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Annual Report and Broadband Plan

December 10

2012

This document contains the Task Force's 2012 Annual Report and Broadband Plan with recommendations for policy makers and stakeholders to consider in the 2013 legislative session.

Governor's Task Force on Broadband

December 10, 2012

Dear Governor Dayton,

Over the last twelve months your Task Force on Broadband has traveled across the state learning about the successes and opportunities in communities due to access to high speed broadband as well as the challenges presented by the lack of access. We have witnessed how broadband can be an incredible equalizer between the more densely populated metropolitan area and Greater Minnesota, enable business growth and provide opportunities for Minnesotans to lead healthier lives.

In Thief River Falls, Digi-Key employs more than 2600 employees. Their business has grown from a small catalog company to one of the largest and fastest growing electronic components distributors in the world. Their business and future growth is reliant on high-speed broadband. Four of every ten searches for electronic components lead to the Digi-Key site.

In Itasca County, high school students are able to take classes that would otherwise not be offered due to low enrollment by utilizing Cisco Virtual Classrooms. These TelePresence classrooms are allowing Itasca County high schools to offer higher level math courses, physics and college in the schools classes, better preparing their students for their future. In addition, the districts are able to offer Ojibwe language classes – an important cultural link for students.

Similarly, several southwestern Minnesota schools are benefitting from a partnership with the MacPhail Center for Music. It allows students hundreds of miles from MacPhail's Minneapolis facility to take classes from MacPhail specialists – augmenting the music education they receive from their onsite teacher and providing additional professional development for teachers.

In southeastern Minnesota, Winona Health providers are treating patients through a telemedicine application that is designed to enable seniors and individuals with disabilities to live independently. The broadband-dependent technology enables health and security monitoring, important reminders (such as medication notices), and e-health provider visits. The program expansion was funded by a federal Health and Human Services Beacon grant received in cooperation with the Mayo Clinic.

All of these examples require high-speed broadband.

While the Task Force is encouraged to report that progress is being made toward the state's broadband goals, **we are not on track to meet them by 2015**. The private sector is continuing to expand service and new technology is improving the quality of the service across the state. But without partnership from the public sector, it will be incredibly challenging to ensure that all Minnesotans have access to high-speed broadband. We believe that the recommendations included in this report will make progress toward achieving these goals.

I would like to thank all of the members of the Task Force for their commitment and dedication to this work over the last year. I look forward to our future work to monitor the state's progress toward achieving border-to-border high-speed broadband.

Sincerely,

Margaret Anderson Kelliher

Margaret Anderson Kelliher
President & CEO of the Minnesota High Tech Association
Chair of the Governor's Task Force on Broadband

I. Introduction and Background

Introduction:

Governor Dayton and policy makers have identified broadband as a critical infrastructure to help grow our state's economy. It can be a catalyst for businesses to grow and expand, students to have access to greater educational opportunities, patients and doctors to connect without leaving their communities, and citizens to engage with their government. While more Minnesotans have access to broadband, those that remain unserved and underserved are increasingly difficult to connect. Governor Dayton and policy makers have identified one of the roles of government is to ensure all Minnesotans have the opportunity to access high-speed broadband.

In 2010, at the recommendation of the first broadband task force, the Minnesota Legislature established in law broadband speed and access goals. The goals are that "as soon as possible, but no later than 2015, all state residents and businesses have access to high-speed broadband that provides minimum download speeds of ten to 20 megabits per second and minimum upload speeds of five to ten megabits per second." And that by 2015 and thereafter Minnesota be in the "top five states of the United States for broadband speed universally accessible to residents and businesses; the top five states for broadband access; and the top 15 when compared to countries globally for broadband penetration."

Since these goals were enacted, the state has made incremental progress toward providing ubiquitous broadband access for all residents. Currently, 81 percent of Minnesotans have access to broadband at 10 Mbps download and 3 Mbps upload. These speeds allow them to use the Internet as a tool to grow jobs, improve educational opportunities and access to health care services.

There is a significant decrease when looking at households who have access to speeds at the state broadband goals. In October 2012, 61.57 percent of Minnesotans have access to broadband at the state mandated speeds leaving approximately 802,000 households that are not connected to broadband services that meet the state's goals. Since Connect Minnesota began collecting this data in April 2011, the number of Minnesota households with access to broadband at the state goal has increased 5.2 percent. While the progress is important, Minnesota needs to do more to meet the 2015 statutory deadline for ubiquitous broadband access.

While the portions of the state that do not have access to broadband are shrinking, the areas that remain have less population density and therefore are more expensive to serve. It is evident that without government involvement, some portions of the state will remain unserved and underserved. If policy makers want to ensure all Minnesotans have equal access to broadband services and the opportunities it provides, it is incumbent on the state to enact policies and incentives to encourage broadband deployment.

Background:

On August 25, 2011, Governor Mark Dayton issued Executive Order 11-27[1] which created the Governor's Task Force on Broadband "to develop, implement and promote state broadband

[1] http://mn.gov/governor/policy/executive-orders/?page=2

policy, planning and initiatives to achieve state broadband needs and goals." The following members currently serve on the Task Force:

Margaret Anderson Kelliher (Chair), President/CEO of the Minnesota High Tech Association
Shirley Walz**,** Sr. Director of Technology for Thomson Reuters
Bernadine Joselyn, Director of Public Policy and Engagement for the Blandin Foundation
Steve Lewsader, President of the Communication Workers of America (CWA), Local 7201
Duane Ring, President of the nine-state Midwest Region of Century Link
Gary Evans, CEO of Hiawatha Broadband Communications (HBC)
Dick Sjoberg, Sjoberg's Cable
Daniel Richter, President of MVTV Wireless
Danna MacKenzie, Director of Information Systems for Cook County
Maureen Ideker, Director of Telehealth, Essentia Health
Matt Grose, Superintendent, Deer River Public Schools
Bob Bass, Bloomington, President, AT&T Minnesota
Bao Vang, President/CEO of the Hmong-American Partnership

Beginning with its first meeting on November 29, 2011, the Task Force has met 14 times in various locations across the Minneapolis/St. Paul metropolitan area (Bloomington, St. Paul, Eagan, Minneapolis) and in outstate Minnesota (Sauk Rapids, Winona, Cass Lake/Deer River, Thief River Falls, and Duluth). And, with the submission of this report, has prepared four reports over the past thirteen months. To organize its work, the Task Force divided itself into subgroups around the areas of: Locations/Meeting Planning; Coordination Across Government Levels; Best Practices/Incentives; State of Broadband—Survey, Research, Data; Broadband Adoption; Monitor/Understand Impact of FCC & PUC Decisions and Cost of Broadband; and Wireless Broadband. (A complete list of subgroups is included in Appendix A.) To inform itself, the Task Force also invited speakers and opened its meetings to members of the public to provide comments. A list of all presenters, by meeting location, is presented in Appendix B.

Previously Submitted Reports:

As required by the Executive Order, the Task Force issued a report on December 29, 2011[2] addressing the areas outlined in the Order:

- The needs, barriers, issues, and goals for broadband access;
- The needs and use of broadband in Minnesota's education systems, health care system, energy sector, industries and businesses, libraries, governmental operations, public safety and other key economic sectors;
- Internet literacy;
- Broadband accessibility for unserved and underserved populations;
- Progress of the federal ARRA broadband projects and mapping in Minnesota; and
- Opportunities to coordinate with federal, state and local agencies.

On January 31, 2012, the Task Force issued a Broadband Plan Outline[3] as required by the Executive Order. That Outline discussed actions the Task Force would take during 2012 to develop a Broadband Plan and guideposts for the generation of an annual report issued by December 10 of each year. The Outline also committed the Task Force to issuing an Information/Status Report by September 14, 2012.

[2] 2011 task force report
[3] Minnesota Broadband Plan Outline

The Task Force, on September 14, 2012, did issue its Status Report and Policy Recommendations.[4] The purpose of that Information/Status Report during the Task Force's first year of operation was to provide for a compilation of baseline information for the Task Force's use in preparing its Broadband Plan and initial annual report. This report also included policy recommendations that represented the consensus of the Task Force and were included in the report to allow the governor, legislators and stakeholders ample time to review and incorporate specific policies in preparation for the 2013 legislative session.

December 2012 Annual Report and Broadband Plan

With the submission of this report, the Task Force intends to meet its commitment of providing a Broadband Plan and first annual report, including the most recent information on the state of broadband in Minnesota, comprehensive analysis of broadband issues and resources, recommendations for how to expand broadband access and adoption, and the plans the Task Force has for its work in 2013.

II. Economic and Civic Argument for Broadband

Multi-generational Volunteering through Video-Conferencing

The Willmar Community Senior Network uses a web-based system called Homestream to allow seniors to live at home longer. Homestream connects seniors to loved ones and their healthcare providers. Often homebound, this technology provides a new way for the community to benefit from seniors. One vibrant "foster grandma" in Willmar recently received the Homestream system; although she enjoyed good health, travel became very difficult in the winter. An active volunteer, one thing she missed was her regular trips to the local elementary school to work with her reading buddy. Once the school heard she had access to broadband, the school quickly connected her reading buddy with her online. Initially, she was a little reticent but soon found that she was still able to enjoy the relationship virtually. Not only did the kids love the added dimension of using technology, her reading buddy benefited from her help and she soon became the most sought after techno-tutor.

(Full story: http://wp.me/p3if7-1rk.)

A Global Impact

Research illustrates that broadband access, adoption and use has significant economic impacts on national economies. A recent article on CNBC highlighted an Organisation for Economic Co-operation and Development/International Telecommunication Union (OECD/ITU) Broadband Commission report that for every ten percent increase in broadband penetration within a country there is a 1.3 percent additional growth in the Gross Domestic Product.[5] There is not a segment of our national and or state economy that is not impacted by broadband and the Internet: retail, education, health care, government, professional and financial services, etc. The national and international research is clear in finding that broadband will continue to have a growing impact throughout all levels of our global economy.

Minnesota's Broadband Economy: A Snapshot

Increased availability and adoption of broadband will play an ever increasing role in Minnesota's economic future. The economic future of communities in Minnesota depends in large part not only upon whether robust broadband infrastructure is present but also upon whether businesses and individuals fully

[4] 2012 Status Report and Policy Recommendations
[5] http://www.cnbc.com/id/48200112/Is_Broadband_Must_Have_Resource_for_Economic_Recovery

utilize that technology to grow and develop local economies. According to a variety of research available, we already see the impact of broadband on Minnesota business. The 2012 Connect Minnesota Business Survey[6] included the following findings related to the economic impact of broadband on Minnesota businesses:

- Approximately 44,000 Minnesota businesses allow their employees to telework, reducing the cost of office space and the number of miles that employees commute for work;
- 73 percent of all Minnesota businesses subscribe to broadband, with approximately 40,000 Minnesota business establishments not using broadband;
- Across Minnesota, businesses that subscribe to broadband report median annual revenues that are $200,000 higher than businesses that do not use broadband. In addition, Minnesota businesses that subscribe to broadband and maintain a website report median annual revenues that are $400,000 higher than businesses that do not use broadband at all.

Minnesota's rural economy is being directly impacted by broadband availability, adoption, and use. The 2012 Minnesota Internet Survey released by the Center for Rural Policy and Development finds that in 2012, 27.4 percent of individuals and/or businesses sold goods or services (or advertised) online; up from 14.3 percent in 2010. In fact, the percentage of rural Minnesota individuals and businesses utilizing broadband for selling/advertising is higher than in the Metro, where 24.3 percent engaged in those activities. Broadband also allows rural Minnesotans the ability to access employment opportunities that previously may have been unavailable in their communities. Through telework (see below), rural Minnesotans can work for organizations not located in their geographical region. Connect Minnesota research indicates that about 16 percent of rural Minnesotans are engaged in some type of telework employment.

Telework Moving Employment in Fergus Falls Forward

Forward Fergus Falls is a coalition of leaders in Fergus Fall that have set out to accomplish "Destiny Drivers" to improve the vitality of the local economy. One of those drivers was to market Fergus Falls as a telecommuting-ready community, which gave rise to the Telework Initiative. This multi-pronged effort strives to: improve broadband access; create a telework hotel to incubate local small businesses and serve as a remote worksite; promote telework to local workers; and market Fergus Fall nationally as a location to find good, reliable teleworkers. Forward Fergus Falls estimates the economic impact of the telework hotel at $400,000 - $450,000 in payroll. The estimate for telework jobs in the area is currently 350 employed by two major Fortune 500 companies and growing.

For more info - http://wp.me/p3if7-1Ez - more updated http://wp.me/p3if7-1Td

The Telework Example

The ability to foster a telework economy is a broadband benefit that has numerous economic impacts. According to Connect Minnesota's 2011 Residential Technology Assessment, 22 percent of Minnesota adults who are employed full-time or part-time say that they work from home, or telework. This means approximately 570,000 Minnesota adults work from home using the Internet instead of commuting to a typical workplace during normal business hours. Each teleworker saves roughly $343.16 a year on average on car maintenance and prevents 1,411 pounds of CO2 emissions entering the atmosphere.[7] Across the state, this equals nearly $196

[6] http://www.connectmn.org/sites/default/files/connected-nation/Minnesota/files/mn_bb_business_final.pdf

[7] Based on 80 work days during the year, 24.2 miles round trip commute, with an average automobile operating costs of 17.74 cents per mile http://www.commutesmart.info/download/AAA_DrivingCosts2011.pdf), and an average automobile efficiency of 26.6 mpg (http://www.futurepundit.com/archives/004903.html) producing 19.4lbs. of CO2 emissions per gallon of fuel consumed (http://www.epa.gov/climatechange/ghgemissions/individual.html).

million saved and 804 million fewer pounds of CO2 emissions each year as a result of teleworking.

Minnesota economic developers are recognizing that telework will be an important component of our work force in the coming years. Fergus Falls has established a telework initiative called Forward Fergus Falls[8] to provide employers and employees with information on telework opportunities. The Minnesota Department of Employment and Economic Development (DEED) has added a location field on its workforce website to enable employers to list jobs as telework positions.

A Consumer and Civic Benefit

Current research illustrates that individuals reap a consumer economic benefit from broadband. According to the Internet Innovation Alliance, an average U.S. household could save over $8,000/year via lower online prices, discounts and coupons.[9] These are savings that could be used in numerous ways to benefit the Minnesota economy.

The presence, or lack thereof, of broadband impacts the civic lives of Minnesotans as well. As noted by Pew[10], broadband has an evolving role in modern political campaigning and how citizens get their political news and information on candidates and issues. Resources such as "E-Democracy" and their "MY Ballot" web site allow individuals to access information on local, state and national elections. More government at all levels in Minnesota is available online, either live or taped; and the National Broadband Plan specifies Civic Engagement as being a priority use of enhanced broadband service across the country. The Task Force recognizes the role broadband does and will play in Minnesota's civic life and will continue to focus on these issues in future work.

