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MN Broadband Advisory Task Force

The State of Broadband in MN

December 2010

Task Force Members:

JoAnne Johnson, chair
Ken Wolf, vice-chair
Bob Bass
Brent Christensen
Cindy Kevern
Todd Kruse
David Lind
Peter Lindstrom
Mike Martin
Mike Reardon
Pete Royer
Andrew Schriner
John Schultz
Lois Langer Thompson
Shirley Walz

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LETTER FROM COMMISSIONER GLENN WILSON

In 2008, the Governor appointed an initial task force, the Minnesota Ultra High Speed Broadband Task Force, to make recommendations on broadband goals and policies, and actions to achieve those goals. That task force consisted of a broad cross section of users from the private and public sector, as well as broadband providers from the cable, telephone and wireless industries. I had the privilege of serving on that task force. A comprehensive report, the culmination of the work of the task force, was submitted to the Governor and the Legislature in November 2009.

In response to that report, in 2010, the Legislature adopted Minn. Stat. 237.012 which contains broadband goals for the State of Minnesota. The Legislature also required the Commissioner of Commerce to provide annual reports on the progress of the State toward meeting those goals.

In light of the importance of broadband to the citizens of Minnesota, I believe that the report will be of most value to the Legislature if it also includes suggestions for how to achieve those goals. Therefore, I established the 2010 Minnesota Broadband Advisory Task Force to develop ideas in a group setting that includes various broadband users and providers.

I would like to take this opportunity to thank the 15 members of the Minnesota Broadband Advisory Task Force for the comprehensive work that they have done to assist in the preparation of a report to the Legislature on the State of Minnesota's progress towards reaching the broadband goals outlined in statute. I recognize that there was not much time in 2010 in which to complete the work that was requested, and appreciate their efforts to prepare the attached report.

In the 2010 report, the Minnesota Broadband Advisory Task Force has established the baseline measurements for compiling the required reports to the Legislature through 2015. In future years, the task force can focus more on recommendations for how to achieve the goals that have been set. Those recommendations would be of high value to broadband users and providers and include actions that could be implemented by the Legislature.

Sincerely,

Glenn Wilson
Commissioner

EXECUTIVE SUMMARY

Legislation passed in 2010 called for the establishment of the speed ranking and broadband ubiquity goals for Minnesota discussed below. The Commissioner of Commerce is charged with reporting Minnesota's progress towards attaining these goals to the legislature each year through 2015. The advisory task force, appointed by Commissioner Wilson in August of 2010, serves at the Commissioner's discretion. Its purpose is to collect information and advise him of facts that may be useful in reporting the state of broadband in Minnesota. The task force has fifteen members from a variety of backgrounds

What is Broadband?

In general, the term broadband refers to a network connection with high bandwidth. High-speed Internet connections that allow for transfers of information at rates far faster than those of dial-up modems also constitute broadband. Infrastructure technologies in use in Minnesota to deliver broadband connections include fiber/coaxial networks of cable providers, DSL service over the phone network, fiber to the home or premise, mobile and fixed wireless systems and satellite connections.

FCC Broadband Definition

When the Minnesota Ultra High-Speed Broadband Task Force (first task force) published its report to Minnesota legislators in November of 2009, the Federal Communications Commission (FCC) defined broadband as 768 kilobits per second (Kbps).

Since that time, the National Broadband Plan[1] (published by the FCC) recommends as a national broadband availability target that every household in America have access to affordable broadband service offering actual download (to the customer) speeds of at least 4 megabits per second (Mbps) and actual upload (from the customer) speeds of at least 1 Mbps.

Minnesota Broadband Definition

The speed goals set for Minnesota by the first Task Force and adopted by the legislature in 2010 are much higher than the FCC recommendation at 10 to 20 Mbps download and 5 to 10 Mbps upload availability by 2015. Those numbers however are in line with the type of deployment needed to reach another goal stated by the FCC of having 100 Mbps service to 100 million Americans by 2020.

[1] National Broadband Plan - http://www.broadband.gov/download-plan/

Minnesota Goals and Current Standings

Broadband goals were established for the State of Minnesota in the 2010 legislative session and reside in Chapter 237.012 of MN Statute. Those goals are:

Goal 1:

Universal access and high-speed: as soon as possible, but no later than 2015 all state residents and business 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.

Current status of Goal 1:

Estimate of Broadband Service Availability in the State of Minnesota By Speed Tier Among Fixed Platforms			
Download Speed Tiers	**Unserved Households**	**Served Households**	**% Households by Speed Tier**
At least 768 Kbps	64,647	1,830,480	96.59%
At least 1.5 Mbps	77,353	1,817,774	95.92%
At least 3 Mbps	118,313	1,776,814	93.76%
At least 6 Mbps	174,467	1,720,660	90.79%
At least 10 Mbps	301,312	1,593,815	84.10%
At least 25 Mbps	850,309	1,044,818	55.13%
At least 50 Mbps	937,613	957,514	50.53%
At least 100 Mbps	1,006,996	888,131	46.86%

Source: Connect Minnesota, October 2010

Figure 1 below shows the Density of Households Unserved by a Broadband Provider by Census Block.

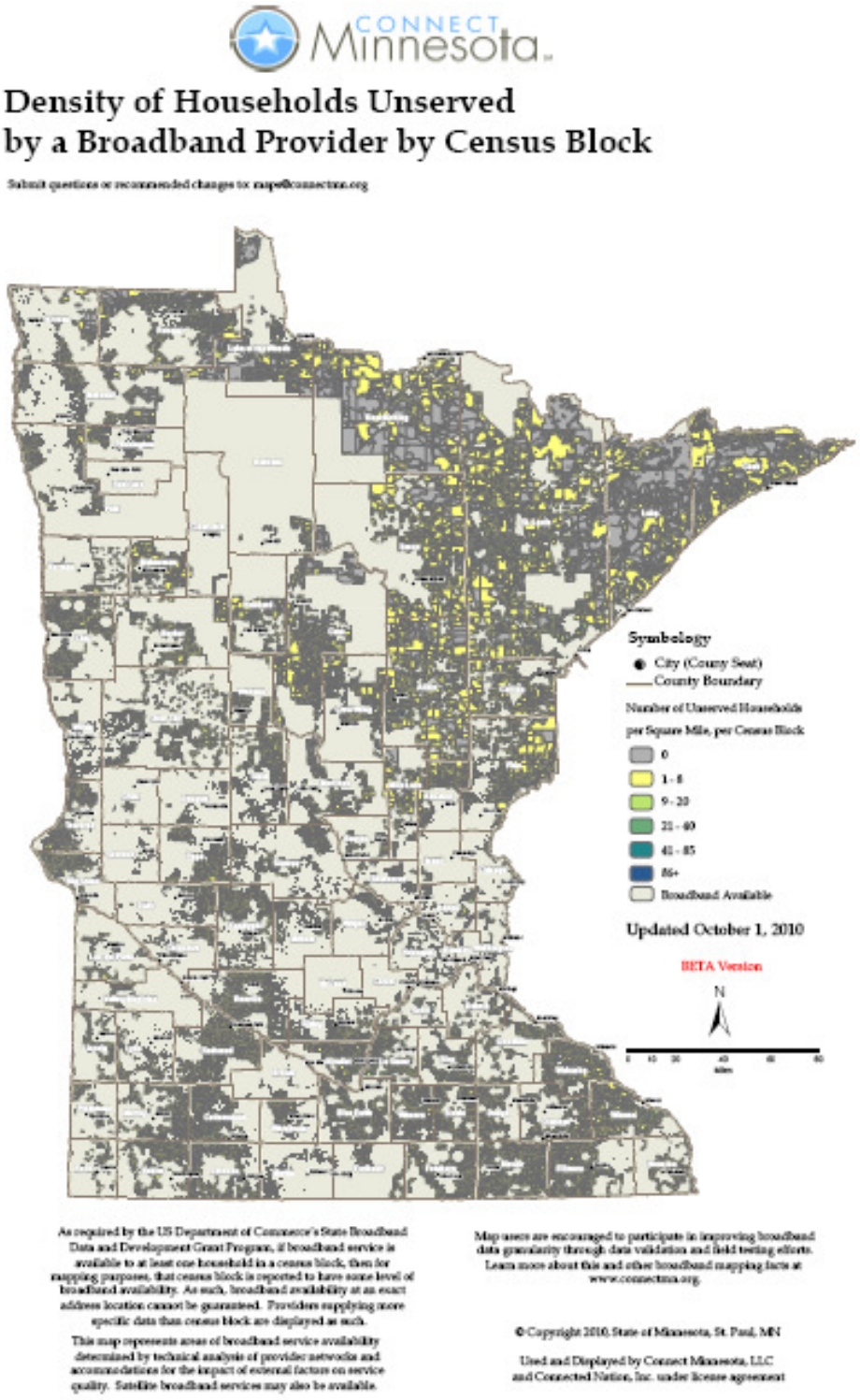


Figure 1 – Source: Connected Nation – Density of Households Unserved by a Broadband Provider by Census Block

Goal 2:

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

Goal 2a:

a. the top five states of the United States for broadband speed universally accessible to residents and businesses

Current status of Goal 2a:

According to Akamai's [2] Q2 2010 State of the Internet report, MN ranks 24th for average connection speed (4.5 Mbps). Delaware continues to lead all US states in average broadband speed, with an average broadband speed of 7.2 Mbps (see Figure 2). Overall, the US averages 4.6 Mbps in broadband speed.

