



The Return from Investment in Broadband Infrastructure and Utilization Initiatives

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Produced by Strategic Networks Group, Inc.

A report commissioned by the Blandin Foundation to support the work of rural communities across Minnesota and beyond.



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This document was prepared for Blandin Foundation by Strategic Networks Group, Inc. (SNG).

Blandin Foundation’s mission is to strengthen rural Minnesota communities. The Foundation partners with rural Minnesota communities to advance high-speed Internet access, adoption, and effective utilization in their communities for residents and businesses.

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Introduction

Community and regional leaders across Minnesota increasingly recognize that the Internet is **the** indispensable infrastructure of our age. To ensure a high quality of life and a globally competitive future for all Minnesotans, these broadband champions need more advocates -- from Main Street to St. Paul -- to join their ranks.

Recognizing this as a moment of opportunity in Minnesota, Blandin Foundation commissioned Strategic Networks Group (SNG) -- a firm that has conducted broadband research within twelve states, across Canada, in Australia, and Europe -- to help demonstrate the potential of moving Minnesota to a place of prolific connectivity and utilization of broadband-enabled services and applications by the state's businesses and households.

The purpose of this white paper is to provide Blandin Foundation and its stakeholders with an objective analysis that is illustrative of the potential economic benefits from investment in enabling broadband infrastructure and in promoting the increased utilization of Internet-enabled applications and processes.

To accomplish this analysis, SNG has applied its proprietary scenario-based approach to modeling the direct impacts of increased broadband utilization, using over 21,000 records from SNG has collected directly from small and medium sized businesses from across the United States.

| Background |

In 2009, the Minnesota State Legislature adopted a goal of statewide broadband access of at least 10-20Mb download and 5-10Mb upload by 2015. However, nearly one-third of Greater Minnesota still lacks access to speeds of 10Mb download and 6Mb upload. Approximately 50% of rural Minnesota households lack a wired broadband connection that meets the state broadband speed goals. This is noteworthy because many communities across Minnesota continue to face economic development challenges.

A recent Moody's Analytics report from October 2013 notes that the "increasing divergence" between economies of the Twin Cities and Greater Minnesota is one of the state's top three economic weaknesses and cautions about the impact of strong secondary drivers in rural areas and the potential that these areas will face "the risk of returning to recession as jobs and residents flock to the Twin Cities."¹

Broadband connectivity is among the important tools for economic development that planners and policy makers must consider when they ponder the potential of "secondary drivers" for economic development across the state.

Given the broadband connectivity gap and economic challenges facing Greater Minnesota, policy makers and community leaders need to understand the economic benefits of ubiquitous broadband access throughout the state.

Toward generating and leveraging a greater awareness of the potential of economic development enabled through broadband access, the Blandin Foundation commissioned SNG to illustrate the potential of moving Minnesota to an economy of prolific broadband connectivity.

CONTEXT FOR INVESTING IN BROADBAND

The term "*broadband*" is generally used to describe almost any always on, high speed connection to the Internet. Broadband provides the platform for innovation and communication for 21st century communities and their citizens.

How does broadband relate to economic development?

- **Access, Adoption, and Utilization are not the same concepts** - Just because people have access to broadband infrastructure does not mean people are connected to the network; just because people have adopted broadband does not mean they are using the available Internet-enabled solutions that increases their productivity and business competitiveness.
- **It is not just about investing in broadband infrastructure, but driving utilization** – Not only is driving utilization critical to network sustainability, it is foundational to realizing full economic and community benefits from the network investment.
- **Bolstering rural economies** – Broadband is essential infrastructure for effective participation in the economy for urban and rural areas alike, with adoption driven by personalizing the value of broadband to individual businesses, organizations and households.
- **A broadband lifecycle approach** – Maximum returns on broadband investments require looking beyond the supply-side to make sure that each step of the process is addressed with a holistic planning approach. This is accomplished by building access, encouraging adoption, and tracking utilization, focusing on the demand-side of broadband and understanding how individual businesses, organizations and households are using the network.

¹ "The Twin Cities have long been the state's economic epicenter, but the gap between Minneapolis-St. Paul and the rest of [Minnesota] is widening. The metro area accounted for the entirety of statewide employment gains in 2013...The rest of the state, meanwhile, has struggled with unsteadiness in manufacturing and agriculture. Absent strong secondary drivers, rural areas face the risk of returning to recession as jobs and residents flock to the Twin Cities." Moody's Analytics report - Oct 2013.

Broadband infrastructure is essential for the effective participation of businesses and organizations in today's economy. Investments in broadband infrastructure strengthen regional economies by improving skills, competitiveness, and service delivery, thus enhancing the local business environment. Some examples include:

- **Education** – Bring dynamic resources into the classroom while enabling seamless communication and partnering among teachers, students and parents.
- **Health Care** – Create shared services that reduce operating costs and provide patients with a broader spectrum of enhanced services, including remote routine in-home consultations, diagnostics, administration, scheduling, and electronic patient records.
- **Public Safety and Emergency Response** – Connect response teams with vital information that improves coordinated, timely reaction to accidents and disasters, and offering citizens access to the information and tools they need to make decisions and seek support.
- **Citizen and Social Services** –Extend service reach and quality via online services to save time and public money while improving overall efficiency through services like smart grid technology and platforms to communicate and collaborate.
- **Economic and Workforce Development** – Improve regional competitiveness through efficient business practices and models that increase revenues, reduce costs and improve customer service by being online to allow businesses to be anywhere and serve customers everywhere.
- **Rural and Regional Development** – Attract and retain innovative businesses to allow the local economy to become more competitive, diverse, resilient, and resistant to economic shocks, as well as provide well-paying, high-quality jobs.