Similarly, in a recent U.S. Chamber of Commerce study on the impact of broadband on education[11], it was stated that the technologies enabled by broadband can redefine the traditional notions of education but are dependent on the wide availability,

Telehealth: Connecting Health Care and Patients across the State

The Minnesota Telehealth Network is part of Essentia Health, Minnesota's largest provider of rural health services. Essentia spans from Duluth into Northwestern Wisconsin and across Northern Minnesota to Fargo and into North Dakota. The Minnesota Telehealth Network was established in late 2011 and in just 15 months the network has grown to include 21 Essentia Health hospitals and clinics and 45 specialty providers. These services reach out to patients via state-of-the-art videoconferencing technology, high speed broadband connections and a secure Virtual Private Network. Four hospital based programs are in place: emergency medicine, hospitalist, toxicology and stroke care. Eight clinic based programs are offered: cardiology, dermatology, psychiatry, nephrology, medical weight loss management, dietician services, medication therapy management and wound care.

The program development has been implemented in areas where there is a high level of specialist interest but a scarcity of available services. Telehealth increases access to specialty care for rural populations. It also stretches limited provider resources and allows for more patient contact time and attention. The patient and family satisfaction is excellent. Essentia plans to continue to expand telehealth services by adding new programs and sites across Minnesota, North Dakota and Wisconsin.

[8] http://www.fergusfallstelework.com/
[9] http://www.internetinnovation.org/blog/entry/cost-savings-2012/
[10] http://www.pewinternet.org/topics/Politics.aspx?typeFilter=5
[11] http://www.uschamber.com/issues/technology/broadband-publications

robust adoption, and willingness and ability of educators to incorporate the technologies in and out of the classroom. These impacts on education occur in both the K-12 and higher education environments; and a recent report by Connect Minnesota highlights how Minnesotans are taking advantage of online learning.[12]

Travel Time Eliminated & Travel Cost Reduced

Winona-based, Psychiatric Services for Home and Community Options clients have very specialized therapy needs with the closest qualified resource located in Faribault, MN, approximately two hours away. Historically, counseling sessions were conducted in person, requiring either the psychiatrist travel to Winona or by transporting clients to the psychiatrist. As transportation costs have risen, new solutions in telemedicine have been explored with success. To address the current reimbursement rules that require clients located in Winona to connect with the Faribault psychiatrist at WinonaHealth rather than in their home environment, a waiver is being sought for the evaluation of this alternative and innovative method of care. The projected cost savings by allowing home-based counseling and eliminating transportation by utilizing the new Winona telemedicine network is estimated at almost $6,000 a year. It is expected that the program will expand to other clients and providers as a model in patient care, time efficiency, and money saving tool.

The Task Force, also, heard about the impact broadband has on consumer health care choices. Previous 2012 Task Force reports presented initial examples and perspectives on the impact broadband is having on health care; and in future work the Task Force will more closely examine how broadband will continue to change how health care is consumed and provided.

What is clear is that broadband is changing the way Minnesotans act as consumers and as citizens. The Task Force realizes these are weighty topics that deserve additional study. As work plans for 2013 and beyond are put in place, the Task Force will ensure its focus will include examining how Minnesotans and the state's economic and civic life are impacted by the continued expansion of broadband.

III. The State of Broadband in Minnesota – Where Are We Now?

Progress toward State Speed Goals

State broadband goals were established during the 2010 legislative session and are found in Chapter 237.012 of Minnesota Statutes. The goals include the following:

> *Universal access and high speed deployment as soon as possible, but no later than 2015 all state residents and businesses have access to broadband service that provides a minimum download speed of ten to twenty megabits per second and minimum upload speed of five to ten megabits per second.*

[12] http://www.connectmn.org/sites/default/files/connected-nation/Minnesota/files/mn_elearning.pdf

State broadband leadership position. It is a goal of the state that by 2015 and thereafter, the state be in:

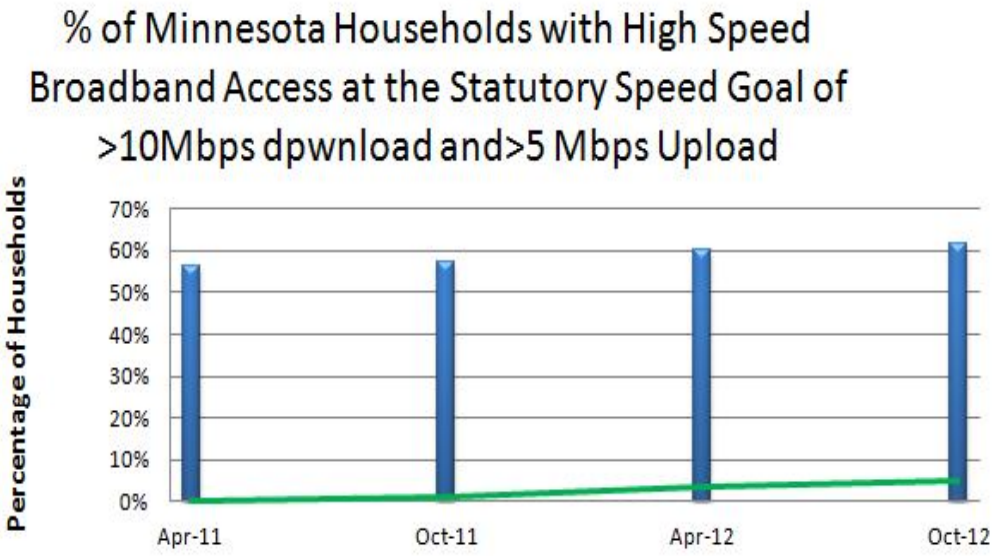
(1) The top five states of the United States for broadband speed universally accessible to residents and businesses;

(2) The top five states for broadband access; and

(3) The top 15 when compared to countries globally for broadband penetration.

Connect Minnesota, as part of its work in the state, reports on availability data and, beginning in 2011, included broadband speed availability at the state statutory speed goals.

October 2012 Connect Minnesota data show that 61.57 percent of Minnesota households can access broadband at speeds of at least 10 Mbps download/6 Mbps upload – the minimum speed threshold for Minnesota's goal of ubiquitous broadband availability at the statutory speed goal. The October 2012 data show an increase of nearly two percent since April 2012; and an overall increase of over five percent since analysis of availability at the state speed goals was begun in April 2011. The chart below represents the trend over the past 18 months:



	Apr-11	Oct-11	Apr-12	Oct-12
Percent of Households	56.40%	57.40%	59.90%	61.60%
Percentage of Growth	0.00%	1.00%	3.50%	5.20%

Figure 1: Percent of Minnesota Households Meeting Statutory Speed Goals (Source: Connect Minnesota)

The following Connect Minnesota October 2012 maps provide a view of: 1) statewide availability at the statutory speed goals, indicating underserved areas, and; 2) a county-level view of availability at the statutory speed goals.

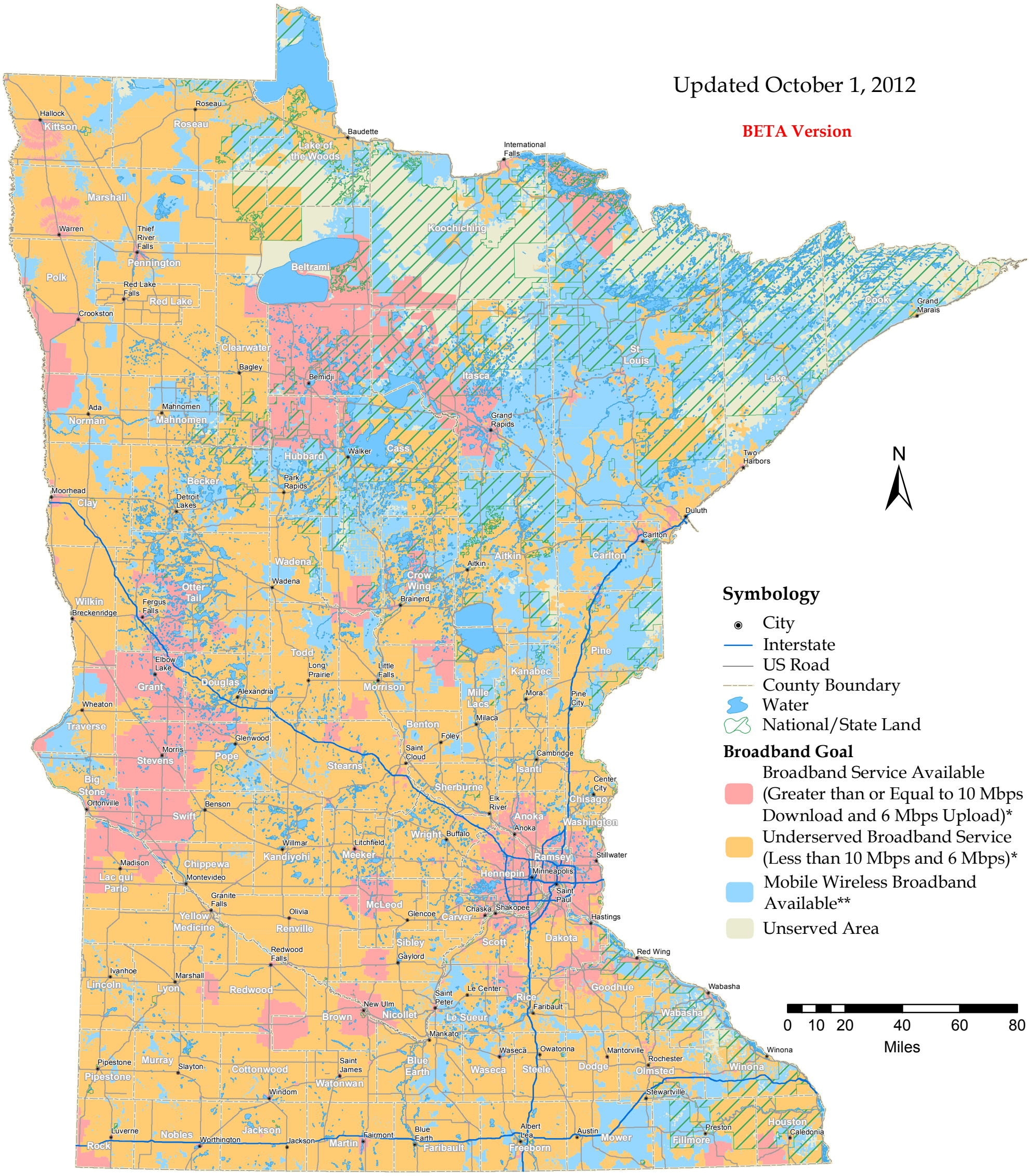
Broadband Service Inventory for the State of Minnesota

Advertised Speeds of at Least 10 Mbps Downstream and 6 Mbps Upstream

Submit questions or recommended changes to: maps@connectmn.org

Updated October 1, 2012

BETA Version



Symbology

- City
- Interstate
- US Road
- County Boundary
- Water
- National/State Land

Broadband Goal

- Broadband Service Available (Greater than or Equal to 10 Mbps Download and 6 Mbps Upload)*
- Underserved Broadband Service (Less than 10 Mbps and 6 Mbps)*
- Mobile Wireless Broadband Available**
- Unserved Area

As required by the US Department of Commerce's State Broadband Initiative, if broadband service is available to at least one household in a census block, then for mapping purposes, that census block is reported to have some level of broadband availability. As such, broadband availability at an exact address location cannot be guaranteed. Providers supplying more specific data than census block are displayed as such.

* MN Statute 237.012 indicates upload goal of 5 Mbps. Data collection only conforms with speed tiers as represented in the SBI NOFA where 6 Mbps is the most comparable.

Map users are encouraged to participate in improving broadband data granularity through data validation and field testing efforts. Learn more about this and other broadband mapping facts at www.connectmn.org.

This map represents areas of broadband service availability determined by ongoing, in-depth technical analysis of provider networks and accommodations for the impact of external factors on service quality. Satellite broadband services may also be available.

**This map is not a guarantee of coverage, contains areas with no service, and generally predicts where outdoor coverage is available. Equipment, topography and environment affect service. Wireless service does not meet MN Statute 237.012 goals.

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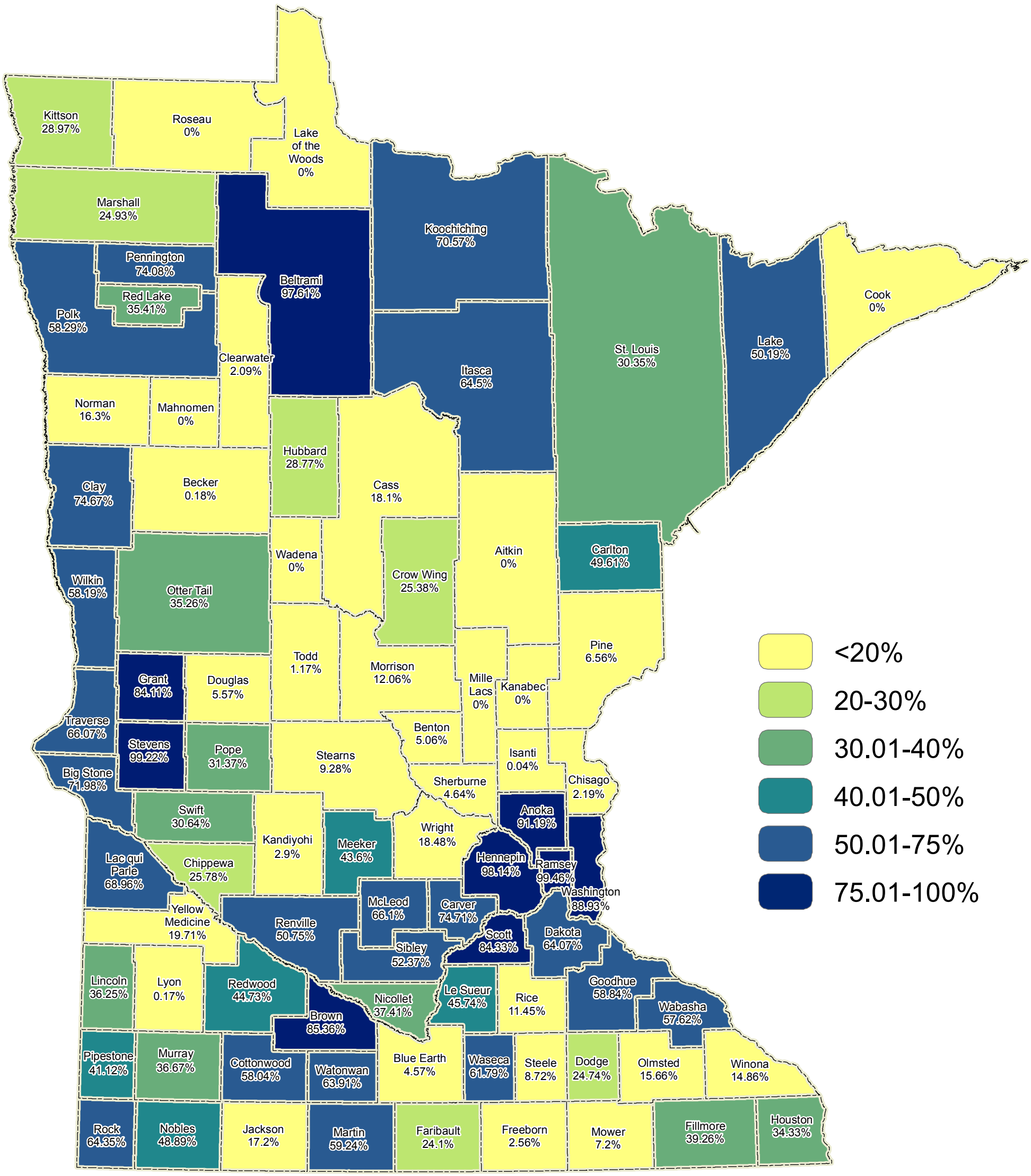
Broadband Availability in the State of Minnesota
Percentage of Households Served by Terrestrial, Non-Mobile Broadband Service

At Least 10 Mbps Download/6 Mbps Upload Speeds
Statewide Availability: 61.57%



Additional Broadband Availability Data

In addition to measuring broadband availability at the statutory speed goal, the latest availability data show the following key findings[13]:

- 86.81 percent of Minnesota households can access fixed broadband at advertised speeds of 6 Mbps download/1.5 Mbps upload, meaning that 275,000 households are in areas that may be eligible for Connect America Fund Phase II broadband deployment subsidies;
- 81.97 percent of Minnesota households can access broadband at speeds of at least 10 Mbps download/3 Mbps upload, indicating that upload speeds are significantly reducing the availability percentage toward the minimum speed threshold for Minnesota's goal of ubiquitous broadband availability (excludes mobile and satellite services);
- Broadband at the 4 Mbps/1Mbps speed defined by the Federal Communications Commission in the National Broadband Plan is available to 97.44 percent of Minnesota households (includes mobile and satellite services).