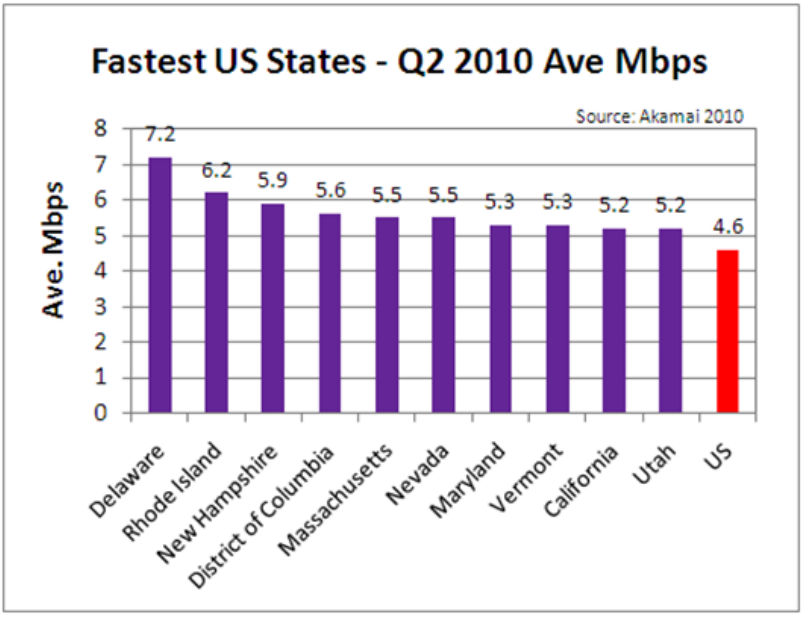


Figure 2 – Source: Akamai – Fastest Average Broadband Speed U.S. States, Q2 2010

Goal 2b:

b. the top five states for broadband access (availability). Note: access refers to broadband being available at a specific residence, business, or institution.

Current status of Goal 2b:

According to the FCC Minnesota ranks ~30th for broadband access in comparison to other states. Updated FCC statistics will be available in 2011.

[2] Q2 2010 - State of the Internet Report http://www.akamai.com/stateoftheinternet/

Goal 2c:

c. the top 15 when compared to countries globally for broadband penetration (adoption).

Current status of Goal 2c:

This task force has found no statistics readily comparable to measure this, but will continue to consult with various sources.

What the Task Force did find is Internet penetration rates by state published by Internet World Stats and global county rankings published by the Organization for Economic Co-operation and Development (OECD). The concern was that the state and global rankings were not statistically comparable in order to rank Minnesota in comparison to countries globally.

Significant Developments

National Broadband Plan

2010 brought several new developments at the national level that impact Minnesota and its broadband initiatives. The first notable event was the release in March 2010 of the National Broadband Plan by the FCC. The plan outlines national goals for broadband ubiquity and use. There are six broad goals outlined in the plan:

1. At least 100 million homes should have affordable access to actual download speeds of 100 megabits per second and actual upload speeds of 50 megabits per second by 2020.
2. The United State should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
3. Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.
4. Every community should have affordable access to at least one gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.
5. To ensure the safety of American communities, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
6. To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

In order to reach these goals, the FCC will initiate several rulemakings and additional Congressional action may be needed. The first steps outlined by the plan have to do with building the capacity of both the networks and the public knowledge and skill sets in order to foster competition and lower the costs. In addition, the FCC intends to make 500 megahertz of spectrum available for mobile broadband use by 2020, with 300 megahertz of that total available within the next three years.

There are action recommendations in the National Broadband Plan for improved frameworks for healthcare, education, economic opportunity, energy, government performance and public safety. These are much the same areas as those the Minnesota Broadband Advisory Task Force is interested in exploring in the next report.

ARRA Broadband Stimulus Programs

As part of the broader American Recovery and Reinvestment Act of 2009 (ARRA), two programs were created to directly address the need for increased broadband availability in the country. The National Telecommunications and Information Administration (NTIA) of the U.S Department of Commerce and the Rural Utilities Service (RUS) of the U.S. Department of Agriculture were given a total of $7.2 billion to provide both grants and loans to applicants that proposed building last mile or middle mile networks, public access sites or creating programs for increasing the use of broadband and Internet literacy. Funding was made available in five categories:

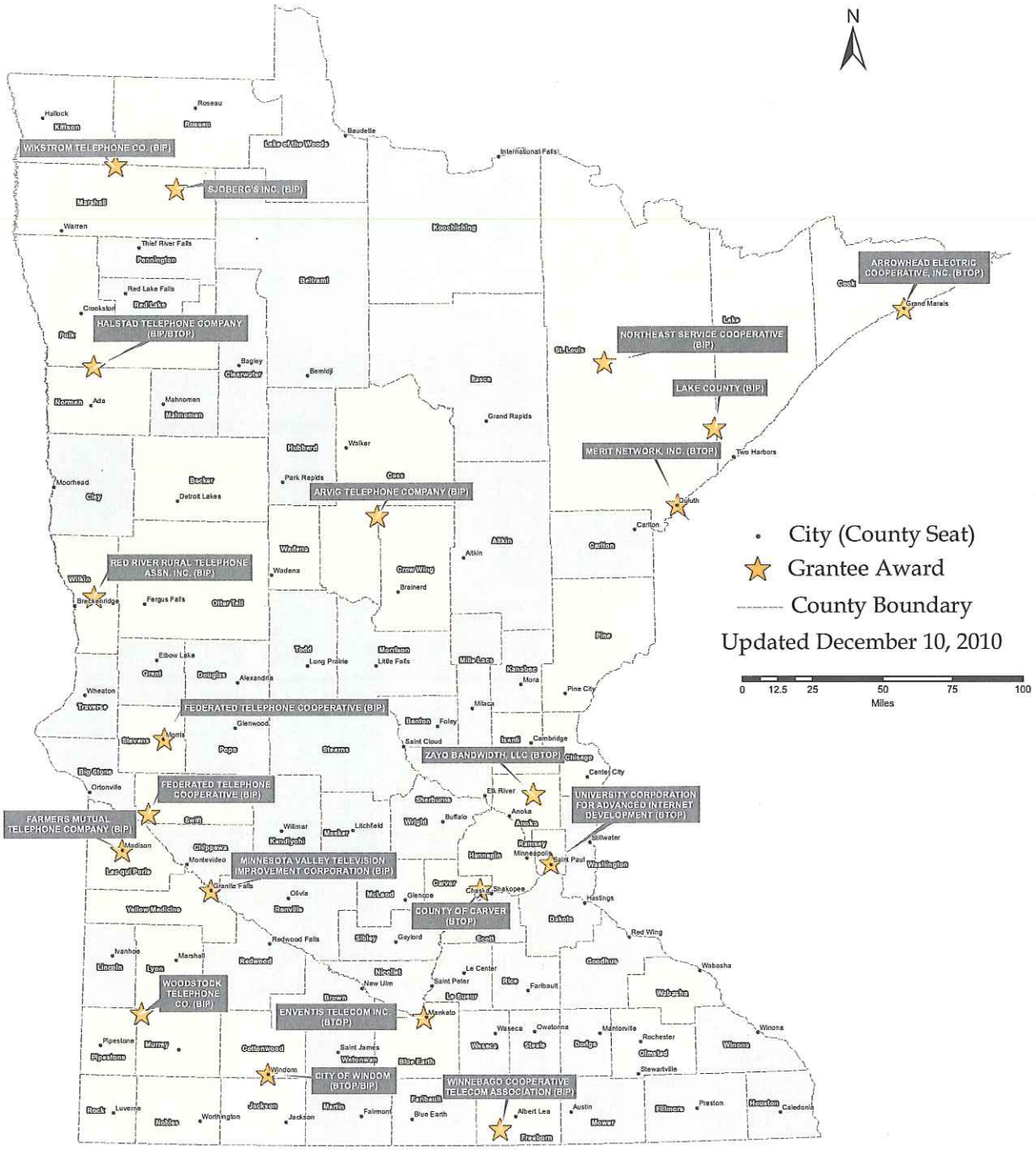
1. Last Mile Infrastructure
2. Middle Mile Infrastructure
3. Public Computer Centers
4. Sustainability
5. Mapping and Reporting

Minnesota applicants won over $238 million in grants and loans for projects that address all of these categories. Several multistate grants totaling $187 million also impact the state, including grants for further mapping and Internet2, bringing the total to over $425 million. See Figure 3 – Minnesota Broadband Technologies Opportunity Program (BTOP) /Broadband Initiatives Program (BIP) Grant Awardees

These projects are a lively combination of public, nonprofit, private and a few public/private partnerships that will be beneficial to Minnesota and will offer us a view into what works and what doesn't in the area of infrastructure builds and increasing penetration rates. There is a three year timeline for project completion which will provide for a full accounting by this task force within its life span. A further review of these projects is included in Appendix D on page 48 in the report.

Minnesota BTOP/BIP Grant Awardees

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



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.

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Future Intentions

This task force believes it should continue to build upon the knowledge gained this year to increase the information available to the proper authorities and to the citizens of the state in future reports to the Commissioner of Commerce. With this report, we are providing a baseline status of the state's statistical position. We also provide the baseline status of local governments, education, libraries and health care, those users of broadband who are funded in whole or in part by public money.