We no longer ask, *“Is broadband good for our community or region?”* because there is a growing, almost universal recognition – and significant evidence – that broadband is critical for economic vitality and community well-being. In many economies, the availability of broadband is a minimum condition for economic competitiveness, and this need is particularly acute for rural and remote economies.

The current lack of access to fiber-based broadband should be perceived as a weakness. At the same time, addressing this deficit should be considered a tremendous opportunity, especially for rural and non-urban Minnesota. Broadband is clearly identified by Minnesota regional economic development agencies as infrastructure initiatives that encourage job growth and business expansion.²

Proliferation of broadband access and utilization is a core part of Minnesota's regional economic development agencies' goals. A scan of these organizations highlight a number of initiatives designed to promote availability and use of broadband technology as a cornerstone of community building, business support, and talent development. Almost universally, economic development agencies have broadband access as one of their priorities, highlighting the need to improve, maintain and finance broadband infrastructure in support of economic development and a globally competitive Minnesota economy.

People are now asking, *“How much benefit does broadband bring to citizens, businesses, and communities?”* and they are focusing on *“How can we maximize those benefits?”* These are the right questions to ask and this white paper illustrates these in the context of driving broadband utilization in two counties in Minnesota.

PURPOSE AND SCOPE OF WHITE PAPER

The purpose of this white paper is to provide Blandin Foundation and its stakeholders with an objective analysis that is illustrative of the potential economic benefits from investment in enabling broadband infrastructure. The white paper will also illustrate the importance in promoting the increased utilization of Internet-enabled applications and processes - together known as “eSolutions.”

² Source : The Upper Minnesota Valley Region Comprehensive Economic Development Strategy - 2013-2017. And: 2014 Comprehensive Economic Development Strategy (CEDs) - Annual Update East Central Regional Development Commission.

To accomplish this analysis, SNG has applied its proprietary scenario-based approach to modeling the direct impacts of increased broadband utilization among a suite of potential eSolutions that have been tracked by SNG, leveraging over 21,000 records from Small and Medium Enterprises (SMEs) surveyed across the United States. Through this approach, SNG is able to illustrate the direct economic impact of new investment in broadband infrastructure and utilization initiatives on Minnesota’s economy.

To project impacts for this impact analysis, two geographic regions and three industry sectors were selected.

Selected Regions for Impact Analysis

The following areas were selected by Blandin Foundation to illustrate the economic impacts (direct and indirect) on GDP, jobs, taxes from increased broadband access, and utilization:

- Lac qui Parle County, a county connected with 100% broadband coverage³
- Kanabec County, a county that has unserved and underserved regions (only 27% broadband coverage), is representative of many rural areas in Minnesota where high network costs relative to low subscriber base limit private sector broadband infrastructure investment⁴

These two regions are examined in terms of the direct economic impact of increasing broadband utilization to move the county from an average level of eSolutions (based on SNG research) to a higher level of eSolutions. In addition, the direct economic impacts are estimated for new utilization of broadband in Kanabec County by increasing broadband coverage to 100%.

Selected Industry Sectors for Impact Analysis

The three industry sectors⁵ analyzed in this white paper are:

- Manufacturing
- Professional and Technical Services
- Retail Trade

The rationale for focusing on these industry sectors are described in Appendix A.

The table provides a summary of the above industry sectors in terms of their relative share of employment and number of businesses statewide and for each region of consideration (Lac qui Parle, and Kanabec).

Industry	Minnesota: Share of...		Lac qui Parle: Share of...		Kanabec: Share of...	
	Businesses	Employment	Businesses	Employment	Businesses	Employment
Retail trade	11%	6%	20%	15%	15%	16%
Professional and Technical Services	13%	12%	5%	1%	6%	3%
Manufacturing	5%	11%	5%	19%	6%	18%

³ As defined by Connect Minnesota. <http://www.connectmn.org/>

⁴ Where the business case ends for investing in broadband infrastructure (e.g. rural areas), the ‘economic case’ for public investment can be made when economic benefits (increases in GDP, jobs, and tax base) offer a positive ROI to the region.

⁵ For more about NAICS codes, see: http://www.bls.gov/iag/tgs/iag_index_naics.htm

§ Economic Impact Analysis §

BROADBAND IMPACT ANALYSIS MODELING SCENARIO

For purposes of this white paper, the economic impact analysis focuses on business establishments with fewer than 250 employees. The reasons for focusing on this size of business are:

- Small and Medium Enterprises (SMEs) form the majority of businesses, especially in non-urban areas (99% statewide in Minnesota)
- SMEs are a primary engine for job growth and provide the greatest opportunity for increasing utilization of eSolutions
- SMEs, especially small enterprises, are fertile ground for influencing utilization of eSolutions for productivity and competitiveness

The industry sector profiles for each region form the basis for analysis of the economic benefits from broadband utilization:

Sector	Number of establishments (fewer than 250 employees) ⁶		
	Minnesota	Lac qui Parle	Kanabec
Manufacturing	7,071	10	19
Professional & Technical Services	16,375	9	18
Retail Trade	19,287	38	45