The full data set, including complete county-level availability analysis is available on the Connect Minnesota web site: www.connectmn.org

With regard to the state broadband leadership position for broadband speed, Minnesota's standing has generally been measured using Akamai's *State of the Internet* report which is issued quarterly. The most recent report available is from second quarter 2012. With regard to the goal that Minnesota be in the top five states for broadband speed universally accessible to residents and businesses, Minnesota's average connection speed was 6.7 Mbps (up from 6.0 Mbps in first quarter 2012), placing the state in 25th place amongst the states. For the second quarter of 2011, Minnesota ranked 24th with an average connection speed of 5.7 Mbps. Thus while the average connection speed has increased, that increase is not at a rate greater than other states which would enable Minnesota to move up in the rankings.

Top Ten States 2Q2012 in Average Broadband Connection Speed

Rank	State	2Q 2012 Avg. Mbps
1	Delaware	12.1
2	New Hampshire	10.1
3	District of Columbia	9.7
4	Vermont	9.7
5	Rhode Island	9.0
6	Massachusetts	8.8
7	Connecticut	8.7
8	Virginia	8.3
9	Washington	8.3
10	Utah	8.1
…		
25	Minnesota	6.7

Figure 2: States with Highest Average Broadband Speed (Source: Akamai)

[13] Broadband at the basic 768 kbps download/200 kbps upload tier is available to 99.92% of Minnesota households but the Task Force believes that service at this level is inadequate.

Similarly, for the state broadband leadership position for broadband access, measured according to data available on the National Broadband Map for speeds of 3 Mbps download and 768 kbps upload and as of December 2011, Minnesota's ranking actually slipped to 38th from 28th a year earlier.[14] In 2013, the Task Force will identify states that have made advancements and the factors contributing to that increase in ranking for both of these measures.

With regard to the third state broadband leadership goal of the state being in the top 15 when compared to countries globally for broadband penetration (penetration defined as household adoption rate), the Task Force has not yet identified a valid resource for measuring where Minnesota ranks internationally. The Task Force believes this is an important goal even if finding a viable measurement is difficult.

The Task Force would note that based on the Center for Rural Policy and Development, data shows that the statewide rate of adoption grew by 5.9% between 2010 and 2012:

Year	Adoption Rate
2012	75.4% of households
2010	69.5% of households

Figure 3: Minnesota's Adoption Rate 2010-2012 (Source: Center for Rural Policy and Development)

Video-Chat Capabilities Connect Grandparents and Grandkids

A grandmother in Benton County recently purchased a new computer to take advantage of telehealth options. This new health system uses sensors to monitor her behavior, prescriptions, and movement; it also provides videoconferencing options to speak with her healthcare staff from home. In addition to the health benefits the computer, videoconferencing equipment and broadband provide, the grandmother in Benton County is now able to see her granddaughter in Hawaii via video-chat. Able to participate in family milestones, like meeting her great-granddaughter for the first time by using her computer, broadband is helping this grandma stay in good health and good spirits.

(Full story: http://wp.me/p3if7-1Ow.)

[14] Based on information from Connect Minnesota, the fall in ranking is attributable, at least in part, by a directive from the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce (which oversees the state broadband mapping efforts). The NTIA directive was for broadband mapping entities to standardize the recording of the Verizon Communication Inc.'s wireless broadband data at a lower speed tier than the 3 Mbps down/768 kbps upload that it had previously been recorded in Minnesota. Verizon had been the lone provider of broadband service at this speed tier to several thousand customers in Minnesota and the effect was thus reflected in Minnesota's ranking compared to other states which were not as significantly impacted.

The figure below shows adoption rates of computers, Internet service, and broadband in the Twin Cities metro area and the rest of Minnesota since 2001

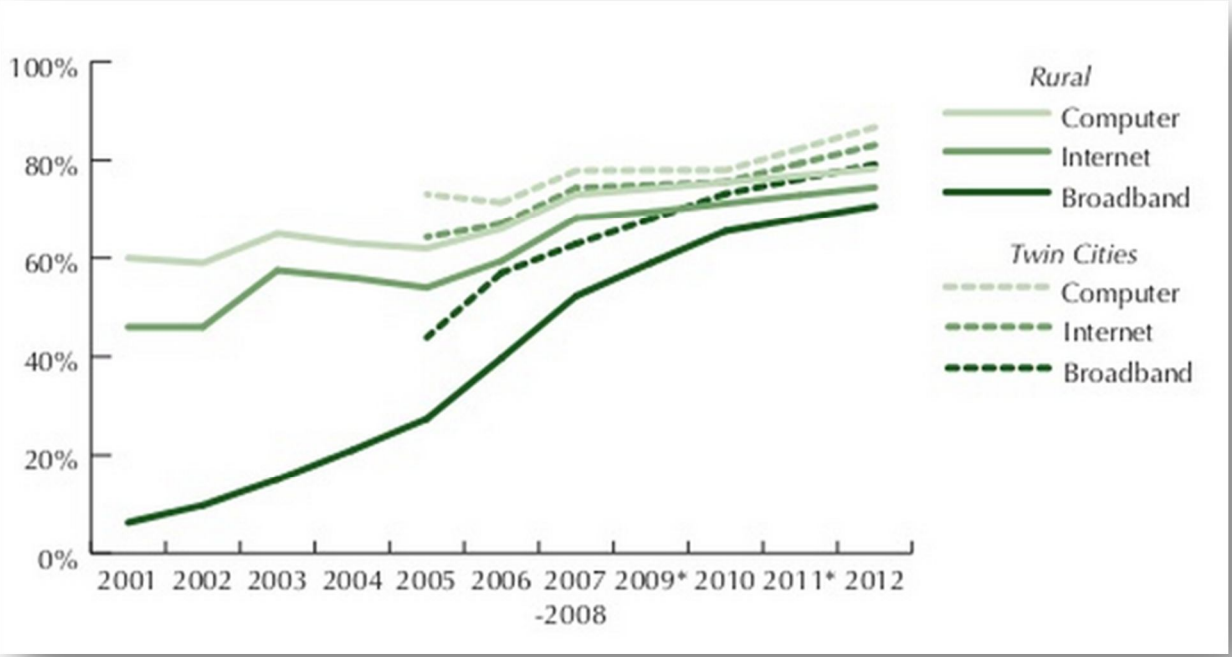


Figure 4: Computer, Internet and Broadband Adoption: Rural v. Metro (Source: Center for Rural Policy and Development)

The OECD has also compared the United States adoption rate to other countries by fixed (wired) broadband subscriptions and by terrestrial mobile broadband subscriptions. This table is shown as an indication of where the United States compares to other nations as Minnesota specific data is not available nor does the OECD data exactly measure what the statutory goal requires.

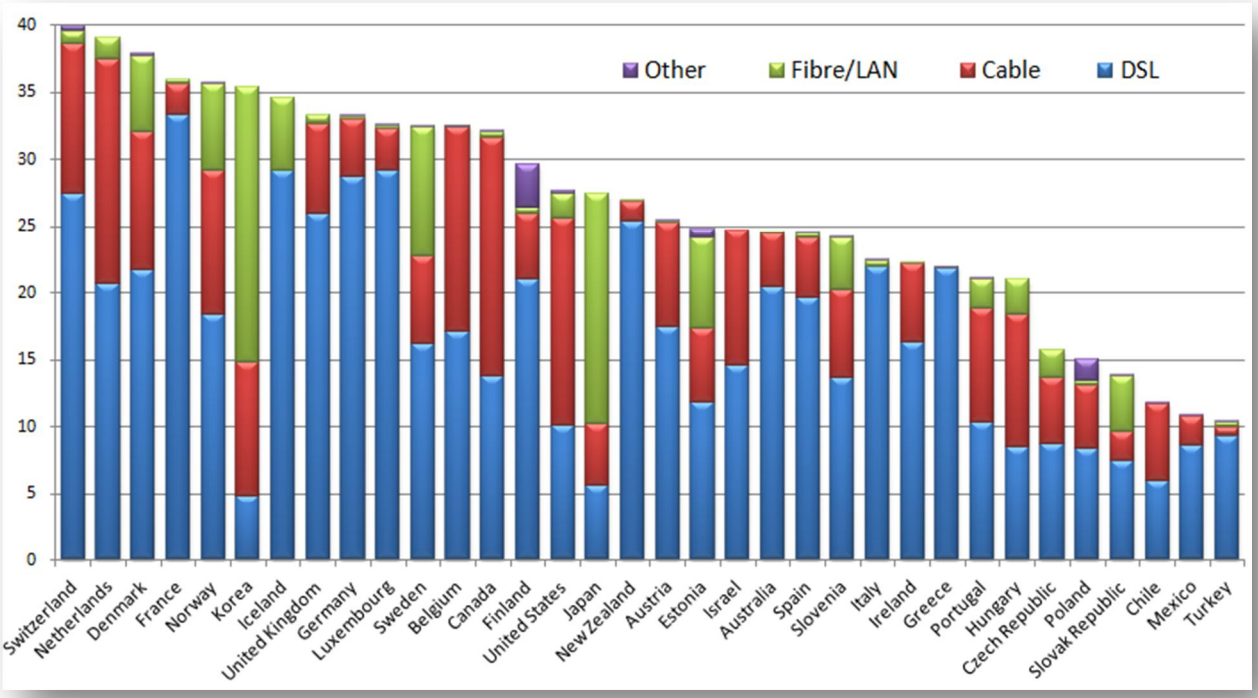


Figure 5: Fixed (wired) broadband subscriptions per 100 inhabitants, by technology (Source: OECD, December 2011)

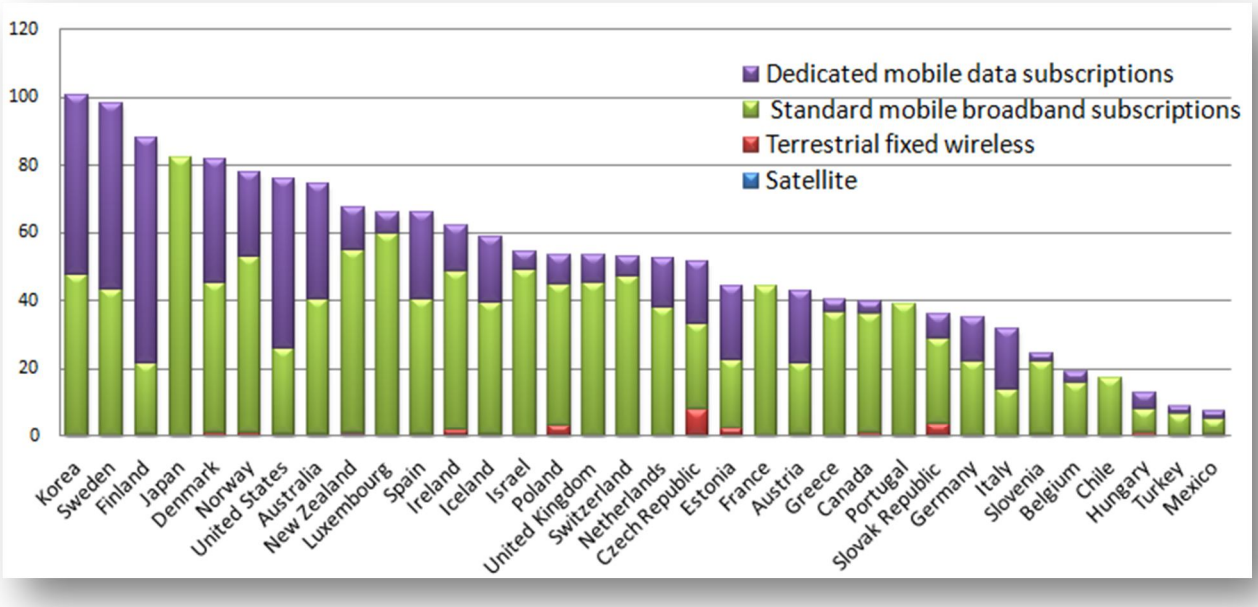


Figure 6: Wireless broadband subscriptions per 100 inhabitants, by technology (Source: OECD, December 2011)

Survey Research: Adoption and Use

A number of research surveys were released over the past 12 months that focused on how Minnesota residents and business adopt and use broadband. The data illustrate that there are still significant adoption gaps among Minnesota demographic groups and geographic locations (rural v. urban). Additionally, however, trends are illustrating a move among some populations to rely on wireless and/or mobile broadband rather than a home connection. The Task Force will continue to monitor research trends to be able to best make future recommendations that will move Minnesota forward toward achieving the state broadband goals.

According to the 2011 Connect Minnesota Residential Survey, the data show that 28 percent of Minnesota households do not subscribe to broadband. The major reasons cited by non-subscribers were:

- No content worth viewing (29 percent)
- Broadband fees expensive (18 percent)
- Not available (8 percent)

The survey results show significant broadband adoption "gaps" exist among ethnic, low-income, rural and senior households. The most recent data on these groups show the following rates of non-adoption:

- 53 percent of low-income households
- 51 percent of Hispanic households
- 39 percent of rural households
- 68 percent of seniors
- 79 percent of low-income seniors
- 54 percent of low-income households with children

(Note: The 2012 Connect Minnesota Residential Survey is currently being completed but will not be finished before the Task Force submission of its December Report. The 2012 Residential Survey Data will be included in a future report and made available to the Task Force as soon as the results are compiled and reviewed.)

The Center for Rural Policy and Development released their "2012 Minnesota Internet Survey: Digital Divide 2.0 and Beyond" and their results included the following highlights:

- 70.6 percent of rural households reported purchasing broadband in 2012 compared to 79.2 percent of Twin Cities households
- 12.2 percent of rural non-adopters cite "Don't Need Internet Access" as their primary reason for not subscribing to broadband service
- 73.8 percent of rural broadband subscribers primarily used a home computer to access the Internet; followed by 12.3 percent using a tablet and 9.6 percent using a cell phone

The City of Minneapolis IT Department conducted a community technology survey[15] that showed 82 percent of city households have computers with Internet access and 63 percent believe Internet access is essential. The survey also illustrated that Minneapolis residents connect to the Internet in a variety of ways:

- 44 percent cable
- 22 percent wi-fi
- 19 percent cellular
- 19 percent DSL
- 10 percent other

Eleven percent of Minneapolis residents responded that they do not have Internet access at home. The survey indicated that among non-users of broadband, 46 percent were Caucasian, while 54 percent were African American, Hispanic or other ethnicity.

