Region 1 Broadband Investment Plan

Final October 13, 2011

Background

1) The Region 1 Broadband Planning Team met regularly between February and March 2011 to assess opportunities to improve the availability and adoption of affordable broadband services. The following plan was developed as a result of numerous meetings and final deliberation.

2) Broadband brings multiple benefits to the region. Specifically, better connectivity can:

- Support new business formation, telecommuting and job development;
- Reduce the need to travel long distances for medical care;
- Improve local access to education and training resources;
- Enable seniors to access information on-line;
- Speed response and improve coordination of emergency services;
- Facilitate marketing of the region to visitors; or
- Enable government to more efficiently deliver services to local residents.

3) These are among the list of many possible benefits of broadband. The Region 1 Team has decided to focus this Regional Broadband plan on expanding access to healthcare within communities presently less served by broadband or those not served at all. This priority responds to two realities that characterize the region. First, there are presently gaps in available broadband service, especially in parts of the Region with lower population density. Second, access to healthcare is an issue of particular importance to all communities within the region.

4) Emerging wireless technologies, in particular, offer promise as a means to extend affordable broadband service to those communities presently lacking adequate affordable broadband options. It is recognized however, that many factor affect the choice of appropriate technology in an area and wireline technologies can also be the most appropriate choice to fill gaps in some areas.

5) The cost of deploying both wireline and wireless technologies is impacted by the areas topography. Of particular note, Region 1 has extensive national and state forest-lands that are sparsely populated but attract 10 of thousands of visitors and recreationalists each year. For example, in Bayfield county, approximately 83% of the land is forested. This include 271,000 acres if National Forest and 167,500 acres of County Forest. There are over 1,000 of recreation trails throughout those forests.
These areas are particularly costly to deploy appropriate broadband connectivity. Yet at the

same time connectivity to these forested areas is particularly important for response to fires, accidents and other emergencies.

6) The Region 1 priority emphasizes the growing importance of healthcare to the region as well as emergency response. The ability to deliver healthcare information and services over high speed connections is not only important for hospitals and clinics, it is important to residents and businesses throughout the region who increasingly demand the ability to search for information and communicate with their chosen medical professional wherever he or she may be. The same capabilities, especially those available over mobile broadband are important for emergency response in the field. The ability to access both day-to-day and emergency health services is an important consideration of businesses in deciding where to locate or visitors and homeowners in how much time they will spend in the region. In short, the importance to the region is much greater than access to healthcare.

7) This document begins with a description of the regional need and opportunity, followed by an outline of a specific action initiative to expand the availability and use of broadband to improve healthcare access, and other purposes important to the region's communities.

Priority Need

1) Every County in the region has average percent of population older than 65 significantly greater than the statewide average of 13.3%. An older population expands the need for available healthcare.

2) Healthcare access is of course not only important for seniors and elders; it is a cornerstone of the area economy. Healthcare is the among the top 3 employers in 8 of the 9 counties in the region. Nearly 1,000 net new regional jobs are projected in healthcare by 2016. Beyond this direct contribution to the economy, available and affordable healthcare is critical to the region's tourism industry and more generally to the goal of retaining and attracting business to the area.

3) The availability of affordable broadband options is important to fulfill this current and growing need within all counties of the region for access to healthcare, as well as for related goals such as the ability for first responders to locate accident victims or transmit patient information from the field. Improved access to broadband for health and safety purposes also serves to advance other goals such as access to education, business opportunities, government information and so forth.

4) The LinkWISCONSIN broadband provider survey documents substantial broadband coverage is available in most of the region's communities. On average, approximately 95 % of the region's population live in a Census Block where a broadband provider advertises a service of 3 Mbps download speed or greater. However, many factors including terrain, lakes and others are a barrier to broadband service availability to individual homes and businesses, even in locations where it is generally available in the area. Gaps in available broadband service are reported to be particularly acute on Tribal lands within the region.

5) Even in locations where broadband service is available, it is not necessarily adopted.

6) The percentage of population adopting broadband in Region 1 (64%) is equal to the average for the state. Three Regions in the state have higher rates of broadband adoption. Two of those Regions have large urban centers (Milwaukee in Region 9 and Madison in Region 8). The rate of broadband adoption is impacted in part by demographic factors. In particular, the older population base in Region 1 reduces broadband demand. National research indicates that only about 50% of the people older than 55 adopt broadband service. This compared to an adoption rate of approximately 70 percent for people ages 25 to 44.

