. For the MIRC project, Extension's Center for Community Vitality played a key role in educating and training small businesses across more than 50 rural communities using a variety of methods.

For the purposes of the MIRC project, the U of M Extension Center for Community Vitality was enlisted to "design and/or customize/update curricula on utilization of broadband-based technologies for business success". U of M Extension was to coordinate with other MIRC partners in the development, training, and delivery of the education and training programs. Their goal was to reach 2,000 small businesses (under 11 employees) across rural Minnesota with a primary focus on businesses within food/tourism/retail. They were to also reach at least 60 small businesses with "targeted technical assistance". Lastly, they were to provide outreach to 6,000 small businesses with a primary focus on minority and women owned businesses.

Over the past two years, U of M Extension conducted 306 workshops in 18 communities within the demonstration communities and other rural areas. In order to reach the most businesses possible, U of M Extension used direct methods, such as emails, phone calls, and personal visits as well as more indirect methods, such as media stories about the MIRC project.

Minnesota Department of Employment and Economic Development (DEED)

DEED is Minnesota's principle economic development agency. By using various programs, DEED works to "promote business recruitment, expansion, and retention; international trade; workforce development; and community development". DEED serves as a resource for job seekers, businesses, and local governments. With one of the goals of this project being reaching unemployed, underemployed, and dislocated workers DEED has the ability to make more efficient and extensive use of the workforce centers located in rural areas.

For the MIRC project, DEED was expected to expand access to computer centers 8 hours per week for 50 weeks across at least 30 workforce centers within rural areas. DEED was also expected to coordinate with other MIRC partners to conduct no fewer than 8 hours per month for 9 months of digital literacy training. With the expectation that one 8 hour class would serve at least 10 learners, they should serve a total of 2,700 learners. DEED sent out promotional materials which included: press releases, public service announcements, flyers, and the "captured promotional activity" which was printed shirts for the Leech Lake project. ESL classes were also held to help immigrants develop the skills necessary to find employment in Minnesota.

Minnesota Learning Commons

The Minnesota Learning Commons website provides free online resources for public education. Their portal allows Minnesotans access to "effective and efficient online learning provided by Minnesota public education partners". Learners from preschool up to college and adult learners as well as educators can use the portal. In order to fulfill their mission, the Minnesota Learning Commons have 3 goals: enhance relationships among their partners, deliver expanded access to online programs which meet the needs of all Minnesota learners, and establish a sustainable organization which increase access to public Minnesota "P-16" education. As a partner, Minnesota Learning Commons could leverage existing resources to create and conduct the Knowledge Worker course included in the MIRC project.

Minnesota Learning Commons was expected to develop a Knowledge Worker online course. The Knowledge Worker online course was a 16 hour course designed for unemployed, underemployed, dislocated workers, and employees. The first four hours of the course was led by an instructor who was present in the computer lab. There were then four modules of the course designed to assist the learners in determining what options they had when looking for their next job, career, or educational experience. The four modules were: an introduction to what is a knowledge worker, resources for exploring career pathways, information on innovative strategies in the workplace, and new/emerging technologies in the workplace. The expectation was this course would be delivered a minimum of 16 times per year for 2 years, or a total of 32 times.

Minnesota Renewable Energy Marketplace (MNREM)

The mission of the Minnesota Renewable Energy Marketplace (MNREM) is "to develop regional talent and businesses, boost innovation and support the cultivation of new technologies, in order to achieve a competitive advantage in the global economy". To accomplish this goal, MNREM strives to achieve sustainability in a global economy through retaining, creating, and attracting a more educated and skilled workforce. As a partner, MNREM could leverage existing resources to educate and train rural renewable energy businesses.

For the MIRC project, MNREM was expected to coordinate with other MIRC partners in designing curricula or other training resources "on the use of broadband-based technologies and services to promote business vitality and growth". They also organized and conducted training for staff at participating workforce centers related to delivery of digital literacy training. Lastly, MNREM was expected to deliver no fewer than 1,500 hours of training and/or technical assistance related to broadband-based technologies and services to rural renewable energy businesses.

Regional Development Commissions

Within the state of Minnesota there are 11 organizations who serve as regional development commissions (RDCs), 10 of which serve rural areas. The RDCs were developed to provide technical assistance to the local units of government within each region. Services provided by RDCs include: community development, planning, grant writing/administration, economic development technical services, environmental services, housing services, small business loans, transportation planning, entrepreneurial training programs, business marketing, geographic information services (GIS), and many other services. Only the 10 RDCs located in rural areas contributed to the MIRC project in a variety of ways.

The Northwest Regional Development Commission serves Region 1, which includes Kittson, Marshall, Norman, Pennington, Polk, Red Lake, and Roseau counties. The Headwater Regional Development Commission serves Region 2, which includes Beltrami, Clearwater, Hubbard, Lake of the Woods, and Mahnomen counties. The Arrowhead Regional Development Commission serves Region 3, which includes Aikin, Carlton, Cook, Itasca, Koochiching, Lake, and St. Louis counties. The West Central Initiative Foundation serves Region 4, which includes Becker, Clay, Douglas, Grant, Otter Tail, Pope, Stevens, Traverse, and Wilkin counties. The Region 5 Development Commission serves Cass, Crow Wing, Morrison, Todd, and Wadena counties. The Mid-Minnesota Regional Development Commission serves Region 6E, which includes Kandiyohi, McLeod, Meeker, and Renville counties. The Upper Minnesota Valley Regional Development Commission serves Region 6W, which includes Big Stone, Chippewa, Lac qui Parle, Swift, and Yellow Medicine counties. The East Central Regional Development Commission serves Region 7E, which includes Chisago, Isanti, Kanabec, Pine, and Mille Lacs counties. The Southwest Regional Development Commission serves Region 8, which includes Lincoln, Lyon, Redwood, Pipestone, Murray, Rock, Nobles, and Jackson counties. Lastly, the Region 9 Development Commission serves Blue Earth, Brown, Faribault, La Sueur, Martin, Nicollet, Sibley, Waseca, and Watonwan counties.

The RDCs involved in the MIRC project were responsible for promoting the MIRC activities and services conducted within their respective regions. To accomplish this goal, the RDCs were to promote MIRC activities via media contacts, various convening activities, and referring other MIRC partners to the general public. Media contacts included advertising on television, radio, web presence, newspapers, and any other printed materials. The convening activities used to promote MIRC projects included consultations or presentations made to local leaders, businesses, and other members of the community.

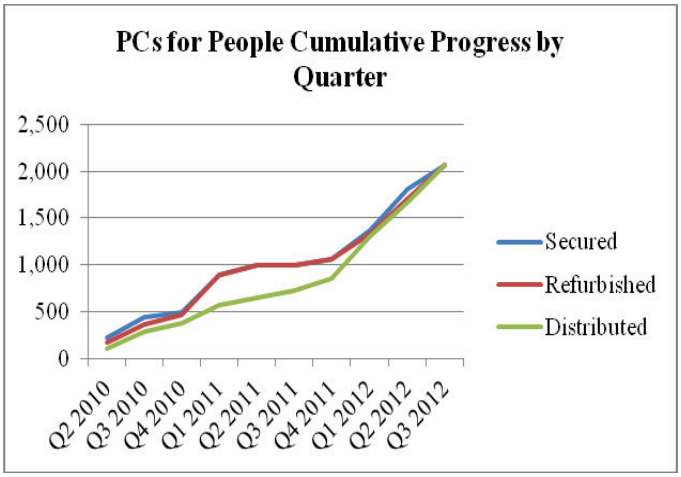
VI. MIRC Activities and Impact

As noted above, the MIRC project was implemented statewide through the coordination of a variety of partnering organizations that created a statewide footprint of activities. In this section we first examine these partners and their accomplishments and then examine the cumulative activities of the organizations combined.