Dr. Jack Geller of the University of Minnesota Crookston presented at the September 2012 Task Force meeting[16] and shared a number of important data points with the attendees:

- The Pew Internet and American Life Project (April 2012) reported nationwide home broadband adoption of 62 percent; however when looked at demographically the breakdown was:
    - Caucasian – 66 percent
    - African-American – 49 percent
    - Hispanic – 51 percent

- However, the same Pew Report showed mobile broadband adoption via smart phone had the following characteristics:
    - Caucasian – 45 percent
    - African-American – 49 percent
    - Hispanic – 49 percent

- The largest barriers to increased broadband adoption in rural Minnesota according to Dr. Geller will likely include price and data capping employed by wireless providers

The Task Force also looked at how wireless broadband technology might impact adoption rates across the state. The emergence of wireless technologies and mobile devices provide new ways for people to connect and they provide connectivity options for those people with either no wireline connectivity and/or no access to desktop and/or laptop computers. Many people purchase multiple ways of connecting. They buy both wireline and wireless services. They have multiple devices in their homes and places of business, some fixed, some mobile, including desktops, laptops, tablets, smart phones, televisions, gaming and other entertainment devices.

With multiple options, consumers select the device and connectivity that is most suitable for the task – the television for group entertainment viewing; a computer for work and/or homework; a tablet for personal entertainment, social networking and/or web surfing; with a smart phone for maximum portability and voice communications. They may be connecting through a wired or fixed wireless connection, a home or remote wi-fi network, satellite or a cellular service.

[15] http://www.minneapolismn.gov/it/inclusion/WCMS1P-092357

[16] http://www.connectmn.org/sites/default/files/connected-nation/Minnesota/files/broadband_task_force_presentation_9-11-12.pdf

Forced to choose, lower-income citizens may select only cellular wireless plans and cellular/wi-fi devices. Some consumers that only subscribe to, or only have the option of a wireless device, may be limited as to what they can accomplish due either to bandwidth constraints that currently exist under some providers' service offerings -- such as cellular or wi-fi availability, cellular service bandwidth caps or pricing mechanisms – and/or the limitations of the device – screen size, application limitations or compatibility, and keyboarding/navigation limitations. The Task Force heard and saw examples of the effective and creative uses of wireless technologies in Minnesota and how these technologies may contribute to achieving the state's broadband goals. However, some argue that bandwidth caps and pricing per gigabit may inhibit even greater adoption and use of these technologies by citizens and businesses The Task Force is aware that the federal government is working to manage and make available additional wireless spectrum for broadband use that could address some of these concerns. In September 2012, the FCC unanimously approved proposals to reclaim spectrum currently used for television to then re-auction for expansion of wireless broadband networks. The Task Force will continue to monitor this and other federal spectrum activities for the impact on wireless broadband availability, adoption, and use in Minnesota.

Transformation of Cook County Mobile Oriented Tourism Sites

Tourism accounts for 70% of the local economy in Cook County, MN. More than 1,000,000 visitors travel to Cook County each year. The county invested in five websites to attract visitors to the area – but in the last few years county officials noticed a change in how people were accessing the websites. In 2009, only 9 percent used mobile phones to access the sites; but by 2011, that number had grown to 27 percent. Cook County recently converted its tourism sites to a mobile-friendly format, which required a change to a web development platform that was mobile-compatible. Now potential Cook County visitors can plan their vacations on a wider variety of screen sizes. Since the conversion, they noticed 700 iPad visitors in just one weekend!

(Full story: http://wp.me/p3if7-1Ot.)

Making Use of Data: Planning for the Future

The Task Force is recommending a number of policy initiatives designed to move Minnesota forward toward achieving our state broadband speed goals and addressing adoption challenges. In order for progress to be made, it is imperative that policy makers and stakeholders utilize the available research and mapping data as implementation decisions are made. These data provide us with details about adoption and utilization rates and trends, underserved and unserved areas across the state, and projected impacts of current and future broadband projects. The state specific data come from a myriad of sources: Connect Minnesota, the Minnesota Department of Commerce, broadband providers, the University of Minnesota and the Center for Rural Policy and Development, and nonprofit stakeholders who work in communities across the state on broadband issues. As the Task Force continues its work, we will rely on data to inform our activities and future recommendations.

One area of focus for future research and analysis will include measurements of broadband satisfaction. Connect Minnesota is expected to release data on residential broadband satisfaction at the end of 2012. The Task Force will, also, work to identify other survey opportunities (such as the work of Dr. Jack Geller of the University of Minnesota Crookston) that could include satisfaction measurements and other key data points.

It is also important to the Task Force and policy makers to understand how and why broadband speed matters by looking at applications and what technical requirements are necessary to use

those applications. The following chart provides an overview of a wide range of broadband-enabled activities and applications and the relative speed requirements of each:

Upload & Download Speed Range	Applications	Uses in Minnesota
500 Kbps – 1 Mbps	Voice over IP Basic Email Web Browsing (simple sites) Streaming music (caching) Low Quality Video (highly compressed)	▪ Email ▪ Basic Internet use ▪ NetMotion clients for general mobile laptop use ▪ Satellite Connections at Command Vehicle ▪ Winona personal health record retrieval
1 – 5 Mbps	Web Browsing (complex sites) Email (larger size attachments) Remote Surveillance IPTV-Standard Definition (1-3 channels) File Sharing (small/medium) Telecommuting (ordinary) Digital broadcast video (1 channel) Streaming Music	▪ Cisco VPN for remote connections ▪ Home based medical and dental transcription ▪ Skype High Definition video calls ▪ Netflix high-quality video
5 – 10 Mbps	Telecommuting (converged services) File Sharing (large) IPTV-SD (multiple channels) Switched Digital Video Video on Demand Standard Definition Broadcast Standard Definition Video Video Streaming (2-3 channels) HD Video Downloading Low-Definition Telepresence Gaming Medical File Sharing (basic) Remote Diagnosis (basic) Remote Education Building Control and Management	▪ MacPhail Center for Music teaching via Telepresence ▪ Independent Lifestyles – computer training lab ▪ MN Library Information Network (MnLINK) ▪ Home-based customer service delivery (telecommuting converged services) ▪ Basic online medical visit (Low-Definition Telepresence)

10 – 100 Mbps	Telemedicine Educational Services Broadcast Video SD and some HD IPTV-HD Gaming (complex) Telecommuting (high-quality video) High-Quality Telepresence HD Surveillance Smart/Intelligent Building Control	▪ Deer River High School - Ojibwa Language Class via Telepresence ▪ Anoka-Hennepin – Investing class via TelePresence ▪ Winona Telemedicine Network 100 Mbps Service Capacity (Note: the list implies simultaneous use) ▪ Three channels of HDTV (18-20 MB/channel, uncompressed) or (2-4 MB/channel, compressed) ▪ Voice telephone (multiple lines) ▪ Radio, music, video downloads ▪ Web surfing ▪ Outgoing data – business servers, video streaming, videoconferencing
100 Mbps – 1 Gbps	High Definition Telemedicine Multiple Educational Services Broadcast Video Full High Definition Full IPTV Channel Support e.Government (small counties) Video on Demand High Definition Gaming (immersion) Remote Server Services for Telecommuting	▪ All local application on city network ▪ LOGIS fiber connections to the State ▪ Clay County network connection

Figure 7: Broadband Speed Ranges for Common Applications with Minnesota Examples

Infrastructure Projects: Status Updates and Overview

There is continuous investment in infrastructure projects across the state, including American Recovery and Reinvestment Act (ARRA) projects and private and public projects. The impact of these projects is important to quantify and the Task Force will focus not only on the status of such projects but also on how these projects impact progress towards the state's broadband goals. Following is information on the ARRA projects in Minnesota and select additional infrastructure projects.

Updated ARRA project table

The Task Force's initial report in December 2011 provided an update on the status of all of the ARRA broadband projects impacting Minnesota. The Task Force believed it would be worthwhile to continue tracking the progress of those projects and has therefore included an update of that table in Appendix C.

Other broadband initiatives and infrastructure projects

As GigaOM reports,[17] in the United States, providers are investing in broadband in the amount of $249 per person annually compared to a worldwide investment rate of $155 per person annually by OECD countries. Likewise, in addition to the ARRA funded projects described in Appendix C, there are other activities occurring in Minnesota related to broadband access, adoption and use that are designed to make progress towards the broadband goals. A few examples are provided below:

Project Ignite—Red Wing, MN: U.S. Ignite, a new non-profit public-private partnership convened to help bring together network providers, software developers, and Internet users to create next-generation broadband applications was launched on June 14, 2012. The partnership includes 25 cities around the country, as well as research universities, and key companies such as Verizon, Comcast, Juniper Networks, and Cisco. The U.S. initiative is committed to developing over the next five years 60 applications that will operate on gigabit-enabled networks. The applications are focused in six areas of national priority: education and workforce, energy, health, public safety, transportation and advanced manufacturing.

Hiawatha Broadband Communications (HBC), based in Winona, was included as one of the initial 11 service providers named as Ignite partners. HBC, the smallest firm included, was honored with membership because of its pioneering history of broadband development in rural America. Red Wing is among the 25 Ignite partner cities and HBC is building a gigabit network there. Red Wing has formed a Red Wing Ignite not-for-profit organization that in early 2013 plans to create an applications incubator, as well as hosting a national conference. More about U S Ignite can be found at www.us-ignite.org . Red Wing is currently developing its Ignite web presence that soon will be found at www.RedWingIgnite.org.

Cloquet Valley Internet Initiative: Seven townships in St. Louis County, north of Duluth, MN and with limited broadband availability, have formed a joint powers agreement to investigate options available for gaining or improving Internet access in the area. A feasibility study was conducted to identify and analyze all possible options regarding broadband providers. An engineering study was conducted to examine the engineering and business infrastructure as well as the cost of fiber to the home for the region. The project has a website for more information: http://www.pequaywanlakes.com/internet/index.htm

Kanabec Broadband Initiative (KBI): In Kanabec County, approximately 75 percent of the populations

Online Diabetes Training Program Heralded as Success

Winona's effective and cost saving telemedicine network program began with diabetes training. For seniors who no longer drive but need ongoing care, like the elderly couple in Lewiston, MN who require education and support to manage their diabetes, attending doctor's appointments can be difficult. Luckily, their daughter was able to take time off of work in Rochester to provide transportation to their doctor's appointments. Unfortunately, rural clinics like Lewiston run into staffing difficulties which results in closing needed locations. The telemedicine network structure was the contributing factor in reopening the clinic in Lewiston – needing only one nurse practitioner on staff to provide services. Today, the Lewiston Clinic doors are open and patients, like our elderly couple, are able to walk to the clinic to utilize the telemedicine network for needed support to manage their diabetes.

[17] http://gigaom.com/2012/11/23/the-state-of-broadband-in-the-u-s-infographic/

lives outside of the two primary towns in the county (Mora and Oglivie) and are without a competitive broadband option. About 40 percent of the county has either no broadband or service at less than 3 Mbps download. A feasibility study was completed and recently released. The Initiative will have to determine how to move forward. Complete information is available on the KBI website at: http://www.kanabecbroadband.org/

Blandin Foundation: The Blandin Foundation has been involved with broadband initiatives, especially in the area of broadband adoption, since 2003. Blandin is completing work on its ARRA funded Minnesota Intelligent Rural Communities (MIRC) project. In November 2012, the Foundation announced the selection of nine new communities as part of its Blandin Broadband Communities Program for intensive, two-year partnerships funded by Blandin for work on local broadband initiatives. Those communities selected include: Fond du Lac Band of Chippewa, Itasca Economic Development Corporation, Kanabec County, Lake County, Southwest Minnesota Broadband Services, Lake of the Woods County Economic Development Agency, Lac qui Parle Valley School District, Mille Lacs County and Mille Lacs Band of Ojibwe.

R-S Fiber Project: In Sibley and Renville counties, work has been underway for approximately two years to address the broadband needs of residents in the area. At the time this report was published, the joint powers board overseeing the project was planning to begin construction in the spring of 2013.

IV. Achieving The Goals: Advancing Access and Adoption

Governmental Approaches

Local Government

County survey

In an effort to gauge the activity related to broadband, whether for access, adoption or use (such as in economic development activities), the Task Force, under the purview of the Coordination Across Government and State of Broadband—Survey, Research and Data subgroups, sent a survey to each of Minnesota's 87 counties. To date, responses have been received from 62 counties for a 71 percent return rate. In reviewing the responses, it is difficult to draw any conclusions or identify any trends. The responses received so far suggest there is a wide range of engagement levels by county officials and staff, from zero to fully involved. Additional work will be done in 2013 to seek more responses and further develop the picture of how counties are engaging in broadband issues.

State Government

Minnesota state government has a multi-year history of focusing on broadband. From establishing statutory broadband goals to the creation of task forces, Minnesota governors, state legislators, and agencies have made broadband issues a priority. Governor Mark Dayton established the current Task Force in 2011 and over the past year we have engaged with state policy makers in numerous ways, including:

- Testimony given to a Minnesota State Senate Committee to update members on Task Force activity and the state of broadband in Minnesota;
- Testimony given to the state Public Utilities Commission to provide an overview of Task Force activity and address their broadband questions; and,
- Issuance of four reports, including this December 2012 report that includes specific policy recommendations (see below) for state policy makers and stakeholders.

In addition, the state works in partnership with Connect Minnesota on broadband mapping and research to ensure policy makers and stakeholders have the most accurate data available to inform decision making.

Policy recommendations

The Task Force, in its September report, made a number of policy recommendations designed to advance the state's progress toward the statutory speed goals and enhance broadband adoption and digital literacy. The Task Force was asked by the Department of Commerce and Governor's Office to provide additional rationale for each recommendation. The recommendations are included as the last section of this Report.

Federal Government

FirstNet

The Middle Class Tax Relief and Job Creation Act of 2012[18] created the First Responder Network Authority (FirstNet) to ensure the establishment of a nationwide, interoperable public safety broadband network. The Act directed the FCC to reallocate and grant a license to FirstNet for use of the 700MHz D block and existing public safety broadband spectrum for an initial ten year term. The Act also provides $7 billion in funding to deploy the national network and $135 million for a State and Local Implementation Grant Program administered by NTIA to support state, regional, tribal and local jurisdictions' efforts to plan and work with FirstNet to ensure the network meets their wireless public safety communications needs. The FirstNet board operates as an independent entity within the National Telecommunications and Information Administration (NTIA) within the U.S. Department of Commerce. The Board was appointed in August 2012. In November, the FCC officially granted the spectrum license to FirstNet.

At the state level, the creation of FirstNet and the national public safety broadband network provides an opportunity for continued planning, the possibility of funding to assist in planning efforts, and the option to participate in the national network deployment or to deploy a state network that would be interoperable with the national network. Each state must also designate a liaison to FirstNet; in Minnesota, Governor Dayton has designated the Commissioner of the Department of Public Safety as the liaison.