Both Lac qui Parle and Kanabec counties are rural and relatively small in terms of total business establishments (191 and 295, respectively) and total employment (1,945 and 3,188, respectively).⁷

Based on SNG research, the eSolutions below are considered for increasing utilization for each sector⁸:

Manufacturing	Professional & Technical Services	Retail Trade
Selling goods or services	Selling goods or services	Selling goods or services
Web site for organization	Web site for organization	Web site for organization
Advertising and promotion	Advertising and promotion	Customer service and support
Customer service and support	Customer service and support	Deliver services and content
Supplier communication and coordination	Teleworking	Social networking
Staff training and skills development	Deliver services and content	Staff training and skills development
Teleworking	Social networking	Accessing collaborative tools

⁶ Source: US Census Bureau – County Business Patterns 2011

⁷ Source: US Census Bureau – County Business Patterns 2011. Totals do not include public administration as these are not reported in USCB CBP data.

⁸ A list of eSolutions that SNG tracks on business utilization is provided in Appendix D.

The seven eSolutions were selected for each industry based on the following criteria:

- They represent the lowest current utilization levels and, therefore, the greatest opportunity for increasing utilization
- They have high relevance to each industry
- They provide a significant opportunity for impacting revenues and/or cost savings

While the top seven eSolutions are identified for each industry, it is not expected that every business will adopt all of these seven eSolutions. Not every business will recognize the need for each eSolution for their particular business (e.g. teleworking may be more applicable to some businesses than others) and from a practical standpoint, individual businesses may not have the capacity to take on new eSolutions. Therefore, the impact analysis assumes that no business will adopt more than three of the seven eSolutions initially, as a conservative estimate.

Based on the current utilization levels for each eSolution for each industry, the number of new eSolutions being used and number of businesses using new eSolutions are estimated based on a 20% increase in utilization⁹ by those not currently using each eSolution. In other words, one in five businesses not currently using each eSolution will start to use eSolutions to increase their productivity and competitiveness.

The above criteria should be incorporated for an effective broadband investment initiative, which includes investment in infrastructure (reliable connectivity is clearly a necessary condition), as well as programs to educate, raise awareness, and encourage adoption and utilization of eSolutions among businesses.

⁹ A 20% participation rate in a program (i.e. one in five businesses approached participate) to drive broadband utilization is conservative, but realistic.

ESTIMATES OF DIRECT INCREMENTAL¹⁰ IMPACTS FROM BROADBAND

The direct economic benefits for each region are calculated from SNG’s model in terms of additional revenues, and cost savings are provided in the following tables. The calculations of direct impacts are based on annual revenues and annual impacts.

The tables below show the incremental (new) revenue, costs savings, and total incremental impact for the three industry sectors under consideration.

Lac qui Parle County Impacts

Lac qui Parle has 100% broadband coverage so these economic impacts are based on increasing utilization of eSolutions by existing business broadband users. The investment needed to realize these impacts is estimated at \$120,000 to \$145,000¹¹ for driving broadband utilization with businesses in the targeted industry sectors.

The incremental impacts for Lac qui Parle County are provided in the following table.

Incremental Revenues and Savings From New eSolutions – Lac qui Parle County				
Industry	Total All Businesses	Incremental Revenue from new eSolutions	Incremental Cost Savings from new eSolutions	Total Incremental Impact
Manufacturing	10	\$429,000	\$40,000	\$469,000
Professional & Technical Services	9	\$66,000	\$2,000	\$68,000
Retail Trade	38	\$725,000	\$34,000	\$760,000
TOTAL	57	\$1,220,000	\$77,000	\$1,297,000

As show, businesses in Lac qui Parle County could see new revenues of over \$1.2 million and cost savings of over \$77,000, for a combined impact of nearly \$1.3 million.

¹⁰ The term incremental refers to “new” impacts – those impacts that are net of those that are currently occurring within the economic system. There are the portion of total impacts that are attributable to the catalyst being examined, in this case, the initiative that causes broadband utilization to take place to the degree that we have assumed in our analysis (e.g., current users adopt 3 more eSolutions and 1 in 5 businesses not using broadband become users of broadband and employ eSolutions).

¹¹ Driving utilization for targeted businesses in Lac qui Parle County includes outreach and engagement with businesses, training and support, and coordination by local / regional economic development agencies. To be successful, this effort would need to be appropriately resourced and accompanied by an appropriate strategy to maximize benefits and accelerate the rate at which these benefits accrue.

Kanabec County Impacts

As Kanabec County has only 27% broadband coverage, the projected impacts are based on:

- Increased utilization of eSolutions by existing business broadband users
- Utilization of eSolutions by new adopters of broadband (the other 73%)

The investment needed to realize these impacts is estimated at:

- \$11.3 million for fiber to the home (FTTH) infrastructure (or \$7.3 million for fiber / wireless hybrid)¹² to have 100% broadband coverage in Kanabec County
- \$175,000 to \$225,000¹³ for driving broadband utilization with businesses in the targeted industry sectors.

The direct incremental impacts for Kanabec County are provided in the following table.