PCs for People

At the completion of the MIRC project, PCs for People secured, refurbished, and distributed 2067 computers, which more than doubled their goal. Their efforts were widespread distributing computers in at least 65 counties including the demonstration communities. Of the 2067 computers going to low-income families 275 went to families located in the demonstration communities (Table 1). When factoring the families receiving these computers, PCs for People reports 5,876 people received computers with 3,184 of these being school-aged children.

Chart 4. PC's for People MIRC Activities



As one can see from the chart, PC's for People not only exceeded their goal of distributing 1,000 computers to needy families throughout rural Minnesota, but actually more than doubled their goal. Note that the distribution of PCs (the green line) started out slow, by the fourth quarter of 2011 they were distributed PCs at a rapid pace. PC's for people distributed computers to needy families all across rural Minnesota. As Tables 3 and 4 demonstrate, this included Demonstration communities and non-demonstration communities alike. In fact, they distributed their PCs to at least 65 of Minnesota's 87 counties.

Table 3. Number of Computers Distributed in Demonstration Communities

Demonstration Community	Computers Distributed
Benton County	7
Cook County	4
Itasca County	56
Kandiyohi County	108
Stevens County	21
Winona	32
Worthington	7
Upper Minnesota Valley	26

Table 4. Number of Computers Distributed in Non-Demonstration Counties

Non-Demonstration County	Computers Distributed	Non-Demonstration County	Computers Distributed
Aitkin	2	Morrison	3
Beltrami	85	Mower	76
Blue Earth	460	Nicollet	177
Brown	26	Olmsted	6
Carlton	3	Other	8
Chisago	5	Otter Tail	6
Clearwater	1	Pine	1
Crow Wing	5	Pipestone	2
Dodge	5	Polk	64
Douglas	56	Pope	11
Faribault	21	Red Lake	3
Fillmore	1	Redwood	6
Freeborn	5	Renville	2
Goodhue	83	Rice	87
Grant	4	Rock	1
Houston	8	Roseau	2
Hubbard	9	Sherburne	7
Isanti	42	Sibley	14
Jackson	1	St. Louis	88
Kanabec	1	Stearns	17
Koochiching	46	Steele	25
Lake	1	Todd	3
La Sueur	41	Traverse	2
Lincoln	2	Wabasha	3
Lyon	71	Wadena	1
Martin	85	Waseca	39
McLeod	47	Watonwan	12
Meeker	3	Wright	12
Mille Lacs	6		

Below are the socio-demographic characteristics of those families receiving computers through the MIRC project.

Table 5. Social and Economic Characteristics of Recipients

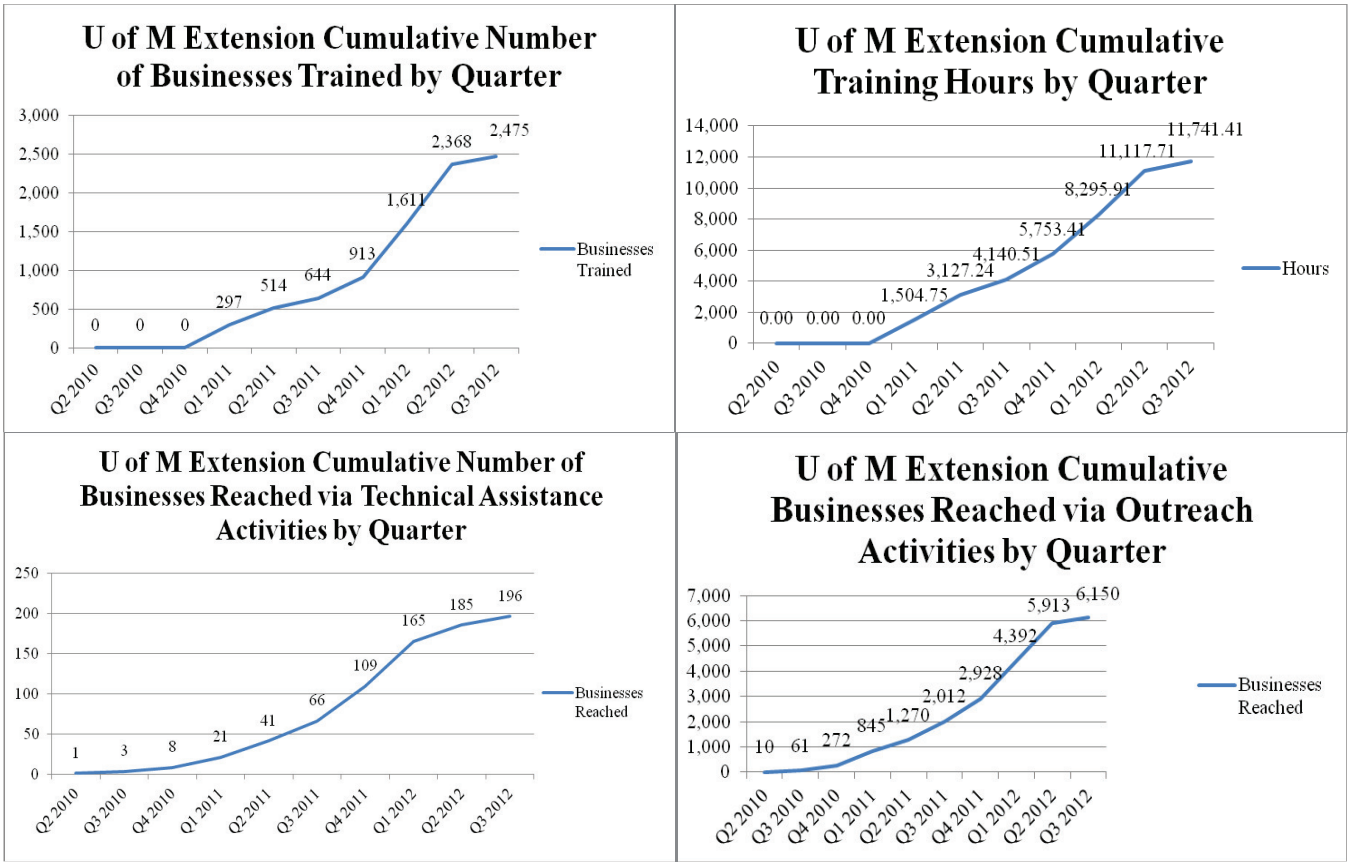
	Totals
Average Household Size	3.31
Average # of Children in Household	1.81
Average Household Income	$12,146.75
Employed	35.82%
Unemployed	64.18%
% of PCs to be Used for Job-related Activities	50.74%
% of PCs to be Used for Education-related Activities	66.55%
Caucasian	60.32%
African-American	19.77%
Latino/Hispanic	9.74%
Asian/Pacific Islander	1.94%
Native American	4.51%
No Response	3.68%

Table 6. Social and Economic Characteristics of Demonstration Community Recipients

	Totals
Average Household Size	4.17
Average # of Children in Household	2.49
Average Household Income	$13,507.89
Employed	36.15%
Unemployed	63.85%
% of PCs to be Used for Job-related Activities	60.92%
% of PCs to be Used for Education-related Activities	74.71%
Caucasian	34.48%
African-American	29.5%
Latino/Hispanic	11.88%
Asian/Pacific Islander	8.81%
Native American	12.26%
No Response	3.07%

U of M Extension

The University of Minnesota Extension was charged with multiple tasks on the MIRC project. In fact it is fair to say that they were part of the programmatic backbone of MIRC. Specifically Extension was charged with providing digital training to 2000 rural businesses; provide broadband outreach to 6,000 rural businesses; and provide direct technical assistance to at least 60 rural businesses.