In the longer term, as plans for the public safety broadband network are more concrete, there may be opportunities to coordinate infrastructure placement and use, and possibly even spectrum, towards assisting Minnesota to meet its broadband speed goals. The Task Force believes that FirstNet may provide a unique opportunity to ensure other vital community institutions can access high speed broadband service. Thus, those entities (Community Anchor Institutions such as libraries, schools, healthcare facilities, local government, etc.) should be engaged in the discussions surrounding the planning for Minnesota's first responder broadband network. In addition, the Task Force believes that FirstNet provides a unique opportunity for the Department of Public Safety to coordinate with other state agencies such as MN IT, DEED and the Department of Commerce. Given the planning period that will occur prior to any construction, it is unlikely that the public safety broadband network will have an impact by 2015, the year established for meeting the state's broadband speed goals.

[18] http://www.gpo.gov/fdsys/pkg/PLAW-112publ96/pdf/PLAW-112publ96.pdf

FCC

As discussed in the Task Force's September 14, 2012 report, there is ongoing activity at the Federal Communications Commission (FCC) as that regulatory body transitions the federal Universal Service Fund (USF) to a Connect America Fund (CAF) to support broadband deployment. Below is a recap and update.

CAF Phase I: In Phase I of the transition to CAF, the FCC had made $300 million available to price cap carriers to build out broadband at a minimum of 4Mbps/down and 1 Mbps/upload to new locations and be reimbursed $775 per new location served. CenturyLink was the only price cap carrier that accepted Phase I funding in Minnesota and intends to receive $10,956,175 to bring broadband to 14,137 new locations. CenturyLink did request a waiver of the program requirements that, if granted, would have them serve an additional 10,174 locations. Waiver requests were also filed by some of the other price cap carriers although those requests had no impact on Minnesota. Of the $300 million made available, only $115 million was accepted by price cap carriers, leaving $185 million unclaimed. The FCC has not ruled yet on any of the waiver requests. On November 19, 2012, the FCC released a Further Notice of Proposed Rulemaking (FNPRM) in WC Docket No. 10-90 seeking comments on how to allocate the remaining $185 million in the 2012 Connect America Phase I fund.

Phase I Mobility Auction: The FCC also held the Phase I Mobility Auction on September 27, 2012. No wireless carrier put in a bid for Phase I mobility funding to serve any portion of Minnesota.

CAF Phase II: Since the September 14, 2012 report of the Task Force, there has been no additional information to report on the parameters for CAF Phase II. The details for all components of CAF Phase II (price cap carrier, rate of return carrier, wireless) continue to be under development.

Contribution Reform: It should also be noted that the FCC is working to reform how the contributions into the USF/CAF are made. Under the current mechanism, telecommunications companies must pay a percentage of their interstate end-user revenues to the Universal Service Fund. This percentage is called the contribution factor. The contribution factor changes four times a year (quarterly) and is increased or decreased depending on the needs of the Universal Service programs.

Addressing Access, Adoption and Use: Non-governmental Approaches

The Task Force, throughout 2012, heard about a number of non-governmental approaches to addressing broadband access, adoption and use; and we believe these should be further explored in 2013 in order to best leverage them as the state moves toward achieving ubiquitous broadband and closing the "digital divide".

With over 120 broadband providers in Minnesota, the Task Force recognizes the private sector will play the leading role in expanding broadband access and increasing speed by investing in next generation technologies. As the Task Force recommends in this report, the state can leverage the pace of private sector technology enhancement by creating incentives and policy recommendations to spur this private sector investment. In addition, as is being explored in Minnesota (and in other states), public-private broadband projects can be developed to ensure the latest and fastest broadband technology is part of any project plan.

All provider types are making technological advances that are improving broadband availability and speed across Minnesota. The Task Force has worked with an "all-of-the-above" approach with respect to technologies that can help the state meet its broadband goals; and is technology

neutral and focused on those technologies that can deliver the required data speeds and increase adoption. One area that had not received much review in the past was wireless broadband. The Task Force, recognizing that there are still areas in the state that are unserved or underserved by broadband, focused attention on how various technological advances in wireless technology might impact Minnesota's progress toward the state broadband goals. The Task Force established a Wireless Subgroup to specifically research and report on how wireless broadband impacts Minnesota. Wireless providers have been deploying next generation services across the state for the past couple of years and technological advances are delivering data speeds that are comparable to wired broadband networks.

In addition, significant investment has been announced by several major wireless providers that will improve data speeds, deployment and provide Minnesota consumers with additional options that meet state speed goals. The following chart illustrates the evolution of wireless broadband speeds available:

Standard	Download	Upload
2G	114 Kbps	60 Kbps
3G	3.6 Mbps	250 Kbps
4G	7.2 Mbps	1 Mbps
4G LTE	15 Mbps	10 Mbps

Figure 8: Wireless Broadband Speeds by Technology (Source: CTIA, Mobile Future and Root Metrics Data Performance Reports)

Along with the progression of wireless broadband technology the Task Force also looked at Smartphone and mobile device usage in the United States. The chart below depicts the growth in Smartphone and application usage from 2011 to 2012.

Figure 9: Smartphone, Android & iOS Statistics (Source: Nielsen)

In addition, the chart below shows the amount of time spent on various mobile phone functions.

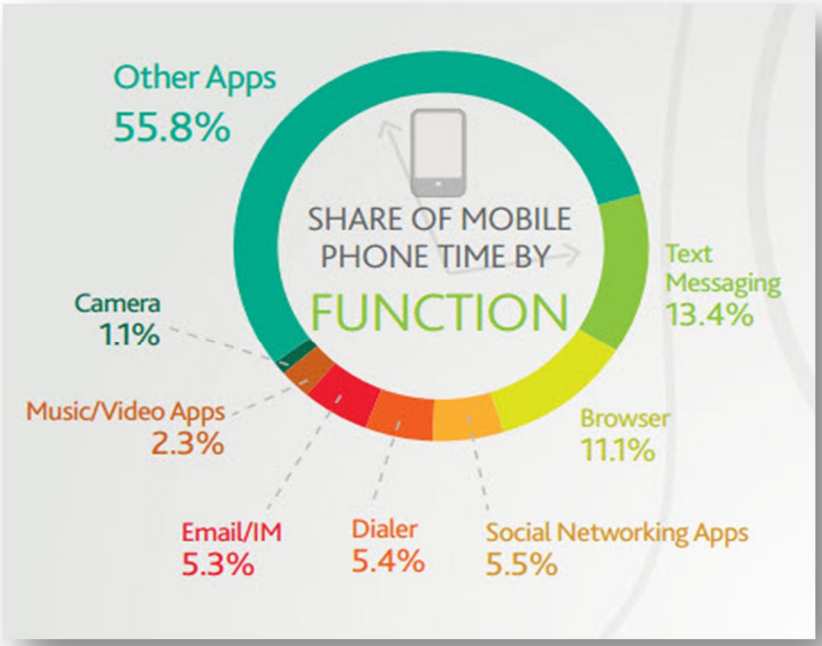


Figure 10: Share of mobile phone time by function (Source: Nielsen "State of the Media" 2011)

Private sector providers and nonprofits are also working to address broadband adoption and "digital divide" issues in Minnesota. These programs, which we have highlighted in previous reports, include both discounted and free computer programs; discounted broadband service made available by both Minnesota broadband providers and nonprofit organizations; digital literacy training programs available both online and at physical locations across the state; and, community engagement programs that work with local public/private/nonprofit

Leech Lake Band of Ojibwe Digital Literacy Training Program

The Leech Lake Band of Ojibwe added a Computer Digital Literacy Training component to their Temporary Employment Program (TEP). Tribal staff have been trained to teach specific Office applications and Temporary Employment Program student workers help learners with the digital literacy component in the computer labs. The value of attaining digital literacy skills has been built into the pay structure of TEP. The incentive motivates students but also provides a hands-on approach to high tech training, which is paying off. Many of the 400 program graduates are getting jobs. One young woman that participated in the program has used her computer skills to pursue her GED. Another benefit of this program: the training has no age barriers - the oldest trainee was 72 years old!

stakeholder to address broadband and digital literacy issues in a targeted community. Additional details about these programs can be found in Appendix D.

The Task Force, through the work of the Adoption Subgroup, focused on the following Broadband Adoption efforts:

1. County Internet, phone, and cable directory.

Based on the Minnesota Intelligent Rural Communities initiative, Benton County created and distributed an Internet, phone and cable directory in its community. The Task Force thought it would be useful to duplicate the effort in other rural counties that they visited. Brochures exist for Benton, Itasca, and Nobles County. An example can be found in Appendix E.

2. Broadband Awareness site - http://whybroadband.org/

WhyBroadband.org is a central location for Minnesota residents and communities who want to make better use of broadband tools (see screenshot below). The site presents ways for people to get a computer, receive training, and connect with others using various online resources.

3. Links to Connect Minnesota Interactive Map

The Task Force has been promoting and working with various resources around the state to ensure they are aware of the Interactive Map that is available on the ConnectMN.org site. A few counties have included references on their county page to the Interactive Map.

The Task Force recognizes that Minnesota must rely on our private and nonprofit sectors to truly address our access and adoption issues. Public-private partnerships will

play a role; as will incentivizing private sector behavior as we do with many other industries in Minnesota (and as is being done via federal policy for broadband deployment across the country). As we approach 2013, the Task Force will continue to explore how private and non-profit entities are working across Minnesota on broadband issues and how the best practices discovered might be utilized to ensure Minnesota achieves our broadband goals in the most efficient and effective manners possible.

Task Force Plan for 2013

The Task Force plans to meet throughout 2013. As in 2012, meetings will be held both in the Metro Area and in targeted locations in Greater Minnesota. Locations for monthly 2013 meetings were not set at the time of writing this Report, however the Locations Subgroup has advised that four of the Task Force's monthly meetings during the year be held in non-Metro locations. As soon as locations are identified, they will be posted to the Minnesota Department of Commerce and Connect Minnesota web sites.

The Task Force focused much of its work in 2012 on securing the needed information for writing the three reports presented to the governor this year. Turning to 2013, the Task Force believes there is an opportunity to focus on targeted broadband issues related to access, adoption and use. In addition, there will be more opportunities to devote a significant amount of meeting time to focus on such issues. While the Task Force is charged with producing an end-of-year report in 2013, there are no other official deliverables scheduled. However, the Task Force may decide during the course of the year to issue "White Papers" or commentary on issues when key findings from meetings would be important for policy makers and broadband stakeholders to be aware of in relation to addressing Minnesota's broadband landscape.

Morris School Speech Therapist uses Video – Improving Efficiency and Effectiveness

Eileen Bliss is a Chokio-Alberta speech language clinician. She works two days a week, previously at one location, but now uses the new VidyoTherapy and broadband to "teleport" into the schools one day a week. VidyoTherpay sets up cameras at each location for students and teachers to interact. Young students have mastered the system quickly, and adults have caught on as well. In fact, the system has improved efficiency for staff, provided flexibility for students, and is building a sustainable method for reaching people in rural areas. A shortage of speech clinicians is predicted, so having a system in place is important to help students in Stevens County receive the services they need.

V. 2012 Policy Recommendations

Proposal: Provide a tax credit or grant to incent broadband providers to build in unserved areas. Coordinate with Connect Minnesota to provide target areas that are underserved or unserved and provide priority for projects that will serve these target areas

Example: Several states have proposed programs similar to this proposal. Examples include the Mississippi broadband technology tax credit,[19] the Idaho matching grant program[20] and the Wisconsin sales tax exemption and income tax credit[21]. The Task Force suggests the Wisconsin model as a preferred option.

Estimated Costs: The Department of Revenue is working to price this proposal.

Outcomes: The Task Force's goal in establishing such an incentive would be to allow private providers to offset a portion of build-out costs to make build-out and service provision in unserved areas more cost effective. By utilizing data and mapping resources, the state could ensure that the incentive was focused in regions currently underserved or unserved by high speed broadband. If successful, this incentive will help the state move towards achieving its statutory broadband goals.

Metrics: Successful implementation of this proposal could be measured by tracking claimants of the incentive and mapping claimants' build-out projects in underserved or unserved areas, thereby advancing Minnesota towards achieving its statutory broadband goals.

Proposal: Extend current sales tax exemption on equipment purchased for use in a central office to include the purchase of fiber optics and broadband equipment

Example: Currently, machinery and equipment used directly by a telecommunications, cable television or direct satellite service providers is exempt from sales and use tax in Minnesota. This proposal would expand the exemption to include fiber equipment necessary to deploy higher bandwidth speeds that meet the state broadband goals.

Estimated Costs: $4.97 Million in FY14-15, $5.81 Million in FY16-17, based on draft estimates from the Department of Revenue.

Outcomes: Based on testimony from Task Force members, the savings captured by eligible providers thanks to this tax incentive would allow for increased investment in equipment that will deploy high speed broadband to underserved or unserved areas of Minnesota. **The Task Force estimates that every dollar of public investment would correspond to $12 of private investment by eligible companies.**

Metrics: Successful implementation of this proposal could be measured by tracking the number of additional households served by companies that claim the credit.

[19] http://www.mississippi.org/mda-library-resources/finance-tax-info/tax-exemptions-incentives-and-credits/broadband-technology-tax-credit.html
[20] www.legislature.idaho.gov/idstat/Title63/T63CH30SECT63-3029I.htm
[21] http://docs.legis.wisconsin.gov/2005/related/lcactmemo/sb483.pdf

Proposal: Create a program or mechanism to coordinate rural broadband installation with state and federal programs assisting hospitals, schools, libraries, and public safety facilities with obtaining broadband

Example: The Task Force heard from a number of stakeholders throughout the year that there are a number of federal programs designed to ensure that specific community resources (including hospitals, schools, libraries and public safety facilities) have access to high speed broadband service. The Task Force concludes that there should be a resource within state government, such as the Office of Broadband Development, to serve as a clearinghouse for this information.

Estimated Costs: The Task Force recommends the state seek federal funds to accomplish this goal.

Outcomes: The Task Force believes that implementation of this proposal would ensure that Minnesota is well positioned to take advantage of federally-funded opportunities to incent broadband investment (particularly in rural areas) and leverage these opportunities with future state investment to maximize impacts. This proposal could also serve as an outreach tool for the state in order to proactively encourage project development and to speed completion of on-going projects.

Metrics: Successful implementation of this proposal could be measured by tracking the level of federally-funded investment in broadband installation projects in Minnesota and by tracking outreach contacts with Minnesota businesses and consumers.

Proposal: Implement a formal "Dig Once" process to coordinate highway construction and broadband deployment projects

Example: This year, Arizona enacted the "Digital Arizona Highways Act of 2012[22]" which allows the state to install broadband conduits in conjunction with rural highway construction projects. The Task Force recommends that Minnesota establish a similar formal process to both allow the state to install conduit and provide an opportunity for broadband providers to install conduit, fiber, etc. when road construction projects are already scheduled to maximize opportunities for broadband providers and state, county and local transportation departments to collaborate.

Estimated Costs: .5 FTE.

Outcomes: The Task Force believes this proposal will reduce costs related to a lack of coordination and communication regarding rights-of-way, roadway and broadband infrastructure between transportation agencies and broadband providers. This would reduce costly multiple openings of infrastructure corridors, minimize inconvenience for travelers and citizens while reducing infrastructure project length. In addition, the Task Force believes it will spur engagement between state government and private providers. Ultimately, the Task Force believes enacting this proposal will help advance Minnesota towards achieving its statutory broadband goals.