Incremental Revenues and Savings From New eSolutions – Kanabec County				
Industry	Total All Businesses	Incremental Revenue from new eSolutions	Incremental Cost Savings from new eSolutions	Total Incremental Impact
Manufacturing	19	\$7,987,000	\$1,264,000	\$9,251,000
Professional & Technical Services	18	\$1,404,000	\$100,000	\$1,504,000
Retail Trade	45	\$8,840,000	\$802,000	\$9,642,000
TOTAL	82	\$18,231,000	\$2,166,000	\$20,397,000

As shown, businesses in Kanabec County could see new revenues of over \$18 million and a cost savings of over \$2.1 million for a combined impact of nearly \$20.4 million.

The impacts for Kanabec County are much higher because the scenario as described includes increasing access by increasing broadband coverage from 27% to 100%, and then focusing on adoption of broadband service and utilization of eSolutions, whereas Lac qui Parle County was only looking at incremental impacts from increased utilization.

In other words, Lac qui Parle already has 100% broadband coverage, so the impacts are based on increasing utilization of eSolutions by existing business users. Kanabec County has 27% coverage, so the impacts are based on both:

- Increasing utilization of eSolutions by existing business broadband users
- Increasing utilization of eSolutions by new adopters of broadband

As a result, Kanabec County shows a much higher economic impact.

¹² Source: Robust Broadband Network Feasibility Study - Bringing Robust Broadband Networks to Kanabec County, MN, 2012. U-reka Broadband Consultants.

¹³ As with Lac qui Parle, driving utilization for targeted businesses in Kanabec County includes outreach and engagement with businesses, training and support, and coordination by local / regional economic development agencies, appropriately resourced.

TOTAL INCREMENTAL IMPACTS

The direct incremental impacts associated with the assumptions of new eSolutions applied among current adopters and non-users transitioning into use of eSolutions become an input to our analysis of economic impacts.

The foundation for this is not a custom input/output analysis, rather it is an illustrative assessment of the potential direct, indirect, and induced impacts based on past SNG research. The statistics identify the following economic impacts:

- Employment – The impact on employment, measured in person years¹⁴,
- Household Income – The impact on wages associated with the person years of employment.
- Gross Domestic Product (GDP) – Changes in GDP at market prices.
- Tax Effects – Changes in local, state, and federal tax revenues resulting from the increased economic activity.

Direct impacts from increased utilization of eSolutions result in the following economic **total impacts**:

Within the Lac qui Parle County, the combined impacts generate nearly \$530,000 in household income, create or help sustain 22 positions, \$1.4 million in GDP, and almost \$150,000 in tax revenues, annually – which is greater than the one-time public investment cost of \$120,000 to \$145,000 to drive broadband utilization.

Incremental Impact From New eSolutions – Lac qui Parle County				
Sector	Household Income	Total Employment	Total GDP	Total Tax
Manufacturing	\$106,000	4	\$386,000	\$46,000
Professional & Technical Services	\$25,000	1	\$90,000	\$11,000
Retail Trade	\$398,000	16	\$950,000	\$91,000
TOTAL	\$529,000	22	\$1,426,000	\$148,000

Within Kanabec County, the combined impacts generate just over \$6.6 million in household income, create or help sustain over 310 positions, contribute \$21.6 million in GDP, and generate over \$2.3 million in tax revenues, annually – which is greater than the one-time public investment cost of \$175,000 to \$225,000 to drive broadband utilization.

Incremental Impact From New eSolutions – Kanabec County				
Sector	Household Income	Total Employment	Total GDP	Total Tax
Manufacturing	\$1,784,000	84	\$7,618,000	\$914,000
Professional & Technical Services	\$479,000	22	\$1,976,000	\$252,000
Retail Trade	\$4,342,000	204	\$12,050,000	\$1,153,000
TOTAL	\$6,605,000	310	\$21,644,000	\$2,319,000

¹⁴ A person year is equal to 2,000 hours and defined as a full-time equivalent position (FTE). FTEs are calculated on the basis of annual per capita salaries, by county.

HOUSEHOLD BENEFITS FROM BROADBAND

A key benefit of broadband for households is the ability to effectively and productively telework or operate a home-based business. While some households do telework or operate a home business without broadband (largely due to broadband unavailability), the percentage of households teleworking or operating a home business is significantly higher when broadband connections are used by the household, according to SNG's research.¹⁵

	Percent of Dial-up Households	Percent of broadband households	Overall percent of households
Home Business	9.1%	16.7%	16.4%
Teleworking	4.2%	15.7%	15.3%

Based on research averages, the opportunity for increased income and employment opportunities through home business and/or teleworking translates into the following for Minnesota and the two counties. County estimates are adjusted for a population demographic of people under 65 years of age.

	Total Households	Home Business Households (est.)	Teleworking Households (est.)
Minnesota statewide	2,361,352	387,262	361,287
Lac qui Parle County	3,681	530	494
Kanabec County	7,825	330	308

Home-based businesses create an opportunity to evolve into business establishments outside of the home environment and become sources of additional future employment. In addition, broadband connectivity that enables effective teleworking creates new employment opportunities for households and opens up additional labor forces for employers regardless of location. For example, increasing broadband coverage to 100% in Kanabec County could enable an additional 890 home businesses and 830 teleworking households in the county.

While there are many other factors that will influence the creation of home businesses and finding teleworking employment opportunities, there is no doubt that broadband access is essential for both. Recent US surveys by SNG indicate that over 75% of home business owners say that broadband access is essential to operate their business, including those that do not currently have broadband access. Close to 30% of home businesses strongly agree that they would have to relocate to get broadband access if it was not available. This has clear implication for both attracting and retaining households in communities.