Training:

As you can see from the charts above, the U of M Extension exceeded its training goal of 2,000 by providing these trainings to 2,475 rural businesses. Through their efforts they actually delivered more than 11,000 hours of digital training.

As noted earlier, in addition to training, the University of Minnesota Extension was charged with providing direct technical assistance to 60 rural businesses and outreach efforts to 6,000 rural businesses across the state. As you can see from the charts below, they exceeded those goals as well.

Lastly, Table 7 documents the characteristics of those businesses participating in activities offered through MIRC by the University of Minnesota Extension.

Table 7. Characteristics of Businesses Taking Part in U of M Extension's Education, Training, Outreach, and Technical Assistance Activities

	Totals
% of Businesses Involved Reporting:	
Had an Internet Connection	61.49%
Utilized a Broadband Connection	58.78%
Are Either Female or Minority-owned	17.71%
Average Number of Employees	75
% of Businesses Within Various Industries	
Accommodation/Food	11.48%
Administrative Services	2%
Agriculture	2%
Arts/Entertainment	6.28%
Construction	3.09%
Education	2.33%
Educational Services	0.11%
Finance/Insurance	6.99%
Health/Social	7.91%
Information	4.12%
Management	0.05%
Manufacturing	3.2%
Mining	0.05%
Other Services	13.43%
Professional Services	8.72%
Public Administration	4.82%
Real Estate	3.52%
Retail Trade	16.58%
Transportation	0.65%
Utilities	0.43%
Wholesale Trade	2.17%
Unclassified	0.05%

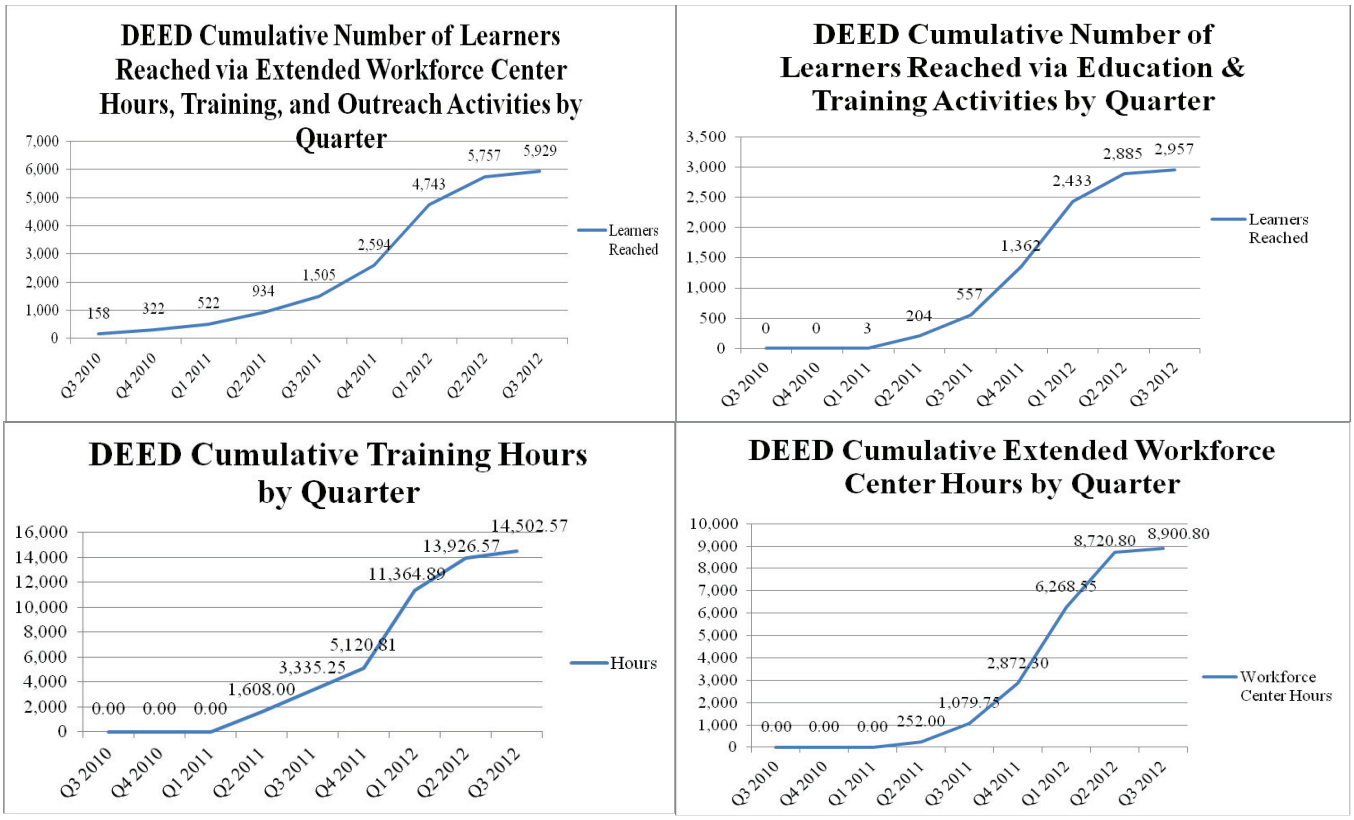
The Department of Employment and Economic Development

As noted earlier, DEED is Minnesota's state economic development agency. By using various programs, DEED works to "promote business recruitment, expansion, and retention; international trade; workforce development; and community development". DEED serves as a resource for job seekers, businesses, and local governments through its regional workforce centers across the state.

It is quite rare to have a state economic agency serve as a partnering organization for a broadband project such as this. For the MIRC project, DEED was charged to expand access to computer centers through its workforce across rural Minnesota. In addition, DEED was to coordinate with other MIRC partners to conduct digital literacy training and serve a total of 2,700 learners. DEED also conducted

outreach for MIRC by sending promotional materials which included: press releases, public service announcements, flyers, and the "captured promotional activity" which was printed shirts for the Leech Lake project. Lastly, ESL classes were also held to help immigrants develop the skills necessary to find employment in Minnesota.