Metrics: Successful implementation of this proposal could be measured by tracking the number of broadband installation projects that are undertaken in conjunction with road construction projects in Minnesota.

[22] http://www.azleg.gov/DocumentsForBill.asp?Bill_Number=SB1402&Session_ID=107

Proposal: Develop a Minnesota Fiber Collaboration Database

Example: This proposal is modeled after the California Fiber Collaboration Database[23], which allows broadband providers to view upcoming construction projects, notify the state transportation department of their interest in including broadband infrastructure in a project and provides opportunities for collaboration among companies interested in joint trenching opportunities.

Estimated Costs: .5 FTE.

Outcomes: The Task Force believes that Minnesota could achieve outcomes similar to California's, where the database is used by broadband providers to collaborate on projects and share construction costs when they wish to build in the same area.

Metrics: Successful implementation of this proposal could be measured by tracking utilization of a Minnesota database, the number of projects undertaken thanks to collaborations built through the database process and the number of projects built out into underserved or unserved areas of Minnesota.

Proposal: Award scholarship dollars for broadband access for students, especially those that meet federal poverty guidelines

Example: Currently, both CenturyLink and Comcast offer discounted monthly broadband subscriptions for $9.95 for families eligible for Lifeline[24] or for students eligible for free or reduced school lunch. These programs are targeted towards low-income subscribers in order to minimize the cost barrier to Internet access.

Estimated Cost: $840,000 for FY14-15. Based on the CenturyLink and Comcast examples, the Task Force estimates that the monthly subsidy per scholarship awarded would likely average $35 per month, or $420 annually. The Task Force projected the cost of providing 1000 scholarships at $420 per year to arrive at a $420,000 annual cost.

Outcomes: Several providers are currently offering discounted broadband access to provide Internet to families who cannot afford service at home. By awarding scholarships to offset this cost, the Task Force believes the number of students who have access to broadband service would be increased and the digital divide would be reduced.

Metrics: Successful implementation of this proposal could be measured by the number of scholarships awarded and the number of overall households impacted.

[23] http://www.dot.ca.gov/broadband/

[24] Lifeline is an FCC program that provides discounted phone service for low-income households.

Proposal: Increase funding to public libraries and schools for computer stations and Internet access

Example: Currently, some Minnesota residents do not have adequate access to computers or high speed broadband due to economic, demographic or geographic factors. Like other states, a digital divide has developed in Minnesota. This proposal would seek to increase primary public access points, such as public libraries or public school facilities, for "digitally-disadvantaged" Minnesotans and reward institutions that increase hours and access to their facilities.

Estimated Cost: $4 million for FY14-15. Based on discussions with the Blandin Foundation and the superintendent of the Deer River School District (which has considered expanded computer center hours), the Task Force estimates a cost of $37.50 per hour to keep an existing computer lab open. For an extra 10 hours per week at 100 public access locations, the cost would be $1.95 million. In addition, the Task Force estimates $100,000 to provide new computers to these public access locations.

Outcomes: The Task Force views this as a short-term tool that can help increase the number of Minnesota residents who can, at a significantly reduced cost, access broadband service that meets the state's statutory goal. The anticipated impact of additional resources would allow these public facilities to expand the number of public computer stations, increase hours of operations and develop or enhance training programs. Priority could be given within the funding structure to libraries and schools in locations that are currently underserved or unserved by high speed broadband.

Metrics: Successful implementation of this proposal could be measured by the number of additional computer stations available to the public, number of patrons utilizing computer stations and the number of communities in Minnesota that have public facilities with broadband access that meet the state's statutory broadband goals.

Proposal: Establishment of an ongoing, post-Task Force resource within state government for high speed broadband-focused efforts in the future.

Example: The Task Force feels it is important to establish an ongoing entity to carry on the work of monitoring whether the state is making progress in achieving its broadband goals and making recommendations to policy makers in order for the state to meet those goals. The entity should include elected, citizen and multiple state agency participants and be accountable to the Governor and Legislature. The Task Force recommends looking to the Legislative-Citizen Commission on Minnesota Resources and the Legislative Energy Commission as two possible structures.

Estimated Costs: 1 FTE, per diem, mileage, etc

Outcomes: The Task Force views this ongoing entity as a consistent resource within state government to provide the necessary expertise to policy makers to make progress toward achieving the broadband goals.

Metrics: A successful entity will provide annual updates on the state's status toward reaching its broadband goals. In addition it will provide feedback on whether any incentives in law are improving broadband access and will make recommendations about additional incentives or policies in order for the state to meet its broadband goals.

Appendix A

1. Locations subgroup
   Bernadine Joselyn (Leader)
   Maureen Ideker — Danna MacKenzie
   Margaret Anderson Kelliher — Bob Bass

2. Coordination Across Government Levels subgroup
   Danna MacKenzie (Leader)
   Matt Grose
   Duane Ring
   Steve Lewsader

3. Best Practices/Incentives subgroup
   Dick Sjoberg (Leader)
   Margaret Anderson Kelliher — Dan Richter
   Duane Ring — Gary Evans
   Maureen Ideker — Shirley Walz

4. State of Broadband—Survey, Research, Data subgroup
   Matt Grose (Leader)
   Bao Vang
   Margaret Anderson Kelliher

5. Broadband Adoption subgroup
   Shirley Walz (Leader)
   Maureen Ideker — Bernadine Joselyn
   Dan Richter — Steve Lewsader

6. Monitor/Understand Impact of FCC & PUC Decisions; Cost of Broadband subgroup
   Gary Evans (Leader)
   Bao Vang — Bob Bass
   Danna MacKenzie — Dick Sjoberg

7. Mobile Broadband subgroup
   Bob Bass (Leader) — Gary Evans
   Bernadine Joselyn — Dan Richter
   Shirley Walz — Dick Sjoberg

Appendix B

Governor's Task Force on Broadband—List of Testifiers in 2012

January 10, 2012
Dennis Fazio, TIES (host facility)
Ann Higgins, League of Minnesota Cities

January 24, 2012
David Frenkel
Heather Rand, DEED

February 14, 2012
Mary Hartnett, Executive Director, Commission for Deaf, DeafBlind and Hard of Hearing Minnesotans
Jay Wyant, Chief Information Accessibility Officer, Minnesota Office of Enterprise Technology

March 27, 2012
Cara Ruff, Executive Director, Independent Lifestyles (host facility)
Tom Ardolf, Cybermation
Darrin Strosahl, Superintendent of Foley Public Schools
Jamie Carlson, Suntan Supply
Nancy Hoffman, Economic Development Director, Benton County
Karl Samp
Jim McDermott, Director of Emergency Management, Benton County
Brad Harrison, Netgain Technology
Jim Martinson, Minnesota Intelligent Rural Communities member for Benton County
LeRoy Wedl

April 17, 2012
Dan Browning, Unisys (host facility)
Bill Coleman, Dakota Future Intelligent Community Initiative
Anita Scott, Director of IT, Dakota County
Tom Garrison, Communications Director, City of Eagan
Gordon "Butch" McConnell, Dakota County
Russ Matthys, City Engineer, City of Eagan
Paul Zyla, AgStar

May 8, 2012
Mike Allen, Winona Health (host facility)
Lacey Hart, Mayo Beacon Project
John Goodman, A-Vu Media
Maureen Ideker, Essentia Health

June 12, 2012
John Fuller, Counsel, Minnesota Senate
Joel Michael, Research Department, Minnesota House of Representatives
Bob Eleff, Research Department, Minnesota House of Representatives
Otto Doll, CIO, City of Minneapolis
Erika Nelson, Office of Sen. Klobuchar
John Schultz, U-reka Broadband
Dan Gasow, CenturyLink
Toby Brummer, Hiawatha Broadband
Dave Seykora, Minnesota Department of Transportation
Gary Shelton, Scott County

July 16, 2012
Carri Jones, Tribal Chair, Leech Lake Band of Ojibwe
Mike Jones, MIRC Coordinator
Janice Gale, Director, Temporary Employment Program, Leech Lake Band of Ojibwe
Rep. Tom Anzelc, Minnesota House of Representatives
Rep. John Persell, Minnesota House of Representatives
Rep. Carolyn McElfatrick, Minnesota House of Representatives
Brad Box, Deer River School District, Board of Education Chair
Fred Underwood, IT Director, Fond du Lac Band of Lake Superior Chippewa
Frank Reese, MIS Manager, Leech Lake Band of Ojibwe
Jennifer Dugan, Minnesota Department of Education
Fred Nolan, Director, Minnesota Rural Education Association
Joe Silko, Itasca Area Schools Collaborative
Curt Tryggestad, Eden Prairie School District Superintendent
Mark Adams, Greenway and Nashwauk/Keewatin

September 11, 2012
Scott Crittenden, Dean of the Thief River Falls campus of Northland Community and Technical College (host facility)
Michelle Landsverk, Impact 20/20
Jack Geller, University of Minnesota at Crookston
Tony Harris, Digi-Key

October 16, 2012
Commissioner Mike Rothman, Minnesota Department of Commerce
Kyle Carpenter, President and CEO of MacPhail Center for Music (host facility)
Paul Babcock, COO, MacPhail Center for Music
Andy Elofson, PCs for People
Casey Sorensen, PCs for People
Brandon Abley, Minnesota Department of Public Safety

November 13, 2012
Marc Johnson, Kanabec Broadband Initiative
Janet Keogh, Cloquet Valley Internet Initiative
Jake Dahl, Application Developer, resident of Biwabik, MN
Ann Higgins, League of Minnesota Cities
Roger Skraba, Mayor of Ely, MN
Diane Smith, Mobile Future

Appendix C

Progress of the Federal ARRA Broadband Projects and Mapping in Minnesota
American Recovery and Reinvestment Act (ARRA) funding for broadband awarded in 2009 and 2010 for projects impacting Minnesota totaled more than $238 million. That figure does not include at least $25 million of private or in-kind contributions to complete these projects. Several multi-state grants affecting Minnesota were also awarded. The table below provides a summary of the progress in implementing these projects.

Grantee	Amount	Description	2012 Update
Infrastructure Projects:			
Arvig Telephone Company/TDS	$5,048,168	Bring high speed DSL service to unserved establishments within its rural service territory in Crow Wing County, MN.	MP Nexlevel out of Maple Lake, MN has been hired to do the outside construction work. Fourteen sites will have fiber to the node and existing copper to the customer premises. Five sites will be copper to the node and existing copper to the premises. Fiber to the customer premises will be provided in some areas along the newly constructed fiber route. Nearly 900 customers in the Pequot Lakes area are affected and the speeds that TDS/Arvig anticipates will be 1.5 to 10 Mbps, possibly higher in some areas. The cost per customer location passed is about $5600. A map of the area to be served is available on the link at http://www.tdstelecom.com/MediaRoom/StimulusFundingLocations.aspx) The project is scheduled to be finished in the fall of 2013.
Carver County	$6,000,000	Affordable middle mile broadband service in south central Minnesota to connect schools, libraries, and community colleges.	As of 9/30/12, approximately $6.13m of the overall project budget of $7.5m has been expended. The 89 mile base ring construction is complete. The three huts are under construction. Splicing and terminations for each of the community anchor institutions is being scheduled. The project is on schedule to go live in the first part of 2013 and complete by 7/31/13.

Southwest Minnesota Broadband Service (SMBS)	$12,800,000	SMBS will build FTTP (Fiber to the Premise) infrastructure to eight rural communities in Southwestern Minnesota.	SMBS construction is 99% complete. 290 miles of fiber have been constructed, passing 3500 homes and businesses. The last 15 miles was completed by Thanksgiving 2012. SMBS has activated 1800 homes and businesses with 600 to activate fall to early winter. Sales were higher than expected. The business model was built with 55% penetration the 1st year, 60% in year 2 and 65% in year 3. The initial take rate the first year was actually 67%. This is expected to grow to over 70% by next summer. SMBS is approaching cash flow positive and ahead of schedule regarding their business model. All local and state government state facilities are active on the network. This stimulus project has had great support from RUS and has come in ahead of time and within budget.
Enventis Telecom	$16,822,437	The Greater Minnesota Broadband Collaborative project is a Comprehensive Community Infrastructure (CCI) category, middle mile project to build a high-capacity Ethernet fiber network directly connecting anchor institutions throughout Minnesota, including health care facilities, educational institutions, libraries, public safety offices and state courts.	Construction began in July 2011 and as of 3/31/12, Enventis had completed approximately 176 new network miles and expended $13.2m of the overall project costs. Enventis' anticipated completion date is July 31, 2013.
Farmers Mutual Telephone Company	$9,652,956	Bring FTTP technology to Lac qui Parle County.	The project was planned to construct to 1713 locations. Conduit and fiber have been buried in the entire exchange of Dawson and the rural portions of the Madison exchange (the city of Madison is not a part of the project). Construction crews are now in the Boyd exchange burying conduit and fiber. Splicing crews are in the Dawson exchange in 4Q12 for another 30-45 days to complete before customers can be hooked up to the network. The cost to extend service to this area is $5,635 per location.

Federated Telephone Cooperative	$1,300,000	Build a FTTP system to deploy voice, video, and data services to rural Appleton, Minnesota.	This project planned to construct to 160 locations, with 132 property owners having provided permission to date. Draw downs on the RUS funding in the amount of $910,203 have been requested to date. Fiber and conduit have been buried and splicing to the 132 locations completed. Service has been turned up to more than 50 customers so far. The cost per location for extending the Federated Telephone Company network to 160 locations is $7,879.
Federated Telephone Cooperative	$2,987,000	Bring a FTTP voice, video, and data network to the Rural Morris, Minnesota exchange.	This project planned to construct to 420 locations, with 395 property owners having provided permission to date. Draw downs on the RUS funding in the amount of $2,245,777 have been requested to date. Fiber and conduit have been buried and splicing to the 395 locations completed. Service has been turned up to more than 200 customers so far. The cost per location for extending the Federated Telephone Company network to 420 locations is $7,369.
Halstad Telephone Company	$6,555,000	Install FTTP to 1,069 underserved locations in 5 towns and surrounding rural/farm areas in Norman and Polk Counties in Minnesota	Halstad Telephone won 3 ARRA awards and has completed all three projects. Work on the Minnesota portion was begun in July 2011, and resulted in 344 miles of new cable placed and plowing to 1306 locations
Minnesota Valley Television Improvement Corporation (MVTV)	$1,125,552	Continue building out its broadband internet network to unserved and underserved areas of west central and south central Minnesota.	As of November 2011, MVTV had completed all designated tower and backhaul construction as defined in its ARRA project. MVTV has also completed 50% or 750 of its new customer site installations. MVTV will complete its project in 2013.
Northeast Service Cooperative	$43,498,220	The Northeast Service Cooperative, in partnership with state and local agencies, schools and health care organizations, will implement a middle mile project to make dark fiber, wavelength services available to private sector providers in rural areas of northeast Minnesota.	Project includes 915 miles of underground fiber to 8 counties, 38 communities, 85 townships, 3 reservations. Critical institution connectivity increased from a projected 212 to 640 sites. Critical institution connectivity in the project is a min. of 1Gbps and up to 100Gbps and wavelength (future design support for up to 400Gbps) service availability.