7) Income is also an important factor driving broadband demand. Median household income in Region 1 is just over $40,000 per year compared to over $52,000 per year for the state. Lower household income emphasizes not only the need for available broadband, but also affordable broadband.

Overview of Regional Opportunity

1) The following bullet points highlight several of the major reasons why utilizing broadband to expand healthcare access to the region is an important opportunity for Region 1:

- The modern healthcare system urgently needs more efficiency and patient access to services.
- Getting the patient (especially rural and elderly patients) to the medical professionals, or the medical professionals to the patient, is laden with issues and expense.
- In addition to emergency responders, there are home healthcare agencies, visiting nurses, case management specialists in the field (rural and metropolitan) who are limited to a verbal dialog, and handwritten notes. If they were able to connect through real time images with doctors, specialists, etc. (potentially at multiple locations), care and emergency response would be improved.
- If broadband were available, a caseworker in Cable WI could just as easily connect to an ophthalmologist in Miami or a heart specialist at the Mayo Clinic as she could to the patient's physician in Hayward or Superior WI.
- Technology already exists for three party virtual encounters, but higher speed connectivity is often required to take advantage of that technology.
- Earlier and more frequent encounters reduce overall healthcare costs (well documented) - particularly in elderly populations.
- Proactive and preventative care reduces healthcare costs (rather than letting medical issues get to the point of emergency room visits and hospitalizations).
- There likely will be new agencies created to perform virtual encounters (nursing assistants in the field with mobile devices to connect to physicians or specialists at hospitals to address medical needs wirelessly).
- Virtual encounters can be stored as a digital file and be linked to the electronic medical record most physicians and hospitals have adopted over the last 10 years and all are expected to adopt over the next several years.

- Wireless companies and hardware companies are looking for competitive advantages. Showcasing virtual medical encounters in rural areas could incent them to provide funding or resources to the effort.
- Several companies are perfecting HIPAA (medical privacy standard encryption) compliant virtual encounter technology in Duluth and Minneapolis. The Region could potentially partner with these companies for a prototype program.

2) To fully take advantage of these opportunities it will be necessary that current gaps in broadband service be eliminated and the existing deployed broadband be fully utilized for healthcare access. This includes addressing any current barriers to adoption such as affordability of service, access to computers, knowledge of how to use the Internet and others.

Connectivity for Area Medical Facilities Responding to LinkWISCONSIN survey

County	Facility	Technology	Max Speed
Ashland	Memorial Medical Center	Fiber	50 – 100 Mbps
Burnett	Burnett Medical Center	DSL	25 – 50 Mbps
Douglas	St. Mary's Hospital of Superior	DSL	25 – 50 Mbps
Price	Flambeau Hospital	DSL	25 – 50 Mbps
Sawyer	Hayward Area Memorial Hospital	DSL	6 – 10 Mbps
Taylor	Memorial Health Center	Fiber	50 – 100 Mbps
Washburn	Spooner Health System	DSL	25 – 50 Mbps
Washburn	Indian Medical Center/Shell Lake	DSL	6 – 10 Mbps

3) Among the eight Region 1 medical facilities responding to a LinkWISCONSIN site survey, all have some level of broadband connectivity. Two of the facilities have a fiber connection providing a very high speed 50 to 100 Mbps download and upload speed. Others have a DSL connection providing speeds in the range of 25 – 50 Mbps, which is adequate for most common telehealth and telemedicine applications. Two others have a slower DSL connection providing 6 – 10 Mbps, which is more limiting for some applications. Data for smaller medical centers and Tribal health centers in the region are not yet available.

4) The data on broadband connectivity to medical facilities that is available indicates most major medical facilities in the area do have a current level of broadband connectivity providing building blocks for expanded healthcare access into the surrounding region. For example, with comprehensive availability of wireless broadband service in the surrounding area:

- First emergency responders transmit patient data remotely from the scene of an accident to the emergency room prior to the patient's arrival saving critical time and saving lives.
- Similarly, wireless locator devices can be used to discover the location of a lost hunter or victim of a snowmobile accident.
- Alerts can be issued to cell phones warning both visitors and residents of weather or other related events impacting public health and safety.