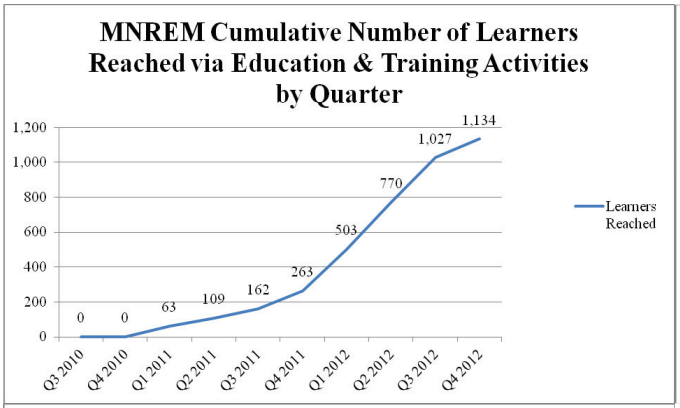
As you can see, the charts below document, like the U of M Extension, DEED exceeded its goal of reaching 2,700 learners across rural Minnesota, provided more than 14,000 hours of training and increased computer access by more than 8,900 hours.

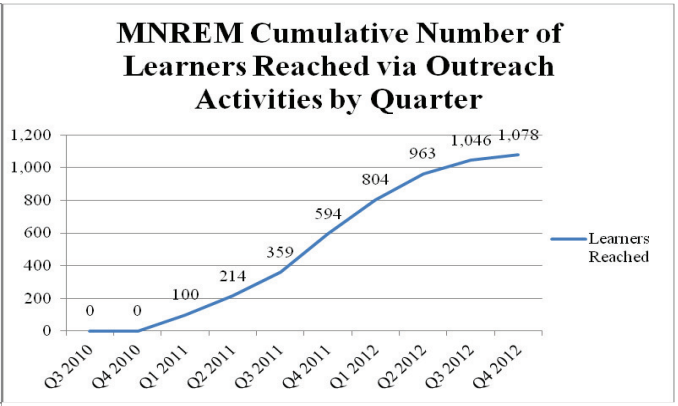


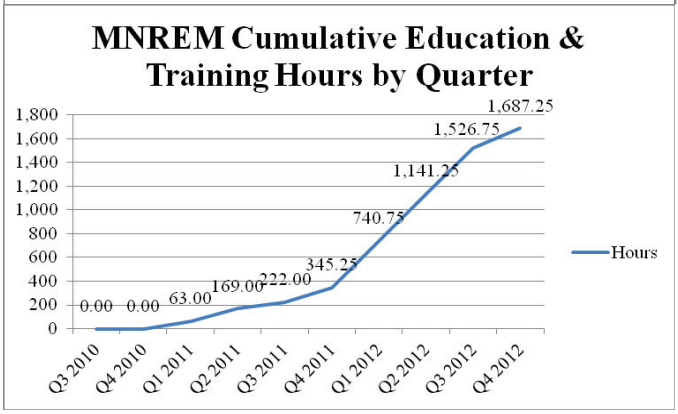
The Minnesota Renewable Energy Marketplace (MNREM)

MNREM is a not-for-profit organization initially created by a federal Department of Labor Wired Grant. Today MNREM is designed to boost innovation and support the development of new technologies in rural Minnesota. Ultimately, MNREM strives to retain, create, and attract a more educated and skilled workforce in rural Minnesota. As a partner, MNREM leverages existing resources to educate and train employees in rural renewable energy businesses.

For the MIRC project, MNREM was charged with designing curricula and other training resources on the use of broadband-based technologies and services to promote business vitality and growth. They also organized and conducted training for staff at participating workforce centers related to delivery of digital literacy. MNREM's goal was to deliver at least 1,500 hours of training and/or technical assistance related to broadband-based technologies and services to rural renewable energy businesses.





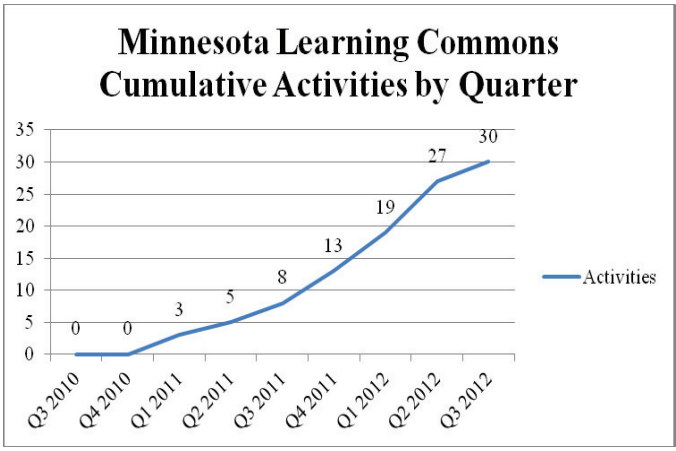


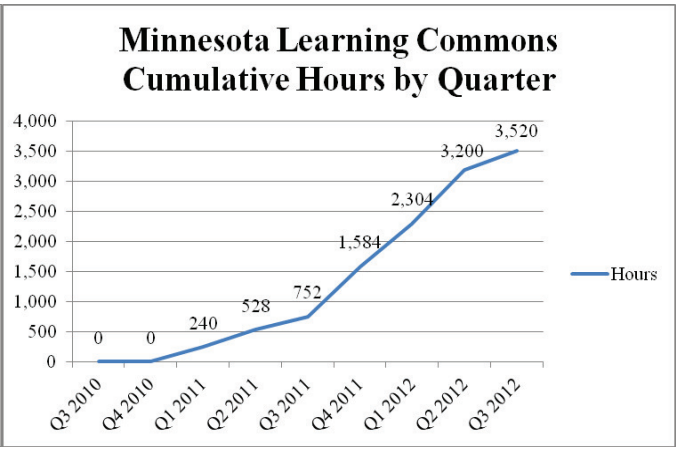
As one can see from these charts, MNREM provided almost 1,700 hours of training to the businesses it served. In doing so, MN reached 2,212 learners in these renewable energy businesses across rural Minnesota.

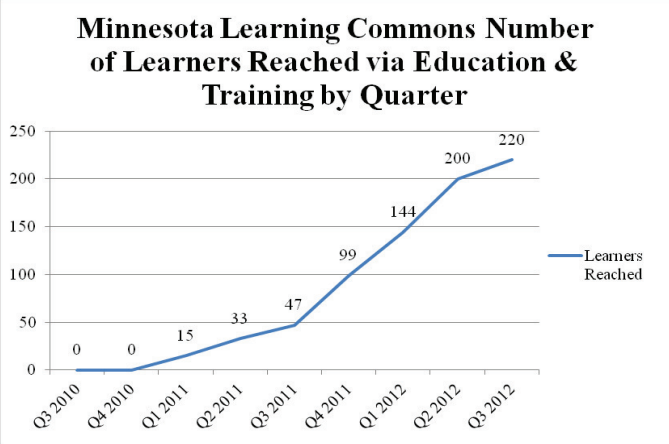
The Minnesota Learning Commons

The Minnesota Learning Commons was jointly established by the Minnesota State Colleges and Universities (MnSCU) and the University of Minnesota as an educational resource providing free online resources for public education. Their portal allows Minnesotans access to "effective and efficient online learning provided by Minnesota public education partners". The Minnesota Learning Commons has 3 goals: enhance relationships among their partners, deliver expanded access to online programs which meet the needs of all Minnesota learners, and establish a sustainable organization which increase access to public Minnesota "P-16" education. As a partner, Minnesota Learning Commons leveraged existing resources to create and deliver a Knowledge Worker course included in the MIRC project.