			In 2012, 13 Optical Transport Network facilities across the region will become operational this year. Service activation will occur at approximately 160 critical service sites by project year end. This includes anchor sites of State of Minnesota, St. Louis County, city of Duluth, health care, schools, tribal and libraries. Construction for the project will continue in 2013 for connectivity at additional critical service sites.
Sjoberg's, Inc.	$866,000	FTTP in Roseau, Thief River Falls, and the hamlet of Fox, approximately 656 people stand to benefit, as do roughly 15 businesses and 3 community institutions.	Sjoberg's has started construction of the project with about 10% completed and moving forward briskly. Approximately 80 new locations will have broadband by the end of February 2013. The new headend equipment has been installed, upgrading service to all Sjoberg Internet customers. Sjoberg's has invested about $300,000 itself and requested $70,000 from its RUS award so far. They are targeting October 2013 for completion but have until September 2015 under program rules.
Wikstrom Telephone Company, Incorporated	$7,398,600	Deploy FTTP in 6 communities in Kittson, Marshall and Roseau Counties.	The project includes upgrading the backbone fiber network in 16 of the rural telephone exchanges that Wikstrom serves, extending coverage to an un-served area of 182 sq. miles with 723 customers and provisioning a Fiber to the Node ADSL2+ network for 2755 customers that will provide speeds up to 48Mbps. Other key components of this broadband upgrade are the installation of 74 miles of fiber optic cables and an upgrade of the microwave service to the NW Angle/Angle Inlet community and the fiber optic network to serve the islands in the northernmost part of the contiguous USA, of which most of the land mass is Red Lake nation reservation. Also included is an extension of fiber optic cables to serve the Agassiz National Wildlife Refuge in cooperation with their ARRA funding for upgrades to their facilities.

			GPON 2.4gbs Fiber to the Home (FTTH) system, with the installation of 414 miles of fiber optic cables, to 1163 homes or businesses, in the rural areas of Greenbush and Karlstad, and the small cities of Lake Bronson, Lancaster, Kennedy and Stephen, MN. The work in 2011 included completion of the digital microwave to the NW Angle ($210,000), installation of the 10gbs Gpon and IP router network ($2.1 million) and 96 fiber miles constructed with 27 miles of fiber for drops to 450 homes ($1.4 million). As of early November 2012 the project had constructed the FTTP network to 600 homes on 240 miles of fiber cable which was a little behind schedule due to late delivery of fiber and the September wild fire.
Winnebago Cooperative Telecom Association	$3,100,000 *Winnebago received $19.6 million but only 16% will go MN	Expand the existing portions of its fiber network by providing FTTP to rural portions of about 21 communities in Iowa and Minnesota.	Construction did not begin until August 2011 due to government regulatory and environmental permitting delays. Construction of the project is complete and customers are being converted which will take several months.
Woodstock Telephone Co Inc.	$15,184,424	Expand its fiber network into neighboring rural communities by providing FTTP in 15 communities located within 3 counties in Southwest Minnesota.	This is one of the few BIP projects nationally that has not made a draw on the loan. The project has encountered $4-6m in higher than projected fiber and wage costs. Woodstock sought a partnership with the counties of Lyon, Pipestone and Rock but that has been declined. Other financial support sources are being investigated.
Zayo Bandwidth, LLC	$13,382,593	The Connect Anoka County Community Broadband Network will make high-speed broadband services available to governments, businesses, community anchor institutions, and local Internet service providers in Anoka County and parts of Isanti and Ramsey Counties	As of October 2012 there were 234.55 miles in various stages of construction, with 229 miles spliced and ready for service. Approximately 87% of construction was complete. In total, the project was to install 286 miles of fiber and connect 145 community anchor institutions. Expected completion date Jan. 2013.
Lake County	$66,369,064	Lake County plans to offer FTTP advanced voice, video and data services to every home and business	The Lake County Project is a “Last Mile” project and covers Lake County and the eastern parts of St. Louis

		in Lake and eastern Saint Louis Counties.	County. In total there are 7 cities, 12 townships, and unorganized territories in both counties that will be served. Numerous contracts were awarded in 2012: Rohl Networks was awarded the construction of Phase I consisting of 75 miles starting in Two Harbors and surrounding rural areas, Silver Bay will start later this year. Transport equipment to power the 400G redundant ring will be powered by Cyan. Access equipment to provide the triple play has been awarded to Calix. A new headquarters building in Two Harbors was purchased and will be remodeled for a state of the art headquarters and data/control center for the network. Egan Company has been awarded the fiber management and installation of the Clearfield fiber equipment. Phase 2A consisting of over 300 miles of fiber from Duluth to Silver Bay is out for bid and construction planned to start the beginning of 2013. Phase 2B consisting of over 600 miles and which will complete 90% of the network build will be out for bids in 1Q13 with construction to start in the spring. Services are planned to be ready for testing in 1Q13 in Two Harbors. Lake County has named the Project "Lake Connections" and additional info can be found on the website www.lakeconnections.com
Arrowhead Electric Cooperative, Inc.	$16,137,484	Arrowhead Electric Cooperative, Inc. will build a last-mile FTTH network to serve northeastern Cook County. Because of the topography of the land and dense forestation, fixed wireless is not an option.	Construction began August 2011. To date, approximately 85 miles of underground construction, 120 miles of aerial construction and 71 miles of drop construction have been completed. Approximately $8m or nearly 50% of BIP funds have been drawn. The project is awaiting backhaul from NESC and until that is received, service cannot be delivered. NESC had connectivity scheduled for 2013 but is working diligently to have it by the end of 2012.

Red River Rural Telephone Association, Inc.	$360,000 *RRRT received $9 million but only 4% will go to MN	Red River Rural Telephone Assn will install 690 route miles of fiber-optic cable to serve six rural exchanges in Ransom, Richland, and Sargent Counties in ND; Wilkin County in MN; and Roberts and Marshall Counties in SD.	Red River passed 26 homes in Wilkin County, MN that are served in the rural portion of its Fairmount, ND exchange. 19 subscribed to service. Anticipated completion for this area is Spring 2013. Red River's average cost is $7145 per subscriber.
18 Projects	**$228,592,061**		
Grantee	**Amount**	**Description**	
Public Computer Center Projects:			
Leech Lake Reservation Business Committee	$1,722,371	Create seven new public computer centers and upgrade 10 existing facilities on three Ojibwe and Chippewa Indian reservations in Minnesota. They will provide training and support to youth, parents and small businesses.	Money returned to NTIA due to change in tribal leadership and discontinuation of the project.
Regents of the University of Minnesota	$2,862,333	Establish one new public computer center and improve 10 existing computer centers in Minneapolis and St Paul. They will offer computer and workforce training to vulnerable populations, including African-Americans and Hmong and Somali immigrants.	Ten upgraded public computer centers are operational and two new centers, with 11 of the centers having new broadband wireless connectivity. 143 workstations averaging 907 users per week. As of the end of the second quarter of 2012, there have been over 12,000 visits. In the second quarter, there were 2100 hours of training. The BTOP funds enabled the public computing centers to be open an additional 346 hours than if funding had not been available. Estimate the project is 79% complete as of 2Q12.
Broadband Adoption Programs:			
C.K. Blandin Foundation	$4,858,219	Blandin Foundation and partners will bring a network of resources to rural MN individuals and communities - especially those unemployed and seeking employment, small businesses, coalitions of government entities, and local leaders.	$4,259,303 of federal funds spent to date. Blandin Foundation and partners are at full speed implementing sustainable broadband adoption programs in greater Minnesota – through 5 statewide partners, ten regional

			entities and 11 demonstration communities (with uncounted local partners). Highlights include: *The University of Minnesota Extension Service is offering a growing menu of classes (8 courses now available) for small and medium size businesses around e-commerce topics, including mobile devices and web sites, with an emphasis on improving community technology vitality. *PC's for People has collected, refurbished and distributed over 2,000 computers to low-income families in greater Minnesota; at least three communities have created or in process of creating local efforts – Brainerd, Willmar and Thief River Falls. *DEED Workforce Centers and Adult Basic Education have created a sustainable model for incorporating standardized digital literacy training across greater Minnesota. *MN Renewable Energy Marketplace is conducting business technology training within their niche, increasingly interconnected to the MES business training. *MNSCU has created and is offering a hybrid online-in class experience that incorporates existing online career tools. Eleven demonstration communities have each allocated $100,000 ($1,100,000 total) to more than 70 local projects around digital literacy, broadband adoption, and increased sophistication of use while using the Intelligent Community approach to determine priorities and guide project development. 2012 saw continued implementation of training, completion of projects by

			demonstration communities and efforts to ensure sustainability of all activities.
3 Projects	**$9,442,923**	.	
Grantee	**Amount**	**Description**	
Multi-State Projects with a presence in Minnesota			
Communication Service for the Deaf, Inc. (CSD)	$14,988,657	Discounted broadband services and specialized computers, online technology training, public access to videophones at anchor institutions for the deaf and hearing impaired community. The project is based in South Dakota.	The main goal of CSD's Project Endeavor is to promote broadband access to deaf, deafblind and hard of hearing (d/hh) individuals by providing equipment and high speed Internet connections. Specifically for Minnesota, 373 d/hh residents received equipment or broadband subscriptions (exceeded allotment); $223,800 BTOP dollars directly impacted d/hh residents (exceeded allotment); seven major outreach events held in connection with other d/hh events; 17 Public Access Video Phones were installed; d/hh residents benefit from valuable web-based educational resources created in American Sign Language (ASL): Online Employment Curriculum "Your Road Trip – Destination Employment" http://www.projectendeavor.com/ and the Educational Video Library http://www.projectendeavor.com/VideoLibrary.aspx; content categories include: technology (computers, Internet, social media, email), Access to Communication (ADA, interpreters, relay, captioning, assistive devices), employment (broadband and employment, job searching skills, networking, using employment agencies), equipment (Android and IOS, iPad, laptops, videophones), advocacy (a human right, counseling, community support, domestic violence), health (diabetes, heart health, tobacco), finance (lower your electric bill, tax preparation, ID theft), general information. Two initiatives will be launched as the project finishes, one for introducing Video Remote Interpreting (VRI) using

			broadband and a second one for introducing captioning phones that use broadband.
Connected Nation, Inc.	$1,700,000	Expand existing broadband maps to reach more providers, give information at a more detailed level, and investigate broadband adoption in Minnesota.	Connect Minnesota is the state's "designated entity" for federal grant funding under NTIA's "State Broadband Initiative" (SBI) grant program. The grant work is focused on mapping, research on broadband adoption and utilization, and planning related to support of the state's broadband task force and associated work on broadband adoption and utilization development.
Connected Nation, Inc.	$2,761,171	Expand existing and planned maps to continue coverage for three additional years.	
Merit Network	$69,639,291	Develop 1172 miles of middle mile fiber to serve anchors, public safety, homes and businesses in the Upper Peninsula and Northern Lower Peninsula. Paths out of the region will reach the Duluth area.	About $350,000 of this project is being spent in Minnesota with no matching funds or in-kind coming from Minnesota. A spur across Wisconsin is being built to connect to the University of Minnesota-Duluth to interconnect the Research and Education Networks in the Great Lakes. In a joint build with Enventis, fiber has been placed under the St. Louis Bay in Duluth, saving both projects from any duplication of effort.
Mission Economic Development Agency	$3,724,128	The Latino Microenterprise Tech Net will create a public computer center in Minneapolis, where they will offer computer training and adult basic education in English and Spanish.	After some delays in procurement, the Latino Economic Development Center (LEDC) opened their part of this project in January 2011 with 17 computers at two sites. Classes in basic digital literacy are offered, mainly in Spanish. A focus of the project is small business and entrepreneurship, especially in the area of construction (using technology for construction bidding and estimates). In the first three quarters of 2012, 181 people have gone through training; since the project began in 2011, 691 people have been trained. Approximately $100,000 of grant funding has been made available for reimbursement for furniture, upgrades to site space, installation of computers, training, travel to train the trainer events and materials/supplies. Additionally,

			computers and software valued at $17,000 were provided and monthly IT consulting/maintenance (valued at $5,000) and Internet service at the two sites for 36 months (valued at $27,000) is provided to LEDC.
One Economy Corporation	$28,519,482	Publishes a portal of Twin Cities and national resources focusing on jobs, school, housing, money and health. Their Digital Connectors program will bring a mentor/community service project to the Twin Cities where youth will learn about broadband and pass on their knowledge to the community.	**The Hmong American Partnership in conjunction with One Economy and Comcast, run the Digital Connectors program to promote the natural affinity for technology by youth, enhancing their potential for spreading technology knowledge, and creating a culture of use. The program identifies young people, trains them and helps build leadership and work skills to enter the 21st century economy. Participants, ages 14-21, learn how to network computer labs, connect wireless access points, design computer training modules and create social media projects to put broadband and Internet technology to the greatest use in their communities. Additionally, participants learn about financial management, entrepreneurship and civic engagement. Digital Connectors are also motivated by community service. A major program requirement is to give back to their families, friends and communities what they have learned for a minimal of 56 hours of community service. The group has completed more than 200 hours of community service, technical support, and digital literacy trainings.
Portland State University	$3,318,031	A broad coalition of anchor institutions in Minnesota, New York, Central and South Texas, New Orleans, LA and Richmond, CA will implement an innovative online system of self-paced Learning Plans focused on digital literacy for adults.	The first six months of the grant involved development of consumer Learning Plans (led by Minnesota) that will be used in over 60 community locations around the country during the following 24 months of the grant, to serve economically vulnerable populations move across the digital divide. The Basic Computer Digital Literacy Standards recently developed through SPCLC will be integrated into the plans. In addition, the project will recruit and train numerous volunteer tutors to work with populations using

			the learning plans, using a learning plan developed by ProLiteracy. More than 800 learners in Minnesota used Learner Web in 2011-12, totaling more than 11,000 hours of instruction and with 77 BTOP tutors offering individualized instruction. The Minnesota Literacy Council serves as fiscal agent for the Minnesota portion of the grant, with management assistance from the St. Paul Community Literacy Consortium. In addition to St. Paul, Mankato, and Southwest Minnesota, the BTOP program expanded to Minneapolis, New Ulm, Northeast ABE, Roseville and Metro West.
University Corporation for Advanced Internet Development*	$62,540,162	Create an ultra-fast national network to colleges, universities, libraries, health care facilities and public safety entities, including some based in Minnesota.	**MN is part of the Northern Tier Network, due to get upgraded as part of this project with work beginning July of 2012 and concluding June of 2013 that will connect the research universities and other anchors to a nationwide 100Gbps network.
8 Projects	$187,190,922		
28 Total Projects	$425,225,906		

Appendix D

The Task Force identified a number of organizations working to improve digital literacy through the implementation of various programs and areas of focus across the State. These programs include but are not limited to the following.

- **Adult Basic Education (ABE)**[25] is available state wide at no cost to adult learners and is administered through the Minnesota Department of Education.

- **Community Technology Empowerment Project (CTEP) AmeriCorp**[26]
  The AmeriCorps Community Technology Empowerment Project bridges the digital divide for recent immigrants and low-income communities in Minneapolis and St. Paul Minnesota. AmeriCorps members help youth and adults use technology to better access social, civic, educational, and economic opportunities.

- **Computer commuter program in Lac Qui Parle County**[27]
  The LqP Computer Commuter is a mobile computer lab that tours Lac qui Parle to provide computer training and assistance to residents and local businesses especially in the communities of Bellingham, Boyd, Dawson, Madison, Marietta and Nassau.