We anticipate a much fuller examination of the status of the state goals next year. Items on the list for investigation and exploration going forward include:

- stimulus projects progress
- the increased use of broadband in healthcare
- the funding and support of broadband technology in our schools
- digital literacy improvements
- the correlation between federal actions and Minnesota goals
- gaps in broadband connectivity for local governments
- solutions for the unserved populations in MN

The Department of Commerce and the Broadband Advisory Task Force will need the scheduled mapping updates from ConnectMN in order to track access and speeds at the levels defined in Minnesota Chapter 237.012, Section 1. The challenge will be in matching the goals set out in this section with the mapping. The speed goals defined in Chapter 237.012 do not line up with the levels of information collected by ConnectMN, as their criteria are by necessity set by NTIA for inclusion into national data sets and federal reporting. Still, the information they collect is very useful for our purposes.

More information is needed to track the level of broadband speeds that are currently available and identify those areas that are unserved or underserved within the definitions of the goals adopted by the State. This information is currently being gathered.
In addition, the Broadband Advisory Task Force believes it is important to track and monitor the following:

1. Construction, deployment, and adoption within those areas where ARRA funds are earmarked for construction of new broadband facilities.
2. Current data to include new extensions of existing facilities.

We look forward to our second year of work investigating and reporting on broadband in Minnesota so that we can advise the Commissioner and give decision makers and stakeholder's information that will be useful in moving our state forward economically and socially.

INTRODUCTION

Legislation passed in 2010 called for the establishment of the speed ranking and broadband ubiquity goals for Minnesota discussed below. The following provides a more in-depth analysis of the Task Force's research for this year.

LEGISLATIVE GOALS

Broadband goals were established for the State of Minnesota in the 2010 legislative session and reside in Chapter 237.012 of MN Statute. Those goals are:

Goal 1:

Universal access and high-speed: as soon as possible, but no later than 2015 all state residents and business 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.

Current status of Goal 1:

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At least 10 Mbps	301,312	1,593,815	84.10%
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At least 100 Mbps	1,006,996	888,131	46.86%

Source: Connect Minnesota, October 2010

Goal 2:

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

Goal 2a:

a. the top five states of the United States for broadband speed universally accessible to residents and businesses

Current status of Goal 2a:

According to Akamai's [3] Q2 2010 State of the Internet report, MN ranks 24th for average connection speed (4.5 Mbps). Delaware continues to lead all US states in average broadband speed, with an average broadband speed of 7.2 Mbps (see Figure 4). Overall, the US averages 4.6 Mbps in broadband speed.

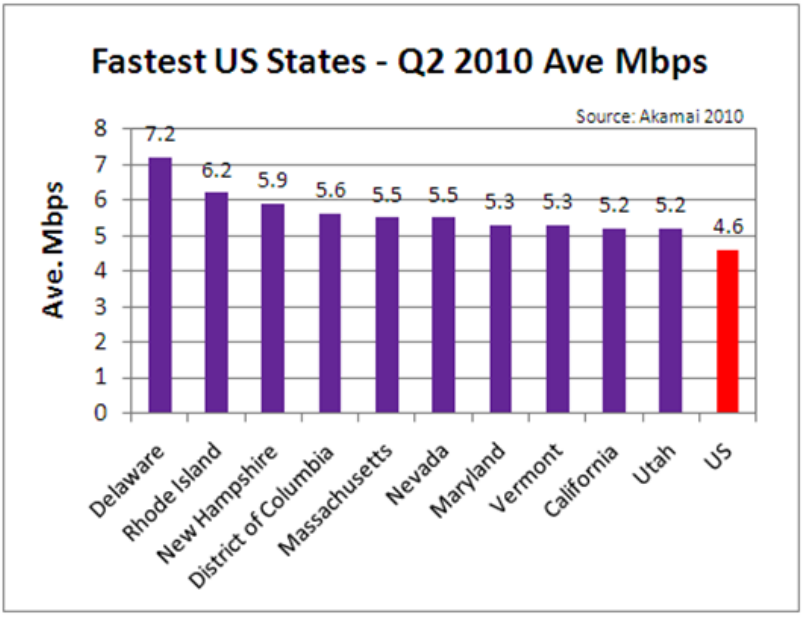


Figure 4 - Source: Akamai - Average Measured Connection Speed by State

Goal 2b:

b. the top five states for broadband access (availability). Note: access refers to broadband being available at a specific residence, business, or institution.

Current status of Goal 2b:

According to the FCC Minnesota ranks ~30th for broadband access in comparison to other states. Updated FCC statistics will be available in 2011.

[3] Q2 2010 - State of the Internet Report http://www.akamai.com/stateoftheinternet/

Goal 2c:

c. the top 15 when compared to countries globally for broadband penetration (adoption).

Current status of Goal 2c:

This task force has found no statistics readily comparable to measure this, but will continue to consult with various sources.

What the Task Force did find is Internet penetration rates by state published by Internet World Stats and global county rankings published by the Organization for Economic Co-operation and Development (OECD). The concern was that the state and global rankings were not statistically comparable in order to rank Minnesota in comparison to countries globally.

MINNESOTA SPECIFIC INFORMATION

In order to determine where broadband is available and at what speeds, this report will rely on data provided by the State of Minnesota.

In 2008 the State contracted with Connected Nation, through its subsidiary ConnectMN, to map broadband speeds. The first round of mapping, paid for by the State, got down to only county level of detail. Through the American Recovery and Reinvestment Act, the State Broadband Data and Development Grant program provided for more detailed mapping, to the census tract level. ConnectMN was again awarded the contract for this second round of mapping. ConnectMN received data from broadband providers; cable television companies, local exchange carriers (both incumbent and competitive), Internet service providers and fiber companies.

ConnectMN mapping projects have provided substantial data on the deployment of broadband facilities, both residential and business[4]. These percentages are based on the current FCC definition of 768 Kbps download/200 Kbps upload[5]. Here are some conclusions of the ConnectMN research:

1. 95.5% of households statewide are served by a broadband service, other than mobile.
2. 90.5% of rural households statewide are served by a broadband service, other than mobile.
3. 98.51% of all households are served by a broadband service, including all platforms.

[4] Connect Minnesota Residential Technology Assessment http://connectmn.org/_documents/MN_Res_FINAL_110410.pdf

[5] Appendix A gives examples of applications and speed levels needed

Broadband adoption – How does Minnesota Compare

The following results are from the October 2010 Center for Rural Policy and Development – Minnesota Internet Survey. The Center for Rural Policy and Development is based in St. Peter, MN and is a private, not for profit policy research organization dedicated to benefiting Minnesota by providing its policy makers with an unbiased evaluation of issues from a rural perspective.

Adoption rates for Greater Minnesota and the Twin Cities, 2001 – 2010

Greater Minnesota	2001	2002	2003	2004	2005	2006	2007/08	2010
Computer	60%	59%	65%	63%	62%	66%	73%	75.5%
Internet	46%	46%	57.5%	56%	54%	59.4%	68.2%	71.2%
Broadband	6.2%	9.7%	15%	21%	27.4%	39.7%	52.3%	65.5%
Twin Cities	2001	2002	2003	2004	2005	2006	2007/08	2010
Computer					73.1%	71.4%	77.9%	78%
Internet					64.3%	67%	74.4%	75.6%
Broadband					43.9%	57%	62.9%	73.2%

Major findings

- Statewide availability continues to spread geographically:
  - 76.8% of households report having computers
  - 73.5% (95.7% of those with computers) are connected to the Internet
  - 69.5% of households (94.3% of households with Internet) are accessing the Internet via broadband
- Computer and Internet adoption rates are up slightly from the last survey, taken in December 2007 and January 2008, when adoption rates were 75.9% for computers and 71.5% for Internet. Broadband adoption is up sharply, nearly 12 percentage points from 57.8% in 2007-08.
- In Greater Minnesota, computer, Internet and broadband adoption rates continue to grow and are catching up with the Twin Cities.
  - Computer ownership went from 73.0% in 2007-08 to 75.5%
  - Internet connections have gone from 68.2% in 2007-08 to 71.2% in 2010
  - Broadband adoption grew from 52.3% to 65.4%.
- High percentages of Minnesota households with Internet continue to engage in the most popular activities. Email is universal, but close behind is shopping, checking the news and banking. Other activities are also growing in use, such as doing work for an employer, communicating with a child's school or contacting a legislator or doctor. Greater Minnesota still lags behind the Twin Cities in many activities.

The similarity in the statistics from both sources leads the Task Force to believe that we have credible numbers.

SIGNIFICANT DEVELOPMENTS IN BROADBAND

The National Broadband Plan

2010 brought several new developments at the national level that impact Minnesota and its broadband initiatives. The first notable event was the release in March 2010 of the National Broadband Plan, published by the FCC. The plan outlines national goals for broadband ubiquity and use. There are six broad goals outlined in the plan:

1. At least 100 million homes should have affordable access to actual download speeds of 100 megabits per second and actual upload speeds of 50 megabits per second by 2020.
2. The United State should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
3. Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.
4. Every community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.
5. To ensure the safety of American communities, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
6. To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

In order to reach these goals, the FCC will initiate several rulemakings and additional Congressional action may be needed. The first steps outlined by the plan relate to building the capacity of both the networks and the public knowledge and skill sets in order to foster competition and lower the costs.

The FCC will attempt to restructure the Universal Service Fund (USF) and revamp Intercarrier Compensation (ICC) to subsidize ongoing build-outs of the terrestrial networks to support a move to an Internet Protocol (IP). They intend to do this in three stages.

Stage 1 – Lay the Foundation (2010 – 2011)

- Improve USF Performance & Accountability, establish Connect America Fund (CAF) and Mobility Fund, and design USF funds in a tax efficient manner to minimize the size of the gap.
- Take action to shift up to $15.5 billion over the next decade from High-Cost programs to broadband programs.
- Adopt a framework for ICC reform that creates a glide path to eliminate per-minute access charges while providing carriers an opportunity for adequate cost recovery.
- Examine middle-mile costs and pricing.