Minnesota Learning Commons was charged with creating this new curriculum designed as a 16 hour course for the unemployed, underemployed, dislocated workers, and employees. The goal was to deliver the 16-hour course a minimum of 16 times per year for 2 years, or a total of 32 times.

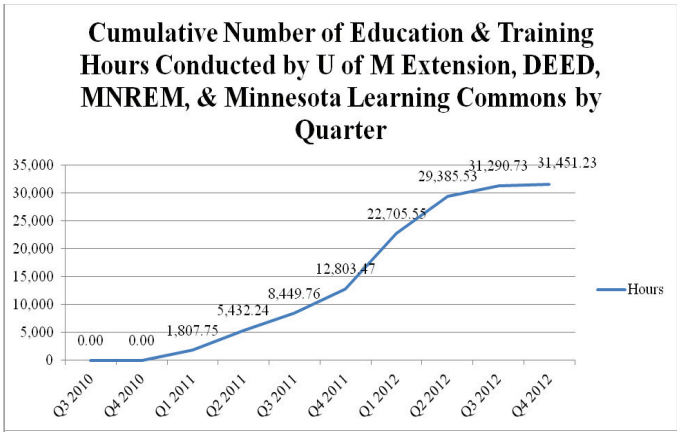


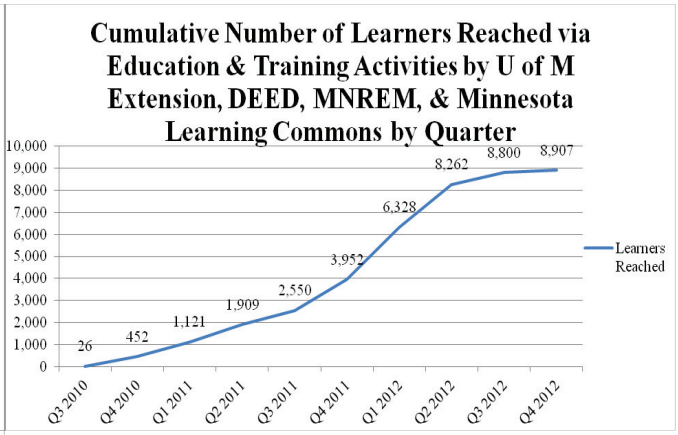


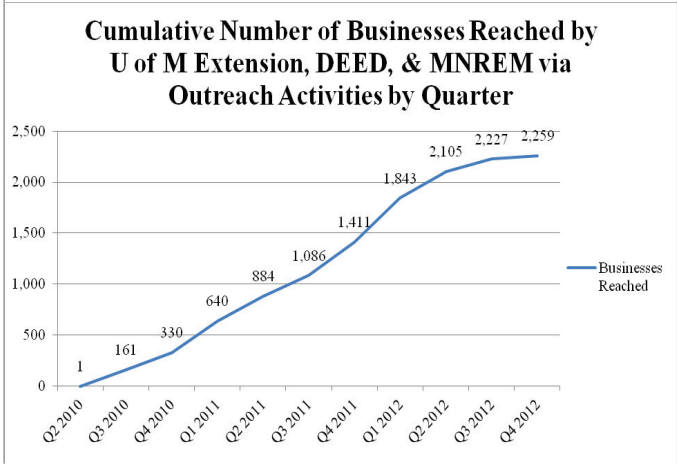


As one can see from this chart and the last two on the previous page, the Minnesota Learning Commons provided offered their innovative curriculum 30 times throughout the MIRC Project. In doing so, they offered over 3,500 hours of training and reaching 220 learners.

Cumulative Training and Outreach Activities by MIRC Partners

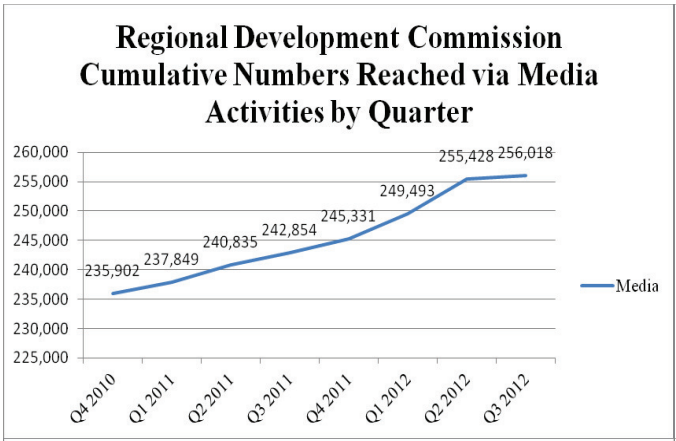


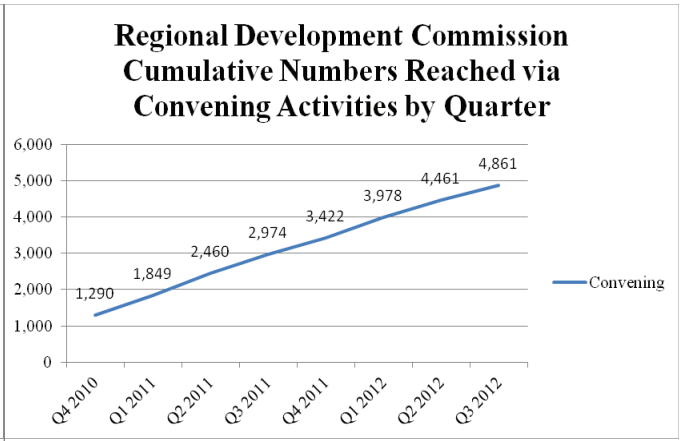


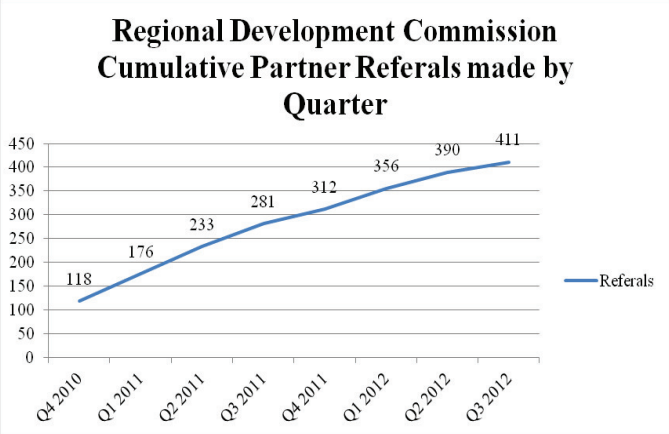


As one can see from these three charts, the MIRC partners together provided more than 31,000 hours of training to individuals and businesses reaching close to 9,000 learners in the process. In addition to the training activities, all of the MIRC partners were also involved in digital literacy outreach. These activities included providing outreach information through local radio, television and print media outlets; making presentations at conferences and workshops, and of course, providing information through web-based tools.

However, the majority of the outreach efforts were conducted by Minnesota's Regional Development Organizations. These regional entities spread across all corners of rural Minnesota conducted media and outreach activities all across the state. Below are the charts documenting the outreach efforts of the Regional Development Commissions, as well as the other MIRC partners.