- **Connected Nation's Every Community Online Project** [28]
  Allows any Minnesotan the ability to access self-paced online digital literacy training, and provides access to information on discounted access to broadband from participating providers and discounted, refurbished computers.

- **Digital Inclusion Fund (Minneapolis Foundation/City of Minneapolis**[29]
  The Digital Inclusion Fund is designed to increase technology access and skills among non-traditional users of technology in Minneapolis, including people with disabilities, people of color, low-income individuals, new immigrants, displaced workers, seniors and others.

- **Free Geek Twin Cities**[30]
  The mission at Free Geek Twin Cities is to reuse or recycle computers and to provide access to computers, the Internet, education and job skills in exchange for community service.

- **Learners Web – Minnesota Literacy Council**[31]
  Their mission is to share the power of learning through education, community building and advocacy.

- **Libraries** – there are about 360 public library buildings in Minnesota.
  Public libraries are playing a vital role in bridging the digital divide, the gap between "haves" and "have nots" in the digital age. The majority of libraries in Minnesota

[25] education.state.mn.us/AdultBasicEdFinder/
[26] wip.technologypower.org
[27] www.lqpeda.com/broadband-initiative/computer-commuter
[28] www.connectednation.org/low-cost-computers
[29] digitalinclusionfund.tmfportal.org/default.aspx
[30] freegeektwincities.org
[31] www.mnliteracy.org/educators/adult/technology/blog

provide free access to workstations and Internet services to those who could not otherwise access these resources. In addition, public libraries also provide training and assistance to those who lack technology skills or who have difficulty using Internet services. See www.publiclibraries.com/minnesota.htm for a directory of all libraries across Minnesota.

- **Minnesota Computers for Schools**[32]
  In partnership with the Minnesota Correctional Facility - Stillwater, Minnesota Computers for Schools trains inmates at the facility to refurbish and upgrade computer hardware donated by businesses. Components that are not refurbished are recycled. The refurbished systems provide affordable technology solutions for Minnesota K-12 public, private and charter schools, educational nonprofit organizations serving disadvantaged youth and students with special needs.

- **Minnesota Intelligent Rural Communities (MIRC) Project** – funded by the U.S. Department of Commerce through the Blandin Foundation to increase broadband adoption and digital literacy.

- **Minnesota Learning Commons**[33]

  Created to provide access to effective and efficient online learning. The public education partners include Minnesota State Colleges and Universities, University of Minnesota and Minnesota Department of Education along with Public K-12 schools.

[32] www.mncfs.org
[33] www.mnlearningcommons.org

The partnership also enhances the collaborative efforts of faculty, administration and staff by providing free relevant online resources. This site references a Digital Literacy site[34].

- **Northstar Digital Literacy Project** [35]
  Defines basic skills needed to perform tasks on computers and online. The ability of adults to perform these tasks can be accessed through online, self-guided modules. Included are basic computer digital literacy standards and modules in six main areas: Basic Computer Use, Internet, Windows Operating System, Mac OS, Email, and Word Processing (Word).

- **PCs for People**[36]
  PCs for People is a 501(C)(3) non-profit corporation with offices in St. Paul and Mankato, MN. PCs for People takes donated computers and rebuilds, refurbishes and redistributes them to people with limited access to technology. PCs for People provides educational experience, work training, internships, as well as volunteer opportunities.

- **Saint Paul Community Literacy Consortium**[37]
  The Saint Paul Community Literacy Consortium empowers the community by building literacy in a collaborative, inclusive, comprehensive manner. Enhanced literacy and improved basic skills support a high quality of life by providing preparation for meaningful employment and higher education, fostering better K12 outcomes and stronger families, and supporting economic development.

- **Technology Literacy Collaborative (TLC)**[38]
  TLC is a network of digital inclusion supporters committed to sharing best practices, advocating for technology literacy skills and access, and promoting collaborative efforts. The mission of the TLS is to promote digital inclusion.

- **University of Minnesota Broadband Access Project (BAP)**[39]
  A $3.6-million initiative of the University of Minnesota's Urban Research and Outreach-Engagement Center (UROC) to improve high-speed Internet (broadband) access, awareness, and use in four federally designated poverty zones in Minneapolis and St. Paul. The project supports development and enhancements of 11 community-based public computer centers (see map) for underserved populations, including African-Americans, Latinos, American Indian, and Asian and African immigrants.

  The goal of the BAP is to help eliminate the digital divide by enhancing and expanding access to high-speed Internet (broadband) in underserved communities to expand access to information about employment, education, health, and community and economic development.

[34] www.digitalliteracy.project.mnscu.edu
[35] www.digitalliteracyassessment.org
[36] www.pcsforpeople.com/index.php
[37] spclc.org/programs/digital-literacy-standards
[38] tlc-mn.org
[39] www.uroc.umn.edu/programs/bap.html

Appendix E

Home Phone cont.

Knology of the Plains, Inc.
www.knology.com 1-877-566-5649

Lismore Cooperative Telephone Company
www2.lismoretel.com 1-507-472-8748

Mediacom
www.mediacomcable.com 1-855-633-4226

Verizon Wireless
www.verizon.com 1-800-837-4966

Television

Knology of the Plains, Inc.
www.knology.com 1-877-566-5649

Mediacom
www.mediacomcable.com 1-855-633-4226

Developed as part of the Blandin Foundation MIRC project through a Department of Commerce grant.

SHOP Worthington
think local first

Nobles County Internet, Phone, Television and Wireless Phone Directory

This publication aims to provide a directory of available internet, home phone, television, and wireless phone companies servicing Nobles County along with each company's contact information. More detailed information may be attainable at each provider's website or over the phone. This list may not be fully comprehensive and some services may not be available in all areas.

CONNECT Minnesota

For a detailed listing of services available at your specific address you can access the Connect Minnesota website at http://connectmn.org/. On the home page click "Learn"; click "Interactive Map" and then click "Launch the Interactive Map". This will take you to a digital map of Minnesota. From here you can click on "find address" and then you will be able to enter in your home or business address which will bring up a list of internet, phone, and cable providers available in your area.

Mobile Phone

AT&T
http://www.att.com/shop/wireless/ 1-888-333-6651

Sprint
www.sprint.com 1-866-866-7509

Verizon Wireless
www.verizon.com/ 1-800-922-0204

Internet

AT & T
www.att.com 1-888-333-6651

Up to 3 Mbps	$19.95 per month
Up to 6 Mbps	$24.95 per month
Up to 12 Mbps	$29.95 per month
Up to 18 Mbps	$34.95 per month
Up to 24 Mbps	$44.95 per month

Evertek, Inc.
www.evertek.net 1-800-242-0151

Century Link
www.centurylink.com 1-888-680-4729

Up to 1.5 Mbps	Start at $19.95 for 5 years
Up to 7 Mbps	Start at $19.95 for 5 years
Up to 12 Mbps	Start at $19.95 for 5 years
Up to 20 Mbps	Start at $24.95 for 5 years
Up to 40Mbps	Start at $29.95 for 5 years

*12 month introductory prices when bundled

Frontier Communications of Minnesota
www.frontier.com 1-866-257-9076

Speeds up to 1 Mbps	$34.99 per month
Speeds starting at 3 Mbps	$49.99 per month

Hughes Network Systems, LLC
www.hughesnet.com 1-866-293-8945

1 Mbps/200 Kbps	$39.99 per month
1.5 Mbps/250 Kbps	$79.99 per month
2.0 Mbps/300 Kbps	$109.99 per month

Knology of the Plains, Inc.
www.knology.com 1-877-566-5649
Speeds up to 25/30 Mbps Call for pricing

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Internet cont.

Lismore Cooperative Telephone Company
www2.lismoretel.com 1-507-472-8748
Call for pricing

Mediacom
www.mediacomcable.com 1 855-633-4226

Up to 3 Mbps	See website
Up to 12 Mbps	or call
Up to 50 Mbps	for pricing

MVTV Wireless
www.mvtvwireless.com 1-320-564 4807

Up to 768 K	$44.95 per month
Up to 1.5 Meg	$47.95 per month
Up to 2.0 Meg	$52.95 per month
Up to 2.5 Meg	$57.95 per month

Sioux Valley Wireless
www.svtv.com 1-800-616-7888

Up to 2 Mb	$40.95 per month
Up to 3 Mb	$65.95 per month

SpeedNet
www.keyon.com 1-800-887-1234
Call for pricing

Verizon Wireless
www.verizon.com 1-800-837-4966
Call for pricing

ViaSat, Inc.
www.viasat.com 1-888-746-8960

7.5 GB	$49.99 per month
15 GB	$79.99 per month
25 GB	$129.99 per
month	

Home Phone

AT&T
hwww.att.com 1-888-333-6651

Century Link
www.centurylink.com 1-888-680-4729

Frontier Communications of Minnesota
www.frontier.com 1-866-257-9076

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Glossary

2G: 2G is the second generation of mobile communications standards. 2G is an early generation cellphone network protocol. A new generation of cellular standards has appeared approximately every tenth year since 1G systems were introduced in 1981/1982. Each generation is characterized by new frequency bands, higher data rates and non backwards compatible transmission technology.

3G: 3G is a term used to represent the third generation of mobile telecommunications technology. Services advertised as 3G are required to meet IMT-2000 technical standards, which provides for peak data rates of at least 200 kbps. However, with recent releases (3.5G and 3.75G) many services advertised as 3G provide higher speed than the minimum technical requirements for a 3G service and can provide mobile broadband access of several Mbps to smartphones and mobile modems.

4G: 4G is the fourth generation of mobile communications standards. A 4G system provides mobile ultra-broadband Internet access, for example to laptops with USB wireless modems, smartphones and other mobile devices. In March 2008, the ITU specified a set of requirements for 4G standards setting peak speed requirements at 100 Mbps for high mobility communications (such as for trains and cars) and 1 Gbps for low mobility communications (such as pedestrians and stationary users). Since the first release versions support much less than 1 Gbps peak bit rate, they are not fully compliant. However, the ITU said they can be considered "4G" provided they represent forerunners to compliant versions and are a substantial level of improvement in performance and capabilities with respect to the initial 3G systems deployed.

4G LTE: Fourth generation long term evolution is a wireless communications standard developed by the Third Generation Partnership Project Release 8 and 9. The LTE specification provides download peak rates of 300 Mbps and upload peak rates of 75 Mbps. ITU has allowed it to be marketed as 4G. The LTE wireless interface is incompatible with 2G and 3G networks, so that it must be operated on a separate wireless spectrum.

ADSL2+: Asymmetric Digital Subscriber Line 2+ is an upgrade of DSL and ADSL broadband service, with the download speed faster (asymmetrical) to the upload speed. ADSL2+ can achieve rates of 24Mbps down and 1.4 Mbps up depending on the "last mile" distance from the customer to the network aggregation point.

Android: Android is one of the operating systems that can be found in mobile phones and tablets. It is developed by Google.

ARRA: American Recovery and Reinvestment Act. On February 17, 2009, President Barack Obama signed into law the ARRA. The ARRA was an economic stimulus package intended to save and create jobs. Included in the funding was $7.2 billion for broadband programs.

BIP: Broadband Initiatives Program of the Rural Utilities Service of the U.S. Department of Agriculture to award loans, grants and loan/grant combinations with funding from the ARRA to facilitate broadband deployment in rural areas.

BTOP: Broadband Technologies Opportunity Program of the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce to award grants with funding from the ARRA to facilitate deployment of broadband infrastructure in unserved and underserved areas, to enhance broadband capacity at public computer centers, and to promote sustainable broadband adoption projects.

FCC: Federal Communications Commission. The Federal Communications Commission regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories. It was established by the Communications Act of 1934 and operates as an independent U.S. government agency overseen by Congress.

FTTH or FTTP: Fiber to the Home or Fiber to the Premise. A form of fiber optic communication delivery in which an optical fiber is run from the central office all the way to the premises occupied by the subscriber.

Gbps: Gigabit per second. Used to measure data transfer speeds of very high bandwidth connections. One Gbps equals 1000 Mbps or one million kbps.

GPON: Gigabit Passive Optical Network. GPON is one method of providing fiber to the home and is a point-to-multipoint access mechanism that enables one fiber from the provider's central office to serve multiple homes. GPON has a downstream capacity of 2.4888 Gbps and an upstream capacity of 1.244 Gbps that is shared among users. Each user's data is kept secure and private through encryption.

HD: High Definition. High definition television is digital broadcasting television system where the broadcast transmits in widescreen pictures with more detail and quality than found in analog television or other digital television formats.

iOS: iOS is an operating system that can be found in mobile phones and tablets. It was developed by Apple and is not licensed for installation on non-Apple hardware.

IPTV: Internet Protocol Television. IPTV is the delivery of television services over a packet switched network. IPTV differs from Internet television in that it has an ongoing standardization process and involves preferred delivery with set top boxes or other customer premise equipment.

ITU: International Telecommunication Union. ITU is the specialized agency of the United Nations which is responsible for information and communication technologies.

Kbps: Kilobits per second. Used to measure the data rate of a computer network connection. 1 kbps is equal to 1000 bits per second.

LOGIS: Local Government Information Systems (LOGIS) is a joint powers, intergovernmental consortium of Minnesota local government units. The mission of LOGIS is to "Facilitate leading-edge, effective and adaptable public sector technology solutions through the sharing of ideas, risks, and resources in a member-driven consortium."

Mbps: Megabits per second. Used to measure data transfer speeds of high bandwidth connections.
One Mbps equals 1000 kbps.

NTIA: National Telecommunications and Information Administration. NTIA is located within the U.S. Department of Commerce, is the Executive Branch agency that is principally responsible by law for advising the President on telecommunications and information policy issues. NTIA's programs and policymaking focus largely on expanding broadband Internet access and adoption in America, expanding the use of spectrum by all users, and ensuring that the Internet remains an engine for continued innovation and economic growth. NTIA oversees the State Broadband Initiative, which are the state entities collecting data to create the National Broadband Map. NTIA also awarded the BTOP grants.

OECD: Organisation for Economic Co-operation and Development. The OECD's mission is to promote policies that will improve the economic and social well-being of people around the world.

SD: Standard Definition. SD is a television resolution that is not considered high definition or enhanced definition. SD television is a digital broadcasting television system that is more vivid and has less noise than an analog system.

Smartphone: A device that combines telephony with computing. The term first appeared in 1997. A smartphone is a mobile phone built on a mobile operating system that allows you to run applications. It generally differs from a feature phone by its more advanced computing and connectivity capabilities.

Telehealth: Telehealth is the use of electronic information or communications technology to support healthcare, patient or provider education, public health and health administration. Telehealth encompasses prevention, promotion and treatment.

Telepresence: Using technology, telepresence allows a person to feel as if they are present or gives the appearance of being present at a place other than their true location.

Telework or Telecommute: Telework or telecommute is a work arrangement where the employee does not go to a central location to work. Instead the employee works from home or uses mobile technology to work from another location, such as a coffee shop.

VoIP: Voice over Internet Protocol. VoIP refers to a way to carry phone calls over the Internet.

VPN: Virtual Private Network. A VPN extends a private network and its functionalities across a public network like the Internet.

Wi-Fi or WiFi: Wireless Fidelity. Wi-Fi enabled devices link together without cables to form wireless local area networks.