Stage 2 – Accelerate Reform (2012 – 2016)

- Begin making disbursements for the CAF.
- Broaden the universal service contribution base.
- Begin a staged transition of reducing per-minute rates for ICC.

Stage 3 – Complete the Transition (2017 – 2020)

- Manage the total size of the USF to remain close to its current size (in 2010 dollars) to minimize USF contribution burden on consumers.
- Eliminate the legacy High-Cost program, with all Federal government funding to support broadband provided through the CAF.
- Continue reducing ICC rates by phasing out per-minute rates for all originating and terminating telecommunications traffic.

In addition, the FCC intends to make 500 megahertz of spectrum available for mobile broadband use by 2020, with 300 megahertz of that total available within the next three years.

There are action recommendations in the National Broadband Plan for improved frameworks for healthcare, education, economic opportunity, energy, government performance and public safety. The Minnesota Broadband Advisory Task Force is interested in exploring similar areas in the next report.

The FCC has identified gaps in usage and issues that constrain the growth of broadband applications in the same areas. Many of the ideas in the proposed framework at the federal level will affect Minnesota. For example, the Rural Healthcare Pilot Program will be redesigned and may be available for Minnesota facilities to utilize in the future to increase the use of technology and help lower healthcare costs.

The federal agency also foresees using more effective support systems for broadband use by small and medium businesses, bringing robust broadband to the smart grid effort, revamping eRate support for schools and libraries and creating a nationwide interoperable wireless network for public safety. Any of these steps could be leveraged for the benefit of Minnesota.

ARRA Broadband Stimulus Programs

As part of the broader American Recovery and Reinvestment Act of 2009 (ARRA), two programs were created to directly address the need for increased broadband availability in the country. The National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce and the Rural Utilities Service (RUS) of the U.S. Department of Agriculture were given a total of $7.2 billion to provide both grants and loans to applicants that proposed building last mile or middle mile networks, public access sites or creating programs for increasing the take rate and use of broadband and Internet literacy. Funding was made available in five categories:

1. Last Mile Infrastructure
2. Middle Mile Infrastructure
3. Public Computer Centers
4. Sustainability
5. Mapping and Reporting

Minnesota applicants were awarded more than $238 million in grants and loans for projects that address all of these categories. Several multistate grants totaling $187 million also impact the state, including grants for further mapping and Internet2, bringing the total to over $425 million. See Figure 2 – Minnesota BTOP/BIP Grant Awardees

Ranking from Congressional Research Service

Top ten State-by-State Distribution of BTOP and BIP Funding

	BTOP Grants ($millions)	BIP Grants and Loans ($millions)
CA	423.766	24.466
KY	3.019	305.371
TX	96.515	206.762
OK	87.266	186.507
NC	125.287	146.708
MO	76.723	180.062
MI	123.905	123.855
MN	45.679	192.535
WA	174.557	62.37
IL	194.702	38.305
Totals:	1351.419	1466.941

Source: Congressional Research Service

Never before has Minnesota received such an infusion of funds dedicated to connecting Minnesota residents to the power of the Internet. Here is list of projects, award amounts and brief descriptions:

Grantee	Amount	Description
Infrastructure Projects:		
Arvig Telephone Company	$5,048,168	Bring high speed DSL service to unserved establishments within its rural service territory in Crow Wing County, MN.
Carver County	$6,000,000	Affordable middle mile broadband service in south central Minnesota to connect schools, libraries, and community colleges.
City of Windom	$12,800,000	SWMBG will build FTTP (Fiber to the Premise) infrastructure to eight rural communities in Southwestern Minnesota.
Enventis Telecom	$16,800,000	Affordable middle mile broadband service in Minnesota by connecting 70 community institutions to broadband, including connecting the Mayo Clinic to 12 rural health care facilities in southern Minnesota.
Farmers Mutual Telephone Company	$9,652,956	Bring FTTP technology to Lac qui Parle County.
Federated Telephone Cooperative	$1,300,000	Build a FTTP system to deploy voice, video, and data services to rural Appleton, Minnesota.
Federated Telephone Cooperative.	$2,987,000	Bring a FTTP voice, video, and data network to the Rural Morris, Minnesota exchange.
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
Minnesota Valley Television Improvement Corporation	$1,125,552	Continue building out its broadband internet network to unserved and underserved areas of west central and south central Minnesota.
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.
Sjoberg's, Inc.	$866,000	FTTP in Roseau, Thief River Falls, and the hamlet of Fox, serving approximately 656 people stand to benefit, as do roughly 15 businesses and 3 community institutions
Wikstrom Telephone Company, Incorporated	$7,398,600	Deploy FTTP in 6 communities in Kittson, Marshall and Roseau Counties.
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.
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.

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
Lake County	$66,369,064	Lake County plans to offer FTTP advanced voice, video and data services to every home and business in Lake and eastern Saint Louis Counties.
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.
Red River Rural Telephone Association, Inc.	$360,000 *RRRT received $9 million but only 4% will go to MN	Red River Rural Telephone Association will install 690 route miles of fiber-optic cable to serve six rural exchanges in Ransom, Richland, and Sargent Counties in North Dakota as well as Wilkin County in Minnesota, and Roberts and Marshall Counties in South Dakota.
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.
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.
Broadband Adoption Programs:		
C.K. Blandin Foundation	$4,858,219	Blandin Foundation and partners will bring a network of resources and support to rural Minnesota individuals and communities - especially those unemployed and seeking employment, small businesses, coalitions of government entities, and local leaders.
3 Projects	**$9,442,923**	.

Grantee	Amount	Description
Multi-State Projects with a presence in Minnesota		
Communication Service for the Deaf, Inc.	$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 primary based in South Dakota.
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
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
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.
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
Portland State University	$3,318,031	A broad coalition 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.
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
8 Projects	$187,190,922	
28 Total Projects	$425,225,906	

Source: Task force member compilation and Blandin on Broadband

These projects are a lively combination of public, nonprofit, private and a few public/private partnerships that will be beneficial to Minnesota and will offer a view into what works and what doesn't in the area of infrastructure builds and increasing penetration rates. There is a three year timeline for project completion which will provide for a full accounting by this task force within its life span. The following tables provide an overview of Minnesota awards by type, funding agency, technology, organization type and number of homes and businesses that will reach the Broadband Task Force 2015 minimum speed goals:

MN Awards by Type		
Type of Award	***Number of Awards***	***Total of Awards (million)***
Last Mile	***14***	***$148.9***
Middle Mile	***4***	***$79.7***
Computer Center	***2***	***$4.6***
Sustainability	***3***	***$5.1***
Mapping	***2***	***$4.4***
Total	***25***	***$242.7***

Source: John Schultz, U-reka Broadband

MN Awards by Technology		
Technology	***Number of Awards***	***Total of Awards (million)***
Fiber to the Premise (FTTP)	***12***	***$135.3***
FTTP and DSL	***1***	***$7.4***
DSL	***1***	***$5.0***
Wireless	***1***	***$1.1***
MiddleMile Transport	***4***	***$79.7***
Total	***19***	***$228.5***

Source: John Schultz, U-reka Broadband

MN Award by Organization		
Type of Awardee	***Number of Organizations***	***Total of Awards (million)***
Incumbent Phone and Carriers	***12***	***$81.7***
Incumbent Cable	***1***	***$.9***
Cooperative (non-phone)	***3***	***$44.8***
Power Cooperative	***1***	***$16.1***
Municipality	***3***	***$85.2***
Tribal Government	***2***	***$1.8***
Non-Profit & Education	***3***	***$12.2***
Total	***25***	***$242.7***

Source: John Schultz, U-reka Broadband

The following information is included to provide a baseline status of local governments, education, libraries and health care. The intent is to discuss the current state and outline future needs. These areas were chosen based on various levels of public funding used for broadband applications. Minnesota uses a complex, multilayered approach to delivering these services. The following sections provide an overview of the complexity of the funding and delivery of these services utilizing broadband.

LOCAL GOVERNMENT

Current State

There is an ever growing demand for local government to have increasing bandwidth to support the sharing and backup of data, implementation of high bandwidth-intensive technologies and provide improved response to public needs and shared services among government agencies. High speed broadband networks will equate to more transparent, efficient, and accessible government services. Currently cities, counties and townships require high-speed broadband to:

- enable improved connectivity between public agencies
- provide the electronic transfer of data between communities
- expand e-government services and communications for citizens
- aid in real-time communication for first responders and emergency management
- streamline the video court arraignment and electronic transmittal of evidence

"Town, city and county governments should be your lead anchor tenants. They have clear identifiable communications needs such as overhauling old, expensive technology, mobile workforce automation and improved community interaction that can represent tens if not hundreds of thousands of dollars in savings and revenue."

Craig Settles, Fighting the Good Fight – Bringing True Broadband to Your Community © 2010

Local governments also see access to broadband as a means to provide economic development by attracting business, retaining existing businesses, and encouraging entrepreneurship.

In Minnesota, there are a variety of infrastructure projects that involve local municipalities and counties. The three types of broadband projects being initiated are:

1. Wireless (both retail and public safety)
2. Fiber to the Premise
3. Community Anchor Institution Networks

The projects listed below are in varying stages of implementation. The Task Force has no analysis to determine the feasibility or degree of success of these projects.