The implications for teleworking households are equally significant in relying on adequate broadband connectivity. The same SNG findings from the US suggest that a third of teleworkers strongly agree that they would not have their current job if they were not able to telework, and over one in five strongly agree that their ability to telework has helped them avoid relocation for employment. As a result, almost 30% strongly agree that they spend more locally within the community by working from home.

Where teleworking occurs, it contributes to additional employment within these communities, enabling people to live and work in their community of choice. Over 44% say that teleworking is very important for opening up more employment opportunities while 73% cite improved life-work balance as a very important benefit of

¹⁵ SNG broadband impacts database includes 12,500 households from five different states. All data presented in this section are based on over 5,400 data points, collected by SNG in 2012 across Illinois and Kentucky.

teleworking. Clearly, the success of telework promotion and enabling strategies in Fergus Falls provides a case study for the benefits of broadband-based telework.

Because of all of its benefits to households, broadband is a significant factor on attracting and retaining populations and households in communities. Over 30% of households say that they would definitely (19.6%) or very likely (21%) relocate to another community in order to get broadband services. This means that communities that can offer reliable broadband access tend to be relatively more attractive to businesses and residents.

Broadband, in this context, becomes a tool for business recruitment as well as attracting newcomers and in a world where individuals can literally choose to work and live anywhere. Broadband therefore, is an important tool in a community's sustainability strategy.

! Conclusion !

Our assessment of the range of benefits that could accrue to Minnesota from additional investment in broadband access and utilization looked at real-world data from other states and essentially asked the questions, *“What if existing business users added up to three more eSolutions to their existing approaches to leverage broadband?”* and *“What if one in five of those businesses who are not currently connected became connected and adopted a range of eSolutions for their business?”*

For an individual business, the change is significant – revenue is expanded through increased market reach and lower cost, 24/7 customer access to sales, product information and online purchases, as well as measureable costs savings through more efficient transaction speeds, better management of inventory and sales, among other operational efficiencies.

To help illustrate the in-state impacts of increased investments in broadband access and utilization we looked at Lac qui Parle and Kanabec Counties. For Lac qui Parle, which already enjoying 100% coverage, the impacts we estimated are based on increasing eSolutions among existing broadband users. For Kanabec County, with 27% coverage, the impacts we estimated are based on combined impacts of increasing utilization of eSolutions among existing broadband users, and encouraging non-users to become new adopters of broadband. The comparison between the two counties shows the impact potential of influencing both new utilization and expanding eSolutions utilization among existing broadband subscribers.

Our analysis shows that the potential return from an investment in broadband in the counties of Lac qui Parle and Kanabec, within the scenarios considered, are illustrative of and on par with findings from SNG’s research into actual experiences in other jurisdictions. From past SNG research, the required investment to achieve measureable results is on the order of \$120,000 to \$145,000 for La qui Parle and \$175,000 to \$225,000 for Kanabec. This level of investment would provide sufficient resources to mobilize an effective outreach, awareness, and utilization program that would be targeted to expanding effective and efficient use of eSolutions.

At this level of investment, a leverage effect of as much as 10 to 1 can be anticipated, so that for a \$1 investment, \$10 is returned in direct and spinoff impacts to the local economy.

Furthermore, when there is an existing broadband network, the Tax Effect¹⁶ from driving broadband utilization would be net positive, with a ratio of 1.03 to 1.25 greater returns in tax revenues than the public investment made.

¹⁶ Tax Effect: changes in local, state, and federal tax revenues resulting from the increased economic activity due to public investment.

SUMMARY

In summary, within this white paper, SNG has:

- Identified key economic sectors where an increase in utilization will improve the economic health of the county and region
- Provided the evidence-based estimates of the type and scale of economic impacts to key industry sectors that can be realized from improved broadband utilization by businesses
- Provided fact-based information that will help leadership gain a metrics-based understanding of the potential of broadband investments that increase access, adoption, and utilization
- Targeted the analysis to Small and Medium Enterprises to highlight the potential through similar companies that local and regional economic developers, planners, and policy makers are most likely to influence.
- Based scenarios around the same companies whose decision makers are locally based, with company owners and managers who live and work within the communities that Blandin Foundation is actively engaged to support these communities' efforts to thrive.

RECOMMENDATIONS

Recommendations to promote broadband investment, increase coverage, and drive utilization include:

- Implement a process for measuring adoption and utilization, not just coverage
- Engage local stakeholders to "own the process" of driving economic development through broadband utilization
- Collect meaningful, actionable broadband data through the proper utilization metrics and indicators to measure current status and track progress towards goals
- Provide case studies that illustrate local examples of broadband impacts

APPENDIX A: INDUSTRY SECTOR FOCUS

The following provide the rationale for focusing on the following industry sectors for the economic impact analysis in this white paper.

Manufacturing represents over 20% of employment in Minnesota outside of the Twin Cities. As a result, the sector has a significant impact on regional economies, contributing to above average wages as well as the opportunity for greater accumulation of wealth in rural economies, relative to other forms of employment in areas outside Minnesota's urban centers. As well, the many smaller manufacturers that contribute to this sector are often characterized by lower broadband utilization rates.