5) By extending affordable broadband service to homes and businesses currently lacking service or improving the adoption of existing services:

- People can communicate personal patient data with their preferred doctor regardless of where he or she may be located.
- Patients can return home more quickly after surgery, as their vital signs can be monitored form home.
- Seniors can remain in their homes longer by using wireless broadband services to enable alerts in the case of a fall or other medical emergency.
- Medical professionals can live and enjoy their preferred lifestyle in Northwest Wisconsin but be connected to serve patients anywhere (for example interpreting medical images or medical consultation).

6) Benefits such as these extend beyond personal health to support the regional economy and sustainable communities.

7) Because Region 1 has much to build on in both existing infrastructure and leadership, it has an opportunity to demonstrate a comprehensive approach to improving healthcare access. This could include such things as:

- Supporting area hospitals as well as Tribal and other health centers in the region to better leverage existing broadband connections to expand telehealth and telemedicine applications.
- Demonstrating the use of broadband to comprehensively address public health and safety needs through enhanced application of wireless broadband solutions.
- Partnering with innovative broadband infrastructure projects addressing needs in underserved areas such as the wireless broadband network project proposed by the Lac Courte Oreilles, (LCO) Tribe.
- Leveraging infrastructure and knowledge employed to advance healthcare access to also improve access to education, government services, business opportunities and so forth.

Proposed Broadband Investment

Additional regional investment is needed for research, awareness programs and other strategic actions to comprehensively expand healthcare access within the region. The following table provides an overview of key planned investments:

Type of Investment	Activities	Responsibility
Leadership	· Establish commitment from appropriate leadership organization. · Solicit and manage regional partnerships. · Coordinate with UW Extension demonstration project in Superior. · Apply for and manage grants if needed. · On-going communication.	· Convening organization TBD. A regional leadership group will be convened and include representatives from healthcare, Tribal government, public safety, business, local government, broadband providers and others.
Research	· Assess broadband service available to healthcare facilities and map gaps. · Refine assessment of broadband service gaps to regional homes, businesses and recreation areas. · Identify existing related public health and safety initiatives seek collaboration where important to project goals	· LinkWISCONSIN/PSC will provide examples of survey questions and on-line tools to support research. · An appropriate higher education partner will be required to manage databases and support analysis. · Coordination where possible with other related regional initiatives.
Awareness programs	· Implement targeted education directed towards identified needs in area medical facilities as well as to homes and businesses	· Local leadership group will be convened to guide awareness outreach. · Partnership with area higher education initiatives where appropriate.

Targeted Demonstrations	· Support implementation of LCO Tribal wireless initiative · Partner with LCO Tribe and others within the region to demonstrate the innovative application of broadband to improve public health and safety.	· LCO Tribe · Regional leadership group to be convened. · Coordination infrastructure plans developed through UW Extension demonstration project.

Key Tasks and Timeline

Phase 1- Convene Area Leadership

Summer 2011 and ongoing

Task 1.1. A regional organization with appropriate mission and resources will be assigned the responsibility to convene a "regional leadership group" to guide the implementation of the plan. The leadership group will at a minimum include representation from healthcare, public safety, Tribal government, municipal and county government, business, education, broadband providers and others as appropriate. The leadership group will provide a focal point for exploring opportunities for public and private partnership engaging area broadband providers with appropriate community support and incentives to expand broadband service availability. Regional Organizations such as the Northwest Regional Planning Commission provide networks to encourage and facilitate needed regional collaboration. Other key networks such as hospital leadership and UW Extension can play a key role in bringing the right interests to the table.

Task 1.2. The regional leadership group will identify and secure resources as needed to successfully support plan implementation. The plan is designed to utilize volunteers and skills of existing organizations to the maximum extent possible. However, it is recognized that additional financial resources may be needed to pay for such things as a part-time staff person to manage the work of volunteers and oversee activities. To the extent paid staff is needed, it is preferred that he or she be located within an existing organization to minimize additional resource needs.

Task 1.3. The regional leadership group is expected to continue for a period of at least three years to oversee implementation of the planned project activities. This group will all ensure coordination with other related on-going initiatives in the region such as the UW Extension demonstration project in Superior.

Phase 2 – Research

Fall 2011 – Spring 2012

Task 2.1. LinkWISCONSIN will provide the region with an on-line survey tool that can be distributed to update data on broadband connectivity as well as current and desired uses of broadband available to area hospitals, tribal and other health centers as well as first responders. While most of these entities are expected to have current Internet access to complete an on-line survey, paper copy surveys will be distributed as needed to complete data collection. Regional volunteers to be identified by the leadership group will oversee the data collection using the survey tool provided. Particular emphasis will be given to defining connectivity to regional health clinics including those on Tribal lands.