There are several wireless projects such as:

- City of Minneapolis (Wi-Fi) operating in partnership with US Internet (USI)
- City of Chaska (Wi-Fi) owned and operated by Chaska
- City of Buffalo (Wi-Fi) owned and operated by Buffalo
- City of Austin owned by Austin Utilities Commission and operated by Southern MN Internet Group

In addition, there are several fiber to the premise based projects that provide a triple-play of services (voice, video and high-speed Internet). These include the:

- City of Windom, which operates and owns WindomNet
- City of Monticello operating and owned by Monticello with Hiawatha Broadband Communications (HBC) as a private provider partner
- Lac qui Parle County partnership with Farmers Mutual Telephone Company
- City of Barnesville
- City of Crosslake[6]

For many years there have been fiber-optic community anchor institutional networks managed by cities, counties, and school districts.

Stimulus Projects

There are also several projects that have recently received federal stimulus funding from the American Recovery and Reinvestment Act of 2009 (ARRA): the City of Windom received an ARRA grant to expand to eight surrounding communities; Cook County and Lake County for fiber to the premise (FTTP) projects; middle-mile networks for Anoka and Carver County being designed to connect government facilities. For a complete discussion of the stimulus grant projects, see pages 21-27.

Summary

While there is a high demand for high-speed broadband connectivity by local governments in Minnesota, there are also a large number of current projects being developed and constructed that assist with filling the gaps for connectivity. There are a variety of funding sources used for these project including local government bonding, revenue from the operations, NTIA stimulus grants, federal RUS loans, industry partnerships and other grants. Future survey work will need to be completed to determine any remaining gaps in broadband connectivity for local governments.

[6] Barnesville and Crosslake are the incumbent telephone companies for their communities

EDUCATION – K-12

History

The Minnesota Legislature established the Learning Network of Minnesota (LNM) as a statewide high-speed telecommunications network for higher education, K-12 public education and public libraries. The LNM is a series of interconnected networks with regional consortia managing and overseeing their own area networks. Using high-speed telecommunications transport, this interconnected set of networks provides access and delivery of information resources to students including Internet access, distance learning opportunities through interactive television (ITV) and on-line learning. It also provides a transport system for the state to share data electronically with K-12 schools.

Telecommunications Regional Organization

Critical to the operation of these state wide educational networks are the K-12 telecommunications access regions and the higher education telecommunications regions. Services provided by the K-12 telecommunications access regions and their coordinators include:

- Aggregation and coordination of service demands and needs
- Cooperative purchasing and procurement practices
- Coordinated application for federal E-rate telecommunications services discounts
- Wide area network operational support and maintenance
- Coordination and scheduling of distance learning activities via ITV
- Advocacy for the telecommunications access needs of member school districts and libraries
- Coordination with telecommunications service providers
- Links connecting schools to content resources for education and life-long learning
- Guidance and professional development for effective integration of technology

Not only do the regions provide a wide range of technical expertise to their members, which does not exist at the independent school district level, but the organization of regions throughout the state directly results in an aggregation of need, network efficiencies, technical support and reduction in overall resource needs that would not exist if school districts sought an equivalent level of telecommunications service and support independently. For more information on Minnesota telecommunications access regions, visit www.mitnmn.ning.com.

Telecommunications Funding for K-12 Education

Since 1996, the state has provided various levels of funding support for telecommunications costs for schools through three funding programs.

1. **Telecommunications Access Grant Program (TAG):**
   Between 1996-2000, TAG was a noncompetitive grant program that provided funding for telecommunications through eight telecommunications access regions throughout the state.

2. **Telecommunications Access Revenue Program (TARP) & Adjusted Marginal Cost Per Pupil Unit (AMCPU):**
   This combination of a per pupil formula and a supplemental entitlement based on projected costs was designed to address the issues of disparity that arise when a school district's enrollment does not generate sufficient funds to cover the cost of telecommunications through the per pupil formula approach. TARP/AMCPU funding was discontinued beginning with the FY2004-05 biennium.

3. **Telecommunications/Internet Access Equity Aid for Schools (Equity Aid):**
   School districts and charter schools are reimbursed for the approved cost for the previous year that exceed $15 multiplied by the adjusted marginal cost per pupil units (AMCPU) for the previous year OR reimbursement of approved costs with no per pupil unit limit if the school district or charter school is a member of an organized telecommunications access cluster that was in operation by July 1 of the previous funding year. All reimbursement is based on the costs after the federal E-rate discount has been subtracted. The $3.75 million appropriated in FY2010 was prorated at 46.5% as there was $ 8.024 million in requests.

Only the Equity Aid program is still in effect. Please see the graph below for a complete funding history. A fourth program, the federal E-rate Telecommunications Discount Program supplements state and local funding to help school districts with the costs of telecommunications services and Internet access.

4. **E-Rate:**
   E-Rate is a federal program that provides discounts (20 – 90%) on telecommunications services (Internet, Wide Area Network and telephone costs) to schools and public libraries based on free and reduced price lunch eligibility for students in the school district or school. Nonpublic schools are also eligible for this program. Telecommunications/Internet Access Equity Aid programs require public school districts to apply for E-rate in order to receive state funds for telecommunications access. The E-rate program generates millions of dollars in support for Minnesota schools each year through fees collected by service providers on customer telephone bills.

K-12 Telecommunications Funding Synopsis

The appropriation level of the state telecommunications funding programs for schools for each biennium is illustrated in the following table:

State funding	1996-97	1998-99	2000-01	2002-03	2004-05	2006-07	2008-09	2010-11
TAG	$15.5	$23	$5	0	0	0	0	0
AMCPU	0	0	$9.6	$9.6	0	0	0	0
TARP	0	0	$18.5	$15.3	0	0	0	0
Equity Aid	0	0	0	0	0	$7.5	$16.3	$7.5
State Total	$15.5	$23	$33.1	$24.9	$0	$7.5	$16.3	$7.5
Federal Funding								
E-rate	0	$24	$49	$44	$48	$43	$48	$23
Grand total	$15.5	$47	$82.1	$68.9	$48	$50.5	$64.3	$30.5

Note: dollars are expressed in millions; therefore, 4.8 indicate an appropriation of $4,800,000.

Conclusion

Minnesota lacks a state level coordinated plan for broadband access for K-12 school districts. The Minnesota Department of Education (MDE) does not provide coordination or guidance for broadband access. There is currently a vacancy for an E-rate liaison at MDE that has not been filled. The chart above demonstrates that K-12 state funding has been inconsistent and unstable not only for broadband but for technology in general over the last decade

Access to high speed broadband connectivity is a necessity for all schools. Without broadband today, school districts are severely disadvantaged in meeting the constitutional requirement providing a fair and equitable education for every student. Rural communities in Minnesota continue to be particularly challenged when it comes to obtaining broadband access. Broadband access needs to be provided in such a way that it is affordable and readily available to all districts regardless of location in order to provide equitable education to all Minnesotans.

E-rate has thus far been a stable source of funding it also causes some constraints; program and procurement rules restrict the ability of community and business entities to partner with K-12 schools without jeopardizing funding for the schools.

As schools move to incorporate more advanced technology curricular tools, the need for additional bandwidth will continue to grow. A comprehensive statewide approach that leverages the cooperation and collaboration of the K-12 Telecommunications Access regions, the federal E-rate program and state funding could help all districts achieve the level of bandwidth outlined in the State Education Technology Directors Association recommendation of 10 Mbps per 1,000 students right now and at least 100 Mbps per 1,000 students in the next three to four years.

EDUCATION – HIGHER EDUCATION

Learning Network of Minnesota

As stated in the K-12 section, the Learning Network of Minnesota (LNM) provides interconnected telecommunications services that support Minnesota's public higher education systems. The state's public higher education institutions are dependent upon the LNM for their digital access including a) administrative services, b) basic communications, and c) academic services and support.

The services provided by the LNM are based upon six geographically organized regional consortia. The goal of the regional consortia model is to benefit from economies of scale, access fairness and equity, and user participation in planning and operational outcomes. These consortia represent all University of Minnesota and MnSCU institutions. Collectively, approximately 60 campuses and higher education centers are linked across the state. Each consortium has a governing board representative of their member institutions. This model facilitates the ability for the LNM to meet unique regional service needs.

The LNM Board of Directors exists to provide governance and accountability for the LNM program at the statewide level. This Board is representative of the six regions and the two public higher education systems--the University of Minnesota and MnSCU. The Board also enables coordination and cooperation among regions in order to ensure efficiencies and widespread access to LNM services.

The regions are interconnected through a telecommunications network infrastructure managed by the Office of Enterprise Technology (OET) in cooperation with the two higher education systems and the six regional consortia. This network management approach supports full integration with the Internet, the State of Minnesota's MNET network and networks that serve the health care sector, K-12 school districts and public libraries. Global networks such as Internet2 are also interconnected.

LNM – Fiscal Model

Funding to support the LNM comes from a Legislative appropriation to the six regions with an additional ten percent match from the member institutions. Member institutions also contribute additional funding and/or staff support in their respective regions. The LNM appropriation is allocated to the regional consortia pursuant to guidance from the LNM Board. Funds are used by each regional consortium to support coordination activities, core network services and application support.

Collaboration / Partnerships

The LNM is built on collaboration – between schools within a region, between regions, between primary partners (U of M, MNSCU, and OET).

Cost Savings
Collaboration and a shared infrastructure can lead to savings. Each dollar of LNM support generates approximately two dollars of service when compared to providing the same service at the individual schools.

Customer Service
Regional organization maintains the ties to individual colleges and universities and allows the schools to retain substantial input into support levels, resource allocation and services provided.

Core Services
The LNM delivers essential network connectivity, without which colleges could not operate and provides all schools with distance learning technologies, enabling those schools to expand the distance learning services provided to students.