The **Professional and Technical Services** industry tends to be a medium-sized industry in Minnesota, but one that is critical to the state's economy and encompasses leading-edge adopters in most communities and regions. Sector participants provide a key economic resource for communities, with a service that acts as a factor of production for virtually all other industries, and in and of itself tends to drive broadband utilization by other sectors. This sector, with relatively lower start-up costs and a relatively higher dependence on human capital, tends to attract and retain knowledge workers, who typically include younger professionals, forming a part of a pool of skilled human resources necessary to attract and retain larger businesses. By their make-up, these workers, attracted to rural areas of the state, tend to forestall the impact of aging and outmigration that has been the hallmark of rural America for many years.

Finally, **Retail Trade** has consistently been one of the top two or three largest economic sectors in Minnesota in terms of the sheer number of employers and firms outside metropolitan areas. A large percentage of small to medium-sized retail businesses are locally owned. As a result, the locus of decision making is also local, often accompanied by a stakeholder group with a vested interest in the socio-economic welfare of the communities in which they work, conduct business, live, and often retire. These owners and managers are a key segment of the local leadership, participating in bodies such as the Chambers of Commerce and service oriented groups. A large number of these small to medium-sized retailers outside metropolitan areas are shown to have relatively low levels of Internet utilization and, from SNG's recent work, improved utilization among small and medium-sized retail results in measureable and significant benefits for businesses, employees, and their communities.

APPENDIX B: SELECTED COUNTY PROFILES

Profile of Lac qui Parle Economy

Lac qui Parle is located in the southwest of the state and like many rural communities, its population is decreasing, estimated at 7,109 in 2012, about half of what it was in the 1920's. As part of the state's agriculture processing cluster, Lac qui Parle is home to a soybean processor facility owned by the largest cooperative soybean processor in the world, a meat processing and cooking facility, and a major trucking company specializing in the transport of dairy products.

- Unemployment was 3.6% in June 2012
- The number of paid employees is 1,945, working in 191 establishments.
- Average weekly wage is \$558, well below the state average of \$915.

In August 2010, \$9.6 million in ARRA funding was awarded in loans and grants to bring FTTP (Fiber-to-the-Premise) technology to residents and businesses in Lac qui Parle County in west central Minnesota. This FTTP network will make Lac qui Parle one of the leading technology counties in the state. More than 3,700 people stand to benefit, as do roughly 165 businesses and 12 community institutions. Phase Two will be completed by Farmers Mutual Telephone after all of the ARRA funds have been expended and will finish spreading fiber optic technology to the remaining residents and businesses in the county.

Profile of Kanabec County Economy

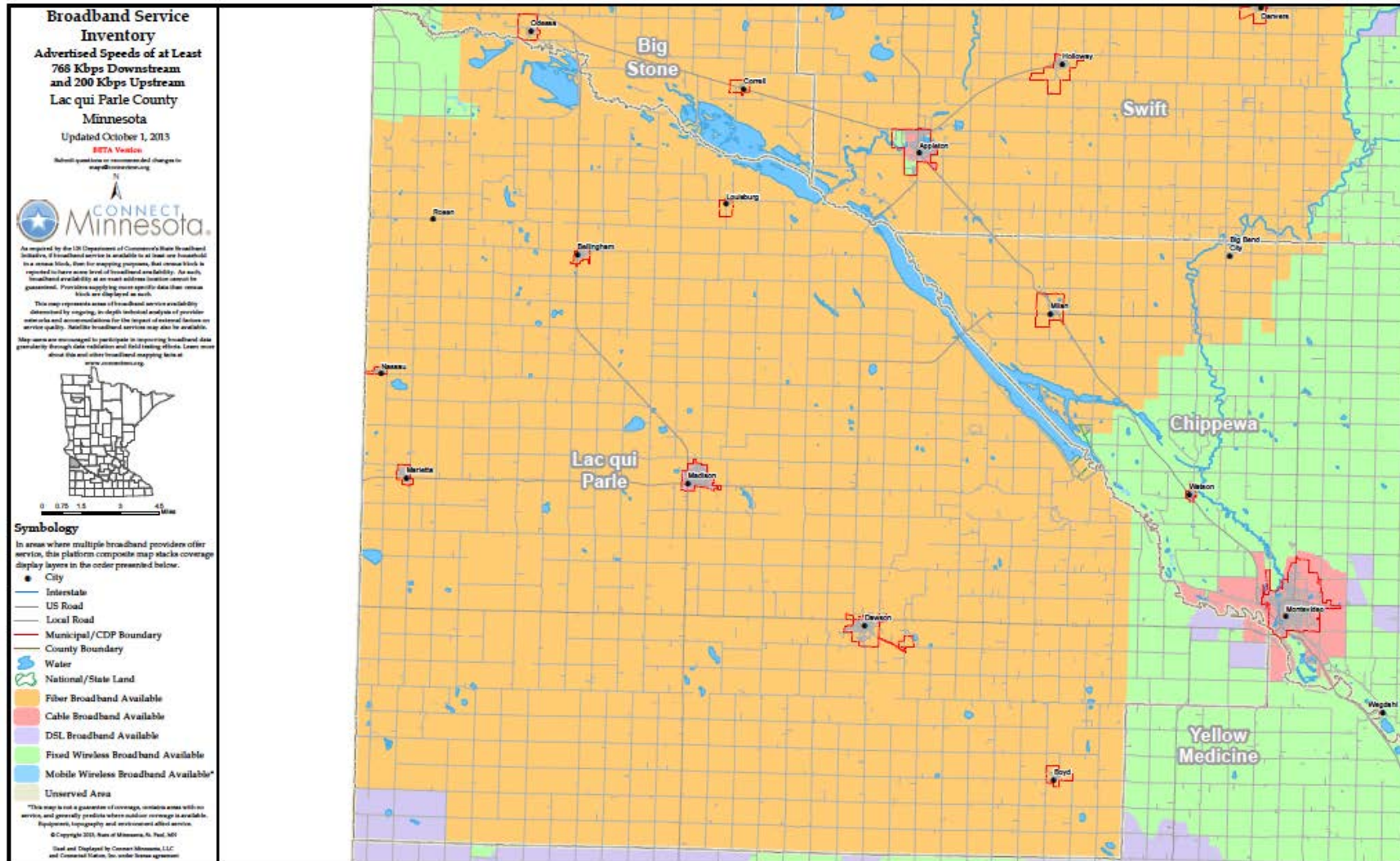
Kanabec is located in the east central area of Minnesota and has boasts an increasing population, estimated in 2012 at 16,005.