As these charts demonstrate, the amount of outreach all across rural Minnesota was both impressive and unprecedented. In addition to the over 2,000 businesses reached by the MIRC training partners, the Regional Development Commissions reached over 250,000 households through their media events. In addition, they made presentations and convened groups reaching over 4,800 individuals. And equally important, these organizations served as regional referral offices to allow groups, individuals and businesses in their respective regions received MIRC-sponsored training by making referrals to these MIRC partnering organizations. As the chart documents, such referrals occurred more than 400 times.

Understanding the Broader Impacts

While much of the focus has been on the 11 MIRC Demonstration Communities, it is important to recognize the profound impact that the MIRC project has had on all of rural Minnesota. As noted throughout this section, a large percentage of the activities conducted by the partnering organizations actually occurred outside of the demonstration communities. For example, while PCs for people distributed 275 computers to needy families in the demonstration communities, it also distributed 1,792 computers to needy families throughout the rest of rural Minnesota. In other words, 87 percent of their work actually occurred outside of the Demonstration Communities.

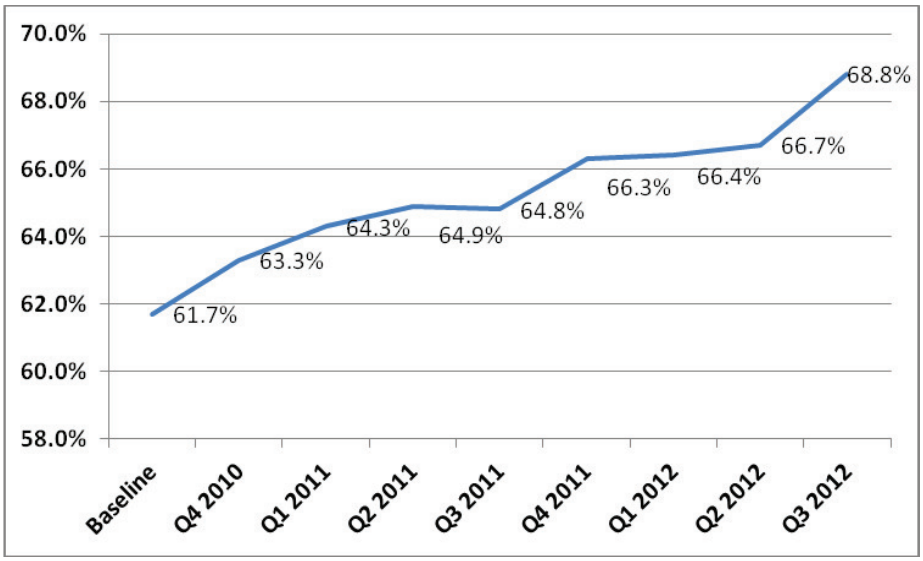
In fact, similar patterns exist for all of the partnering organizations. This was especially true for the awareness and media outreach conducted by the 10 Regional Development Organizations. As we documented, these organizations reached over 250,000 rural individuals through their outreach efforts in their respective region. However, it is important to note that some of these regions did not have a Demonstration Community located within the borders of their region. And in fact, it has been this type of broad and inclusive outreach that has made the project so successful. This is quite evident as we examine the impact of MIRC on new broadband subscriptions and adoption rates.

Moving the needle on Broadband

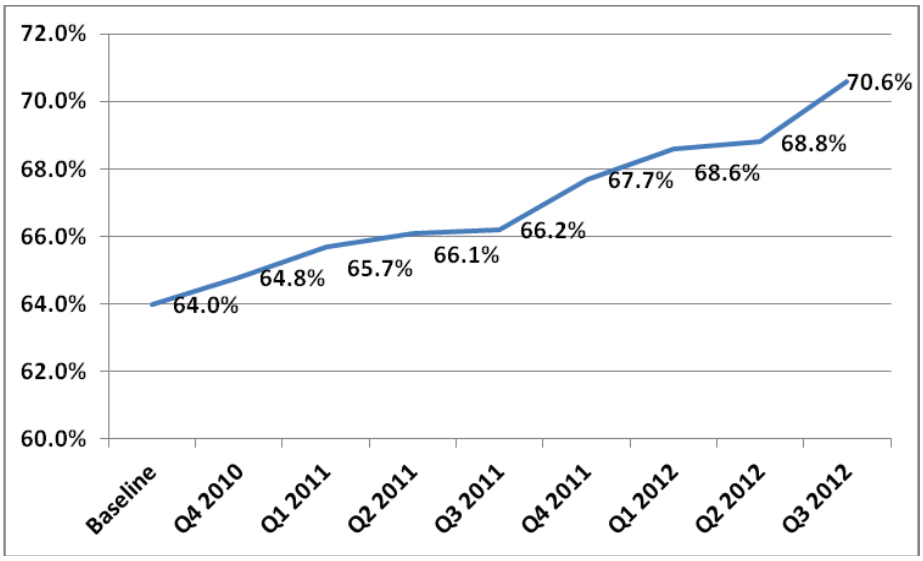
Of course, the primary goal of the MIRC project was to make a meaningful impact in the growth of new broadband subscriptions and adoption rates. As noted in the way we measured this by conducting

baseline surveys across all of rural Minnesota as well as in the 11 Demonstration Communities.

Adoption Rates in MIRC Communities – Baseline through End of Project



Adoption Rates in All Rural Minnesota – Baseline through End of Project



As one can see from the charts above, the 11 MIRC communities were collectively lagging behind the rest of rural Minnesota in the adoption of broadband (61.7% vs. 64%). The reasons for this were multiple, including many of the MIRC communities having a disproportionately high percentage of elderly residents; some communities (particularly tribal communities) having a high poverty rate; while others such as Cook County, simply had limited access to broadband. However, over the course of the project the trajectories were quite similar and in fact, by the end of the MIRC project, that gap had somewhat narrowed.

As one can see from the table below, while all the individual demonstration communities increased their number of broadband subscriptions and their adoption rates, they did not all advance at an equal

pace. Overall, the growth in broadband subscriptions throughout rural Minnesota grew at a pace of 10.31% during the MIRC project, increasing the overall adoption rate from 64% in 2010 to 70.6% toward the fall of 2012. However, as you can see, most of the MIRC communities actually increased their growth rate at a faster rate. In other words, while the MIRC communities began the project somewhat further behind the rest of rural Minnesota, their collective growth rate was close to 15 percent faster than the rest of rural Minnesota; thereby closing that gap somewhat.