LIBRARIES

Public libraries overview and governance

"Under Minnesota law, counties are responsible for ensuring that residents have access to public library services. They do this by operating libraries themselves, contracting with cities that operate libraries, or obtaining library services through a regional entity. Counties and all cities that operate a public library must provide at least a minimum level of funding for library services. This amount varies widely among local governments and is based on either their tax capacity or population (whichever is less) or, for those counties and cities paying above this amount, what they spent for library operating expenses in previous years." (MN Department of Education)

"Libraries are the most frequent sites of broadband access outside the home. As more employers and government agencies automate services online, public libraries play an even more important role in ensuring access to the Internet, as well as training and support in using these resources."

John B. Horrigan, PhD., FCC

In 2008, 138 counties, cities, and regional entities operated 135 public libraries with 359 buildings statewide at a cost of $202 million. Per capita costs average $38.12. Approximately 2.9 million residents have library cards and 28.6 million visits were made to public libraries.[7]

Libraries as Internet access centers for the public

"U.S. public libraries are on the front lines of connecting people with essential government resources - including unemployment benefits, federal and state emergency assistance, tax filing and more. Nationally, 79 percent of libraries provide assistance to patrons applying for and accessing e-government services, up 23 percent from 2008-2009." (Minnesota reports this figure at 95.8 percent)[8]

7 MN Office of the Legislative Auditor - report on Public Libraries

[8] Source - Libraries Connect Communities: Public Library Funding & Technology Access Study 2009-2010.

E-Rate Funding[9]

Eligibility for public libraries is based upon the Minnesota statutory definitions of public libraries and is verified by the State Library Services Division of the Minnesota Department of Education. Many of the state's libraries work closely with educational consortia and file for E-Rate support along with them.

The table below shows a summary of the public access usage of the regional public library systems.

Regional Public Library Systems Summaries - Internet Computers and Users

REGION	Population	Public Internet Computers	Internet Users
STATE SUMMARY	**5,287,976**	**4,478**	**4,160,134**
Arrowhead Region	308,012	244	298,801
East Central Library	175,542	120	111,200
Great River Library	451,899	164	199,494
Kitchigami Library	163,723	56	101,552
Lake Agassiz Library	137,801	119	153,621
MELSA Region	2,871,434	2,553	1,925,490
Northwest Library	48,078	50	46,856
Pioneerland Library	164,425	231	263,038
Plum Creek Region	115,528	190	162,919
SELCO Region	490,018	393	505,561
TDS Region	225,264	254	231,665
Viking Region	123,436	87	131,225
Unaffiliated Total	12,816	17	28,712

Total is the number of individuals that have used Internet computers in the library during the last year.

[9] E-Rate is a federal program that provides discounts on telecommunications services (Internet, Wide Area Network and telephone costs) of between 20-90 percent to schools and public libraries based on free and reduced price lunch eligibility for students in the school district or school. Nonpublic schools are also eligible for this program.

Figure 5 below shows a map of the Minnesota Regional Public Library Systems.

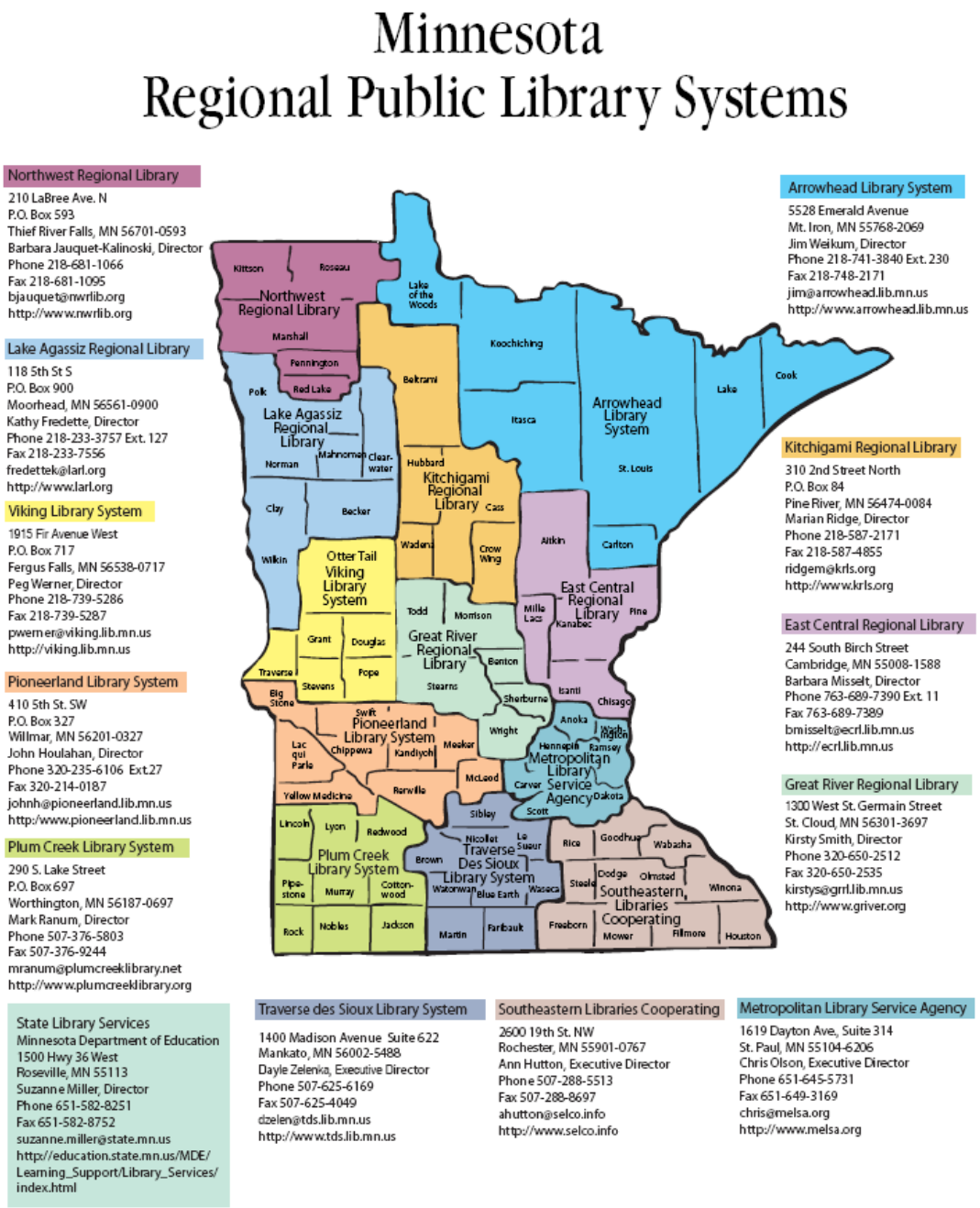


Figure 5 - Minnesota Regional Public Library Systems[10]

[10] http://education.state.mn.us/mdeprod/groups/Library/documents/Maps/003530.pdf

Summary

Access to high speed broadband connectivity is a necessity for all public libraries. Every day Minnesota residents use public library computers to complete job applications, apply for citizenship, connect with family and complete distance learning classes. Most employers now accept only online job applications. According to the Office of Management and Budget/E-Government, "*the use of Internet-based technologies to make it easier for citizens and businesses to interact with the Federal Government, save taxpayer dollars, and streamline citizen participation*." States, counties and cities are also focused on this objective and look to public libraries to provide access and training needed for all residents to participate in online activities successfully.

As public libraries continue their role in providing lifelong learning and academic support, bandwidth requirements will continue to increase and outpace the ability to support the demand.

To support Minnesota residents' access to broadband, public libraries will need state and local funding to:

- Increase the number of computers
- Maintain and increase open hours to access computers
- Develop training for new users as well as intermediate and advanced users
- Train staff on new and emerging technologies
- Increase broadband speeds

HEALTHCARE

In the next few years many healthcare providers and healthcare organizations will be focusing on demonstrating meaningful use of Healthcare Information Technology (HIT). On February 17, 2009, President Obama signed into law the American Reinvestment and Recovery Act (ARRA) stimulus bill. A component of ARRA provides an incentive program to stimulate the adoption and use of health information technology, especially the adoption an implementation of Electronic Health Records (EHR). In total nationwide ARRA funding for healthcare represents $147.7 billion, of which $19 billion is designated for HIT. Access to these funds will require healthcare organizations to comply with new regulations that will dictate requirements for an eligible professional or hospital to meet to achieve "Meaningful Use" incentives. In addition, these new regulations will enforce a set of standards, implementation specifications, and certification criteria for EHR technology. As a prerequisite to the implementation of any EHR is access to cost-effective high-speed broadband connectivity. The state's broadband goals will enable Minnesota to continue as a leader in providing high-quality, cost-effective, accessible healthcare while at the same time provide a foundation for accessing ARRA funding for the state's healthcare providers and provider organizations.

Access

Many Minnesota citizens would benefit from having reasonably priced high-speed Internet available to their organizations and homes. The lack or high cost of high-speed broadband can prevent a hospital, clinic or senior care center from offering many existing technologies. Homebound consumers, in particular those who live outside population centers, could take advantage of home healthcare applications for remotely monitoring and sharing their blood pressure, glucose readings, or heart rates with the provider. People across the state could take advantage of e-visits, capabilities coming into the market for virtual Web video delivery of experience for many common consultative and some diagnostic activities; and avoid the time, travel, hassle, expense and exposure of visiting a clinic. People can telecommute for a variety of business functions (e.g., coders, billers or transcriptionist) and when it may be necessary to provide socially distant working conditions in the case of an epidemic situation. Additionally, providers and consumers would be able to access and share medical information to ensure accurate information is available when needed.