- Unemployment rate was 8.6% in June 2012
- The number of paid employees estimated at 3,188, working in 295 establishments.
- Average weekly wage is \$630, well below the state average of \$915.

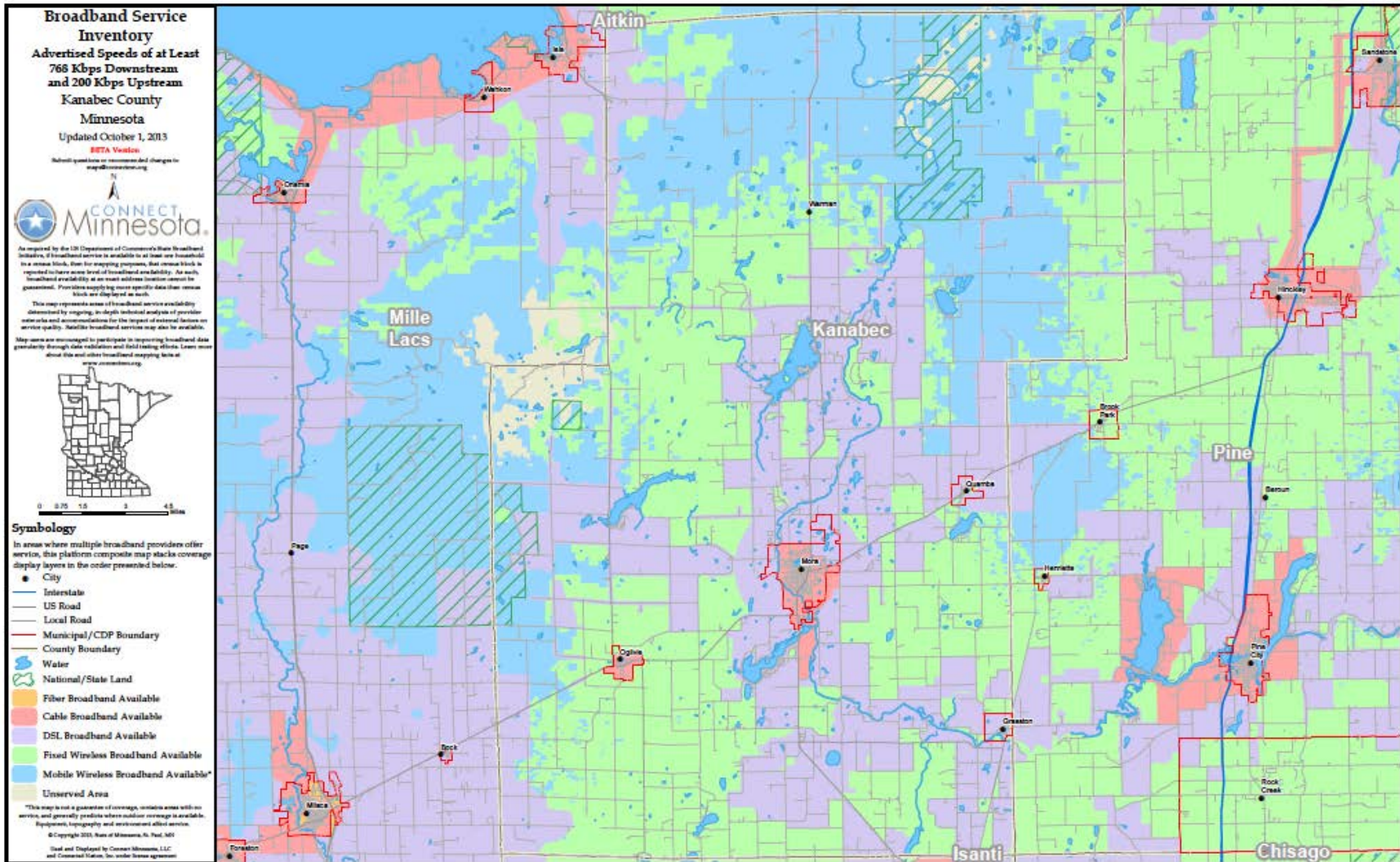
Since 2011, Kanabec County has had its own broadband organization, the Kanabec Broadband Initiative (KBI). Created because of the concerns of local businesses, the organization is an ad hoc group of community stakeholders that recognized the importance of broadband to the economic competitiveness and quality of life of Kanabec County for residents, businesses, and institutions. The goal of KBI is for Kanabec County to meet the statewide broadband goal of 10-20Mbps to every home and business so that they can keep the Kanabec County community competitive with the rest of the state, attracting people and jobs to the area.¹⁷ Kanabec County was one of nine communities in Minnesota to be selected in November 2012 as a Blandin Broadband Community.