Table 8. MIRC Demonstration Community Growth Compared to Rural Minnesota

MIRC Community	Baseline Rate	New Broadband Subscriptions	Growth in Subscriptions	Current Rate
Benton County	66.3%	849	12.66%	74.7%
Cook County	50.2%	187	15.90%	58.2%
Itasca County	63.3%	1284	11.40%	70.5%
Kandiyohi County	64.0%	1205	11.81%	71.6%
Leech Lake	48.8%	166	9.31%	53.4%
Stevens County	64.4%	270	11.19%	71.6%
Thief River Falls	59.4%	278	12.95%	67.1%
Windom	62.7%	145	12.13%	70.3%
Winona	69.2%	834	11.70%	77.3%
Worthington	53.9%	281	12.11%	60.4%
Upper MN Valley	57.6%	1173	10.26%	63.5%
Rural Minnesota	64.0%	56,663	10.31%	70.6%

VII. Factors Impacting Adoption across MIRC Communities

Baseline Adoption Rates

In 2010, phone interviews were conducted to determine baseline broadband adoption rate in the 11 demonstration communities and then followed up with the same communities in 2012. Initial adoption rates ranged from 48.8% in Leech Lake to 69.2% in Winona. To get a sense of the socio-economic factors which make up these demonstration communities, we put them into three categories according to their adoption rates. We classified the communities as “high adoption”, “medium adoption”, and “low adoption” (Table 9). The high adoption category consisted of Winona, Benton County, Stevens County, and Kandiyohi County. The medium adoption category consisted of Itasca County, Windom, Thief River Falls, and the Upper Minnesota Valley region. The low adoption category consisted of Worthington, Cook County, and the Leech Lake Band of Ojibwe. The average initial adoption rate of the high adoption category was 65.98%. The average initial adoption rate of the medium adoption category was 60.75%. The average initial adoption rate of the low adoption category was 50.97%. The average initial ICF score of each category follow the same pattern as the average initial adoption rate of each community. The high adoption communities had the highest average ICF score of 68.6. The medium adoption communities had an average ICF score of 64.61. The low adoption communities had the lowest average ICF score of 61.4.

Table 9. Baseline Adoption Rates for Demonstration Communities Separated into High, Medium, and Low Adoption Rate Categories

Community	Adoption Rate	ICF Score
High Adoption		
Winona	69.2%	71.6
Benton County	66.3%	66.38
Stevens County	64.4%	63.58
Kandiyohi County	64%	72.84
Medium Adoption		
Itasca County	63.3%	68.89
Windom	62.7%	65.51
Thief River Falls	59.4%	62.98
Upper Minnesota Valley	57.6%	61.04
Low Adoption		
Worthington	53.9%	59.44
Cook County	50.2%	64.51
Leech Lake Band of Ojibwe	48.8%	60.24

After categorizing the groups by adoption rate, we averaged six socio-economic factors for each community which are either known to impact broadband adoption or factors we would intuitively expect to impact broadband adoption: median income, percent of families in poverty, median age, percent of the population between the ages of 5 and 19, percent of the population 65 and older, and the percent of the population 25 and older who have taken some college classes or earned any undergraduate, graduate or professional degree (Table 10).

Table 10. Socio-economic Characteristics of Each Broadband Adoption Rate Category

	Avg. Median Income	Avg. % of Families In Poverty	Avg. Median Age	Avg. % of 5-19 Year Olds	Avg. % of 65 and Older	Avg. % of Pop. w/ Some College
High Adoption	$46,188	8.5%	33.6	21%	14.7%	58.4%
Medium Adoption	$42,241	9.7%	42.8	18.7%	19.7%	52.7%
Low Adoption	$45,303	13.6%	40.8	19%	16.9%	54.3%

What is evident in Table 10 is some linearity among the factors we would expect when comparing high, medium, and low adoption communities. For example, the high adoption communities had the smallest percentage of families in poverty while the low adoption communities had the highest percentage of families in poverty. We also see a linear relationship related to percentage of 5-19 year olds and percentage of 25 and older who have some college or higher. There is not much of a linear relationship between adoption rate and median income, median age, and percentage of population 65 and older.

Part of this lack of linearity on some socio-economic factors may be related to Cook County, which had the second lowest initial adoption rate (50.2%). Cook County is a unique community in that it has the smallest percentage of the population 5-19 years old (14.1%) but the 3rd highest percentage of the population 65 and older (20.3%). Cook County also has a high median income ($49,496) and very low percentage of families in poverty (5.5%). Cook County also has the highest percentage of 25 and older

residents with some college or higher. Residents of Cook County currently have little access to reliable broadband connections, especially as you move further away from Grand Marais. When this is accounted for and Cook County is removed from the low adopters group, there is much more linearity present in the socio-economic factors of the three adoption categories.

Broadband Growth

When examining the impact of the various MIRC projects across all demonstration communities, it was necessary to determine if the broadband adoption growth we are seeing is a function of socio-economic factors or the partner and community projects conducted within each community. With such a small number of communities observed (N=11) we separated the communities into three categories (high growth, medium growth, and low growth) based upon the communities' percent growth in broadband adoption over the past two years (Table 11). The "high growth" category is comprised of Cook County, Thief River Falls, and Benton County with broadband adoption growth ranging from 15.94% to 12.67%. The "medium growth" category is comprised of Windom, Worthington, Kandiyohi County, Winona, Itasca County, and Stevens County with broadband adoption growth ranging from 12.12% to 11.18%. Lastly, the "low growth" category is comprised of the Upper Minnesota Valley region and Leech Lake Band of Ojibwe with a broadband adoption growth of 10.24% and 9.43%, respectively. The average growth of the high growth category was 13.86%. The average growth of the medium growth category was 11.72%. The average growth of the low growth category was 9.84%. There is a similar growth pattern when we look at the growth of each category's ICF score over the past two years. The high growth communities had the highest average ICF score growth of 12.34%. The medium growth communities had an average ICF score growth of 10.17%. The low growth communities had the lowest average ICF score growth of 9.37%.

Table 11. Percent Growth in Each Demonstration Community Categorized into High, Medium, and Low Growth Communities

Community	% Growth	% ICF Score Growth
High Growth		
Cook County	15.94%	7.6%
Thief River Falls	12.96%	12.7%
Benton County	12.67%	16.71%
Medium Growth		
Windom	12.12%	19.26%
Worthington	12.06%	12.23%
Kandiyohi County	11.88%	2.59%
Winona	11.71%	4.32%
Itasca County	11.37%	7.97%
Stevens County	11.18%	14.82%
Low Growth		
Upper Minnesota Valley	10.24%	13.76%
Leech Lake Band of Ojibwe	9.43%	4.98%

In order to determine the extent socio-economic factors were affecting broadband adoption growth in

the demonstration communities, we collected information related to six socio-economic factors for each community that are either known to impact broadband adoption or factors we would intuitively expect to impact broadband adoption. These include: median income, percent of families in poverty, median age, percent of the population between the ages of 5 and 19, percent of the population 65 and older, and the percent of the population 25 and older who have taken some college classes or earned any undergraduate, graduate or professional degree. We then examined the average of these socio-economic factors across the three categories of broadband growth (Table 12).

Table 12. Socio-economic Characteristics of Each Broadband Adoption Growth Category

	Avg. Median Income	Avg. % of Families In Poverty	Avg. Median Age	Avg. % of 5-19 Year Olds	Avg. % of 65 and Older	Avg. % of Pop. w/ Some College
High Growth	$46,320	8.5%	40.5	17.7%	16.9%	58.7%
Medium Growth	$43,387	10.6%	36.9	20.2%	16.9%	54.6%
Low Growth	$45,171	12.1%	42.3	20.6%	18.2%	51.6%

With respect to the socio-economic factors of the communities, we do see some linearity in the table above. However, this linearity is not near as strong when communities are categorized by growth rate as when they were categorized by initial adoption rate. The linearity we see is only consistent with broadband adoption growth in three areas: percent of families in poverty, percent of the population 65 and older and percent of the population with some college or higher. The high growth category had the lowest percentage of families in poverty (8.5%), the lowest percentage of elderly (16.9%) and a more educated adult population (58.7%). Conversely, the low growth category had the highest percentage of families in poverty (12.1%), the highest percentage of elderly (18.2%) and the least educated adult population (51.6%). The other instance of linearity we see is not consistent with broadband growth: percent of the population between the ages of 5 and 19. We would expect to see higher growth within communities with a higher percent of school-age children. In this instance, we see the opposite: the high growth category has the lowest percentage of school-age children (17.7%) and the low growth category has the highest percentage of school-age children (20.6%). There was no linearity present in median age, median income, and percentage of the population below poverty. This indicates there is something else affecting broadband growth besides socio-economic factors alone.