Extending Quality Services

High-speed broadband provides healthcare organizations the opportunity to offer advance specialty services through telehealth applications such as electronic Intensive Care Unit (eICU), telepsychiatry, and teleradiology. These and other similar applications bring highly trained specialists to communities that cannot otherwise offer these services locally. As a

result, patients are treated earlier in their disease process and can remain in their community.

Cost

Everyone is experiencing the growing cost of healthcare. As baby boomers age, healthcare costs are projected to increase far above what the current model can support. Tele-health and e-care Web video delivery services, which require high-speed broadband, can support the changes that are needed in the current healthcare delivery system to make it more affordable. For example, by providing high-speed broadband access to every home, the current healthcare model can change for many. Home monitoring and home healthcare applications can prevent acute illness that drives costs up and assist in daily maintenance of many conditions at much less cost than expensive office visits. In addition, having people leave their homes and communities to seek distant specialty care is extremely costly. Patients, as well as family members, must often take time off work and be away from home when they need to travel for care that is not offered locally.

FUTURE INTENTIONS

This task force believes it should continue to build upon the knowledge gained this year to increase the information available to the proper authorities and to the citizens of the state in future reports to the Commissioner of Commerce. With this report, we are providing a baseline status of the state's statistical position. We also provide the baseline status of local governments, education, libraries and health care, those users of broadband who are funded in whole or in part by public money.

We anticipate a much fuller examination of the status of the state goals next year. Items on the list for investigation and exploration going forward include:

- stimulus projects progress
- the increased use of broadband in healthcare
- the funding and support of broadband technology in our schools
- digital literacy improvements
- the correlation between federal actions and Minnesota goals
- gaps in broadband connectivity for local governments
- solutions for the unserved populations in MN

The Department of Commerce and the Broadband Advisory Task Force will need the continued scheduled mapping updates from ConnectMN in order to track access and speeds at the levels defined in Minnesota Chapter 237.012, Section 1. The challenge will be in matching the goals set out in this section with the mapping. The speed goals defined in Chapter 237.012 do not line up with the levels of information collected by ConnectMN, as their criteria are by necessity set by NTIA for inclusion into national data sets and federal reporting. Still, the information they collect is very useful for our purposes.

More information is needed to track the level of broadband speeds that are currently available and identify those areas that are unserved or underserved within the definitions of the goals adopted by the State. This information is currently being gathered.
In addition, the Broadband Advisory Task Force believes it is important to track and monitor the following:

1. Construction, deployment, and adoption within those areas which ARRA funds are earmarked for construction of new broadband facilities.
2. Continue to update current data to include new extensions of existing facilities.

We look forward to our second year of work investigating and reporting on broadband in Minnesota so that we can advise the Commissioner and give decision makers and stakeholder's information that will be useful in moving our state forward economically and socially.

ACKNOWLEDGEMENTS

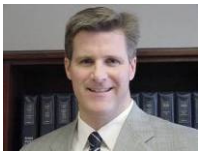
This Task Force would like to thank the Commissioner for our appointment and allowing us to provide input regarding the current state of broadband in Minnesota. We would also like to acknowledge the work done by the Ultra High Speed Broadband Task Force, the Center for Rural Policy and Development, the Blandin Foundation, Connect Minnesota and advisory board member who contributed to this report.

We look forward to continuing our efforts into 2011 and working with the new Commissioner to progress the state of broadband in Minnesota.

APPENDIX A – BROADBAND ADVISORY TASK FORCE BIOS

JoAnne Johnson, appointed as Chair of the Task Force. Ms. Johnson, a resident of Eden Prairie, MN, is the Manager of Government and External Relations for Frontier Communications' Central Region States. Frontier serves rural and southern metro exchanges in Minnesota. Prior to joining Frontier, Ms. Johnson worked for telecommunications provider Onvoy, Inc. and served as an economic development officer for Congressman Collin Peterson.

Ken Wolf, appointed as Vice-Chair of the Task Force. Mr. Wolf is a resident of Rosemount, MN. Prior to his retirement, Mr. Wolf served as Electric Reliability Administrator at the Department of Commerce; served in the Minnesota House of Representatives for ten years, including a term as chair of the House Regulated Industries Committee; was on the Burnsville City Council for ten years; and also has 28 years of experience at Control Data.



Bob Bass, President, External and Legislative Affairs for AT&T in Minnesota. Mr. Bass has been with AT&T for 13 years. His prior experience includes positions at Nevada Bell, 12 years with the State of Nevada, and service on the Nevada Commission on Educational Technology.

Brent Christensen, Madelia, Minnesota, is currently the President/CEO of the Minnesota Telecom Alliance, the state trade association that represents over 80 independent telecommunications companies, over 100 affiliate telecommunications companies and 250 associate members. Mr. Christensen's prior experience includes serving as vice president/general manager of Christensen Communications Company, a family owned incumbent local exchange carrier in Madelia, MN and as a deputy sheriff in Travis County, TX.

Cindy Kevern, Director of Information Services, Anoka County. Ms. Kevern oversees the Anoka County's broadband project and with private partner, Zayo Bandwidth, and was a recent recipient of broadband stimulus funding which will be used to deploy 286 miles of fiber throughout the county. Prior to joining Anoka County in 1999, Ms. Kevern worked for Ramsey County for 11 years.

Todd Kruse is president of Thought Leadership Management, LLC, a public affairs and strategic management consulting firm. He resides in Inver Grove Heights.

David Lind, Prior Lake, MN, is director of information services at Allina Hospitals & Clinics where he provides strategic direction and operational management for 33,000 users in 150 locations. Mr. Lind's prior work experience includes positions with Dain Rauscher, MSI Insurance, and Cummins Engine (Onan).

Peter Lindstrom is mayor of Falcon Heights and a member of the Minnesota High Tech Association (MHTA). MHTA's vision is to make Minnesota a world leader for technology-based industry.

Mike Martin is the executive director of the Minnesota Cable Communications Association, a trade group of companies providing franchised cable television services to communities throughout Minnesota.

Mike Reardon is the Cable Communications Officer for the City of St. Paul. Mr. Reardon has over 20 years experience at the municipal level with the administration and development of broadband, telecommunications and cable television policy in Minnesota.

Pete Royer is director of Little Crow Telemedia Network which provides bandwidth to 18 school districts in West Central Minnesota. Mr. Royer also serves as co-chair of the Minnesota Telecommunications Coordinators, a collection of K-12 regions all with Internet and distance learning cooperatives.

Andrew Schriner is director of Government Relations for Qwest. Qwest is the largest broadband provider in Minnesota.

John Schultz, president of U-reka Broadband Ventures, provides planning, design and project management to municipalities, competitive and incumbent telecommunications providers. U-reka Broadband Ventures is a partner to at least three projects that have been awarded federal stimulus funding for broadband. Mr. Schultz's prior work experience in the telecommunications industry includes positions at FTTH Communications, Seren Innovations, Hickory Tech and Sprint.

Lois Langer Thompson is the director for the Hennepin County Library system and led the ongoing consolidation of the Hennepin County Library and Minneapolis Public Library. Ms. Thompson is also the current chair of the Metropolitan Library Service Agency.

Shirley Walz is a senior director of technology at Thomson Reuters. Shirley participated in the ACE Leadership program sponsored by the Minnesota High Tech Association and has collaborated with the "Gig Group" organized by the City of Eagan to explore broadband build out.

APPENDIX B – APPLICATION UPLOAD/DOWNLOAD RANGES

Upload & Download Speed Range	Applications		Uses in Minnesota
500 Kbps – 1 Mbps	Voice over IP SMS 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
1 Mbps – 5 Mbps	Web Browsing (complex sites) Email (larger size attachments) Remote Surveillance	IPTV-SD (1-3 channels) File Sharing (small/medium) Telecommuting (ordinary) Digital broadcast video (1 channel) Streaming Music	• Cisco VPN for remote connections • Clay County network connection in 2008 - 3 T1s (4.5 Mbps) • Home based medical and dental transcription (telecommuting ordinary)
5 Mbps – 10 Mbps	Telecommuting (converged services) File Sharing (large) IPTV-SD (multiple channels) Switched Digital Video Video on Demand SD Broadcast SD 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	• Minnesota Library Information Network (MnLINK) • Home-based customer service delivery (telecommuting converged services) • Online medical visit – basic (Low-Definition Telepresence)
10 Mbps – 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		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 (Source: Broadband & Communities presentation by Andrew Michael Cohill, Ph.D. and Pres. Design Nine, Inc. on Feb. 19, 2009) • Cisco's TelePresence requires 15 MB symmetrical (Source: The Extaflood presentation on Oct. 24, 2008 by Bret Swanson, Center for Global Innovation) The Cisco TelePresence System 500 website Q & A indicates that bandwidth requirements "will depend upon the resolution (720p or 1080p) being used. Generally, between 2 and 3 Mbps per screen is used." • Wireless access points • LOGIS link to city, police, utility billing, financial connections via citrix farms, Internet connection
100 Mbps – 1 Gbps	HD Telemedicine Multiple Educational Services Broadcast Video Full HD Full IPTV Channel Support e.Government (small counties)	Video on Demand HD Gaming (immersion) Remote Server Services for Telecommuting	• All local application on city network • LOGIS fiber connections to the State • Current Clay County network connection
1 Gbps – 10 Gbps	Research Applications Telepresence (using uncompressed high-definition video streams) Live Event Digital Cinema Streaming e.Government (large counties)	Telemedicine Remote Visualization and Virtual Reality Movement of Terabyte Datasets Remote Supercomputing	• Internet 2 • University of Minnesota R&D • MNSCU R&D • Private college R&D • Public service applications for large counties
10 Gbps – 100 Gbps	Supercomputer Center Interconnection Access to the Large Hadron Collider in Switzerland ESnet is receiving $62 million to build a 100Gbps network for "big science" applications.		• University of Minnesota R&D • Internet2