¹⁷ More information here: <http://www.kanabecbroadband.org>

Broadband Service Inventory Map - Lac qui Parle County



Broadband Service Inventory Map - Kanabec County

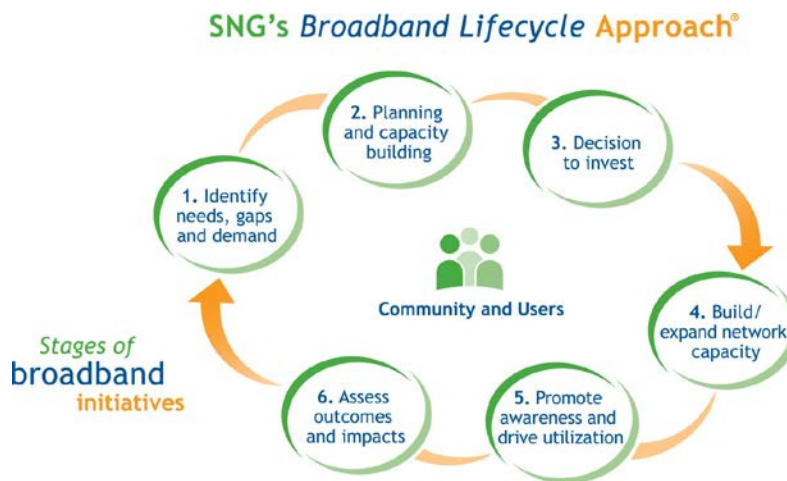


APPENDIX C: SNG - BACKGROUND AND INFORMATION

Strategic Networks Group (SNG) brings global experience and specialization in broadband economics, while working with local stakeholders to build regional knowledge and capacity.

Strategic Networks Group

Strategic Networks Group is a global firm with a team of fifteen in the United States, Canada, Europe and Australia. SNG represents the forefront in planning for the implementation of broadband and accelerating the uptake of Information & Communication Technology (ICT) services for communities and regions globally. The SNG team is distributed across the United States, Canada, and Europe. The SNG team provides flexible capacity to respond to opportunities and client needs, while also providing regional knowledge and specialized expertise. All of SNG staff and associates have ten to thirty years of experience in areas related to SNG's core business – which of course is broadband economics.



SNG has been working with national, regional (State or Province) and local governments on broadband planning since 2001. In addition, SNG has worked for major private sector firms such as Cisco and IBM. Over the last four years, SNG's priority has been delivering services to state governments in the United States as a result of the national broadband initiative.

In addition to its own team of specialists, SNG has developed strategic alliances with other companies that provide clients with complementary consulting services (engineering, GIS mapping, network design and deployment) and regional capacity for on-the-ground activities.

Strategic Networks Group, Inc. is an international firm with primary offices in Ottawa, Ontario, and Denver, Colorado. For this project, SNG's primary point of contact will be Michael Curri, President and CEO of Strategic Networks Group, Inc. He can be reached at the following contact information:

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APPENDIX D: SNG ECONOMIC IMPACT MODELS

SNG’s economic impact model estimates incremental direct impacts from the utilization of new eSolutions for selected industries in terms of incremental revenues and cost savings. The model is set up to investigate the impacts by industry at the 2-digit NAICS level, so that any 2-digit level industry can be selected.

Inputs to the model, including scenario parameters include:

1. Selection of up to 3 industry sector priorities identified by the client at the 2-digit NAICS level.
2. The industry profile for the selected industries in the target region in terms of number of establishments by employment size ranges (based on US Census Bureau County Business Patterns data).
3. Assumptions on the level of business connectivity within the areas of broadband coverage (business broadband subscription rates).
4. Selection of eSolutions under consideration for utilization. There are 17 different eSolutions that can be selected. SNG is able to recommend those that should be included based on greatest opportunity for utilization and impact by each industry in the region of study.
5. Scenarios for increase in utilization of each e-solution for each industry. SNG is able to recommend those that should be pursued.
6. Assumption on the number of eSolutions to be adopted by any given business.

The methodology uses statistics from the SNG dataset to:

1. Determine how many businesses in each industry sector priority identified by the client may adopt the selected new eSolutions.
2. Apply the impact factors derived from SNG research to estimate incremental revenues and cost savings for each eSolution / industry / size combination.
3. Roll up the impacts to estimate the total direct impacts for the target region profile. The aggregate direct impacts could be used as inputs to the Input-Output model for estimating economic impacts.

The key Internet-based applications and processes, or eSolutions that SNG has identified and analyzed across industry sectors are:

eCommerce	eProcess
Selling goods or services	Supplier communication and coordination
Purchasing goods or services	Staff training and skills development
Website for business	Accessing collaborative tools
Advertising and promotion	Teleworking
Delivering services and content online	Social Networking
Customer service and support	Access government information
Rich media or service creation	Government transactions
Research by staff	Banking and financial
	Electronic document transfer



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