In order to determine the impact of the various MIRC projects across the communities, we collected data to determine the awareness of community residents about any digital literacy projects in their community. Residents who responded that they were aware of any digital literacy projects indicated if they participated in any of the projects. If they did participate, they indicated how useful they believed the project to be on a scale of 1 to 10 with 10 being the most informative or useful. Each community outlined a number of projects conducted by local organizations which are outlined in Section 3. We then averaged the percent project awareness, percent project participation, the mean perceived usefulness, and the number of projects within the communities in each of the three broadband growth categories (Table 13).

Table 13. Awareness, Participation, Perceived Usefulness, and Number of Projects within Each Broadband Adoption Growth Category

	Avg. % Awareness	Avg. % Participation	Avg. Mean Usefulness	Avg. # of Projects
High Growth	38.2%	15.3%	6.71	8.67
Medium Growth	21.8%	12.6%	7.6	7.17
Low Growth	19.6%	7.8%	6.82	5.5

With respect to MIRC project impact, we see linearity in a higher percentage of project impact factors (3 of 4) compared to socio-economic factors (3 of 6). If the MIRC projects had an effect on broadband growth, then we would expect the high growth category to have higher awareness of digital literacy projects, higher use of digital literacy projects, a higher perceived usefulness of the projects and a higher number of projects within the communities. In the table above we clearly see linearity present in digital literacy project awareness: the high growth category has the highest percent of residents aware of projects (38.2%) while the low growth category had the lowest awareness (19.6%). We also clearly see linearity present in digital literacy project use: the high growth category residents who were aware of digital literacy projects used them at the highest rate (15.3%) while the low growth category reported the lowest use (7.8%). Lastly, we clearly see linearity in the average number of projects within the communities in each category: the communities in the high growth category had the highest average number of projects (8.67) while the communities in the low growth category had the lowest (5.5). The categories do not appear to differ in their perceived usefulness of the projects. Residents from communities in all three categories perceived the projects as fairly useful and informative.

While the data do not have statistically significant results, the results indicate the MIRC projects had an impact on broadband growth over the last two years. The high growth category demonstrated an average growth of 13.86% while the low growth category only grew an average of 9.84%. When examining the impact of socio-economic factors and the impact of the MIRC projects it does appear the projects had a bigger impact on broadband growth than socio-economic factors. Residents in high growth communities were more aware of digital literacy projects in their community and used them at a higher rate as well as were exposed to more digital literacy projects. However, the impact of socio-economic factors cannot be completely discounted. We do see that high growth communities have a smaller percentage of families in poverty, a smaller percentage of residents 65 and older, and have a higher percentage of residents 25 and older with some college experience or higher, which is consistent with broadband growth we would see without the MIRC project influence.

VIII. Summary and Conclusions

In 2010 the MIRC project embarked on a collaborative effort to advance broadband awareness, adoption and deployment across rural Minnesota. As evidenced in this document the project initiated approximately 100 community-based projects in the Demonstration Communities; distributed more than 2,000 computers to needy families; conducted over 31,000 hours of training to almost 9,000 individuals and over 2,000 small rural businesses; and cumulatively reached more than 250,000 rural Minnesotans through a coordinated public awareness campaign.

However, the most relevant question is to assess the impact of these activities. Simply put… does community intervention work? Clearly, based upon the data collected there is sufficient evidence to suggest that the answer is yes. As previously noted, baseline data on broadband adoption indicated that the collective adoption rate for the demonstration communities was lagging behind the rest of rural Minnesota. Further data collected in the baseline benchmarking study indicated that there was work to do. However, by the end of the 30-month project there was strong evidence that the gap was closing. In fact, data examining the growth in broadband adoption over the project period suggested that growth in those communities where intervention occurred grew close to 15% faster than the rest of rural Minnesota. And while such growth was insufficient to completely close that gap, the trend was unmistakable.

When examining the growth in adoption across the communities several observations are noteworthy. First, when examining the adoption rate at baseline it is apparent that the socio-economic and demographic factors that are well documented in the research impacting these rates (e.g., education, income, age) are significantly impacting adoption in the demonstration communities. Second, there appears to be congruity between the baseline adoption rates and the baseline ICF benchmarking scores. In other words, those communities that had the higher adoption rates at baseline also had the higher ICF scores as well.

However, these patterns are not as equally apparent when we examine the growth in broadband subscriptions in the demonstration communities. In fact, when examining the relationship between the growth rate in broadband over the past 30 months and these same socio-economic and demographic factors, the linearity trends are not as clear. On the other hand, when we examine the relationship between these growth rates and other factors related to the MIRC intervention, this linear relationship returns. For example, those communities that experienced the greatest increase in ICF scores also experienced the greatest increase in subscription growth.

Further as noted earlier, when conducting the second round of community surveys in 2012 community residents were asked about their awareness of various MIRC broadband activities occurring in their community. And if the respondent indicated they were aware of such activities they were also asked to indicate if they participated in any of the activities and how useful or helpful it may have been. This data was then correlated with broadband subscription growth and a very interesting pattern emerged. Specifically, those communities that reported the highest broadband growth rates also reported the highest percentage of awareness of broadband activities by their residents. Further, a similar pattern emerged regarding resident participation in these community-based broadband activities; where those communities that reported the highest rates of participation also experienced the highest rates of subscription growth.

Conclusion

Research has shown that there are two broad categories of factors that have an impact on broadband adoption and growth. The first category can be thought of as the socio-economic and demographic realities of the community. Factors such as age, educational attainment, the percent of school-age children, median family income and the percent of elderly residents are very familiar factors in the broadband literature. However, the primary problem with these factors is that they are generally thought of as immutable. The capacity to make meaningful and structural change to these factors is difficult.

However there is a second category of factors that can be thought of as intervention factors. These are activities that can occur in a community that could potentially impact changes in the adoption of broad-

band; and equally important, these factors are mutable. Accordingly, the focus of the MIRC project was on these mutable factors and activities such as the provision of digital literacy training; public awareness; the distribution of computers to needy families; and direct digital assistance to small rural businesses.

As the data suggests in this study, these immutable factors were quite influential when examining the community broadband adoption rate at baseline, however these observed linear patterns were less clear when examining their relationship to broadband growth over the past 30 months. However, there was clear linearity when examining the relationship between broadband growth and both the awareness and participation in MIRC broadband activities. In other words, those communities that experienced the fastest growth over the past 30 months also reported higher percentages of awareness and participation in MIRC activities.

Such evidence allows us to conclude that overall … intervention works.