APPENDIX C – REPORT REFERENCES

1. Blandin Foundation – Community Guide to State and National Broadband Policy
2. Center for Rural Policy and Development – 2010 Minnesota Internet Survey
   Looking at the growth of broadband access and use for clues to what's next
3. Minnesota Regional Telecommunications access regions – www.mitnmn.ning.com
4. Connect Minnesota – Residential Technology Assessment
5. Minnesota Ultra High-Speed Broadband Task Force Report

APPENDIX D – ARRA BROADBAND STIMULUS PROGRAMS

Last Mile Projects:				
Grantee	**Amount**	**Description**	**Homes, Businesses and Critical Community Facilities Passed**	**Meets Task Force 2015 Speed Goals**
City of Windom-Southwest Minnesota Broadband Services	$ 12,800,000	SWMBG will build FTTP (Fiber to the Premise) infrastructure to eight rural communities in Southwestern Minnesota.	3,700	Yes
Farmers Mutual Telephone Company	$ 9,652,956	Bring FTTP technology to Lac qui Parle County. Network will serve over 1,800 passings in partnership between Farmers Mutual Telephone and Lac qui Parle County	1,738	Yes
Federated Telephone Cooperative	$ 1,300,000	Build a FTTP system to deploy voice, video, and data services to rural Appleton, Minnesota.	160	Yes
Federated Telephone Cooperative.	$ 2,987,000	Bring a FTTP voice, video, and data network to the Rural Morris, Minnesota exchange.	430	Yes
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	1,069	Yes
Red River Rural Telephone Association, Inc.	$ 360,000 *RRRT received $9 million but only 4% will go to MN	Red River Rural Telephone Association will install 690 route miles of fiber-optic cable to serve six rural exchanges in Ransom, Richland, and Sargent Counties in North Dakota as well as Wilkin County in Minnesota, and Roberts and Marshall Counties in South Dakota.	21	Yes
Sjoberg's, Inc.	$ 866,000	FTTP in Roseau, Thief River Falls, and the hamlet of Fox, serving approximately 656 people stand to benefit, as do roughly 15 businesses and 3 community institutions	278	Yes

Wikstrom Telephone Company, Incorporated	$ 7,398,600	Deploy FTTP and ADSL 2+in 6 communities in Kittson, Marshall and Roseau Counties.	3918	Yes
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.	515	Yes
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.	3,600	Yes
Lake County	$ 66,369,064	Lake County plans to offer FTTP advanced voice, video and data services to every home and business in Lake and eastern Saint Louis Counties.	16,100	Yes
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.	4,746	Yes
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.	1,185	Yes
Minnesota Valley Television Improvement Corporation	$ 1,125,552	Continue building out its wireless broadband internet network to unserved and underserved areas of west central and south central Minnesota.	23,679	No
Last Mile Projects: 14	**$ 148,884,248**		**61,139**	
Middle Mile Projects:				
Grantee	**Amount**	**Description**	**Critical Community Facilities**	**Miles of Fiber Network**
Carver County	$ 6,000,000	Affordable middle-mile broadband service in south central Minnesota to connect schools, libraries, and community colleges.	86	132

Enventis Telecom	$ 16,800,000	Affordable middle-mile broadband service in Minnesota by connecting 70 community institutions to broadband, including connecting the Mayo Clinic to 12 rural health care facilities in southern Minnesota.	74	418
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.	800	915
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	145	286
Middle Mile Projects: 4	**$ 79,680,813**		**1105**	**1751**
Public Computer Center Projects:				
Grantee	**Amount**	**Description**	**New Computer Centers**	**Upgraded Computer Centers**
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.	7	10
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.	1	10

Computer Projects: 2	**$ 4,584,704**		**8**	**20**
Broadband Adoption Programs, Mapping and Technical Assistance Grants:				
Grantee	**Amount**	**Description**		
C.K. Blandin Foundation	$ 4,858,219	Blandin Foundation and partners will bring a network of resources and support to rural Minnesota individuals and communities - especially those unemployed and seeking employment, small businesses, coalitions of government entities, and local leaders.		
Northeast Services Cooperative	$ 200,000	The Northeast Service Cooperative proposes creating a broadband development plan to spark entrepreneurship and business opportunities in an eight county region in northeastern Minnesota. The project design is a three-pronged approach to 1) implement a market study to determine business, economic, and broadband needs; 2: develop an engineering design for a regional broadband network; and, 3) create a pro forma financial analysis of a proposed future loan.		
Mille Lacs Band of Ojibwe	$ 48,361	The Broadband Connectivity Plan will determine the exact need for broadband services in one of the most isolated, rural regions of northeast central Minnesota, specifically District III of the Mille Lacs reservation. Activities will include but are not limited to qualitative and quantitative market studies and engineer designs for laying fiber optic cable. The plan will be used to implement a connectivity project approximately 12 months after the planning phase has been initiated.		
Connect Minnesota (2 awards)	$ 4,461,171	Connect Minnesota will work with the Minnesota Department of Commerce to create mapping of broadband availability, staff to assist in broadband development and use surveys at the county and state level through 2014.		
Sustainability Projects: 5	**$ 9,567,751**	Table created with the assistance of Ann Treacey of the Blandin Foundation.		
Total BIP Dollars	**$ 192,630,829**			
Total BTOP Dollars	**$ 50,086,687**			
Total Stimulus Dollars	**$ 242,717,516**			

APPENDIX E – GLOSSARY

Bandwidth: Used in common parlance as a measure of the speed of a network connection. It is measured in Kbps (kilobits per second) or mbps (megabits per second). Typical modem speeds are 28.8 Kbps and 56 Kbps. Bandwidth should not be confused with latency, which refers to the amount of time it takes to transfer data from one point to another. Also see broadband and cable modem and DSL.

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.

Broadband is an advanced communications systems capable of providing high-speed transmissions of services such as voice, video, and data over the Internet and other networks. Transmission is provided by a wide range of technologies including digital subscriber line and fiber optic cable, coaxial cable, wireless technology and satellite. Capable of delivering voice, video, and data simultaneously at rates of 1.544 Mbps or higher.

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.

Fiber to the Premise (FTTP): is 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.

GIS data: A geographic information system (GIS), or geographical information system, is any system that captures, stores, analyzes, manages, and presents data that are linked to location.

DSL: An acronym for Digital Subscriber Line, a form of broadband network connection for the home. Also see cable modem.

High-speed broadband: A broadband Internet connection that transmits data such as e-mail and Web pages much faster than so-called "dial-up" services. The most common high-speed access services are DSL; cable modems; T-1 and T-3 lines; DBS; and fixed wireless.

HTTP: Hypertext Transfer Protocol. HTTP is the way HTML Web pages are transferred from the Web server to the Web browser.

Intercarrier Compensation (ICC): The compensation that providers of communications services pay to each other when the communication is handed off from one provider's network to another provider's network.

Internet2: is a not-for-profit advanced networking consortium comprising more than 200 U.S. universities in cooperation with 70 leading corporations, 45 government agencies, laboratories and other institutions of higher learning as well as over 50 international partner organizations.

Internet Protocol (IP): The method or protocol by which data is sent from one computer to another on the Internet.

ISP: Internet Service Provider. Makes an Internet connection available to customers. Some ISPs provide cable modem access, DSL access, and modem access. Also called an access provider.

Last mile: The final leg of a cable TV, telephone or other telecommunications network that ends in the user's household. The last mile can be a copper wire, fiber-optic line or a wireless link.

Metropolitan Library Service Agency (MELSA): an alliance of 103 public libraries in the seven-county Twin Cities metro area.

Megabits per second (Mbps): Mbps is used to measure data transfer speeds of high bandwidth connections, such as Ethernet and cable modems.

Middle mile: a broadband infrastructure project that does not predominately provide broadband service to end users or end-user devices, and may include interoffice transport, backhaul, internet connectivity, or special access.

Peering: Voluntary interconnection of administratively separate Internet networks for the purpose of exchanging traffic between the customers of each network.

Protocol: In computer terms, a formal and precise definition of what kind of information is transferred and how it is transferred between two or more parties. HTTP is an example of a protocol.

Server: A centralized repository of information or other resources. Clients send requests to a server. The most common example of a server is the Web server.

T-1: Technically refers a piece of hardware needed for a network connection, commonly used to refer to a type of Internet connection provided by telephone companies. T-1 lines transfer data at 1.5 megabits per second, and are typically leased by ISPs and by businesses.

T-3: A very high-speed network connection in which data is transmitted at a speed of 45 mbps.

Underserved population: A demographic measurement which describes those consumers who are unable to subscribe to an Internet service because of factors such as the absence of computer ownership, lack of training, income limitations, employment issues or other demonstrable need.

Underserved: we struggle with what this means. Is an area that only has 768k mobile really to be considered as having broadband? Especially broadband sufficient to run a business?

Universal Service Fund (USF): A federal fund under the FCC that keeps rates for local telephone service at reasonable levels especially in rural areas (high cost fund), that funds the E-rate program, that provides support for the Rural Healthcare Program, and that supports the federal Lifeline and Link-up programs for low income users.

Web server: A server that delivers Web pages upon request. Examples of Web servers include Apache and IIS.

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