Task 2.2. A similar tool will be provided to the leadership team to collect and map unmet residential and business demand for broadband. The surveys will be targeted specifically to areas of the region where broadband service is less available or not available at all. Existing local based organizations such as libraries; EDCs, Chambers of Commerce and others will be recruited to help publicize the online survey opportunity among residents and businesses with at least access to a dial-up connection. In addition, public sites such as at local libraries or local Tribal community centers will be advertised as available to collect broadband service needs for those lacking any Internet access at home or at their place of business. An appropriate education sector partner will be recruited to help organize and analyze consumer demand data that is collected through the surveys. The unmet demand will be mapped for the region using a tool to be provided by LinkWISCONSIN.

Task 2.3. An appropriate partner within the region will be engaged to facilitate town hall meetings specifically inviting representatives from the area healthcare and public safety community as well as others to review data collected through survey and to refine a statement of what is needed to use broadband to improve public access to health and safety resources. Special attention will be given at town hall meetings to identify related health and safety initiatives for which coordination is important to the region's success. This will include outreach to regional networks such as 911 administrators, fire, law enforcement an emergency medical providers as well as hospital and clinical directors.

Phase 3—Implement Awareness Programs

Spring-Fall 2012

Task 3.1. The regional leadership group will engage others as needed to identify realistic opportunities to address needs and challenges discovered through the research phase. This may include for example:

- Funding and technical assistance programs to help healthcare providers expand telehealth or telemedicine applications.
- Workforce training programs that support healthcare professionals better integrate information services into delivery.
- Opportunities for regional collaboration to improve telehealth and telemedicine applications.
- Healthcare information and software tools that can improve the ability of area residents to access healthcare services at home.

- Programs and technical support available to help business expand use of available broadband to reduce healthcare costs.
- Opportunities to improve the effectiveness of public safety and emergency response through adoption of mobile broadband applications.
- Information on existing broadband services available within the region.
- General awareness among the public regarding the benefits of broadband.

Task 3.2. The awareness-building phase will emphasize leveraging already funded existing initiatives rather than the funding of new initiatives. Where possible, partnerships will be forged with universities, technical colleges, non-profit organizations, state government and other organizations with resources to help with identified regional needs. These resources will be inventoried and where possible matched with identified business needs within the region. In addition, with the assistance of the Wisconsin PSC, Region 1 will reach out to other areas of Wisconsin working on similar issues to explore synergies and opportunities to work together to implement solutions.

Task 3.3. Once responsive initiatives are identified, a systematic program can be implemented to expand awareness of available resources to help healthcare providers, emergency response personnel as well as residents and businesses to leverage broadband services to improve healthcare access and emergency response. This may include outreach to expand awareness of existing broadband service options available in the region as well as options for those that may not have any affordable broadband service option available in areas where broadband adoption is limited.

Task 3.4. The benefits of better adoption and availability of broadband are not limited to healthcare. Awareness programs to be implemented through this initiative will include general community information on how broadband can improve access to education, business opportunities, government information, energy management and benefits. The LinkWISCONSIN/PSCW team will give the region access tools for general audience education.

Phase 4: Wireless Broadband Demonstration

Fall 2011 and beyond

Task 4.1. An infrastructure project is proposed to address the lack of access to areas representing the bulk of tribal lands, which includes tourism areas. The distance between homes and low density of subscribers dictates a WiMax (802.11n) wireless solution that will serve the LCO tribal members, as well as all other interested home owners that live within the boundaries of the LCO reservation and mobile customers who are visitors to the reservation. The planned wireless base station(s) will support indoor and outdoor access points for fixed subscribers, providing broadband Internet, telephone and video based entertainment service as well as multi-protocol mobile service compatible with networks of major national carriers. The initiative will be led by the LCO Tribe. The regional leadership group formed as a part of this project will play a supportive role as appropriate.

Task 4.2. A project will be implemented in partnership with the LCO tribe to demonstrate how a combination of fixed wireline broadband connections to local medical clinics and wireless service to the surrounding area can be utilized to comprehensively improve healthcare access as well as emergency response.

Task 4.3. Other regional demonstrations will be identified and implemented depending on interest and resources available.

Budget

Infrastructure Funding: This project emphasizes leveraging existing deployed infrastructure. However, infrastructure funding will be sought as a part of LCO wireless initiative. Additional funded infrastructure needs will be determined over the course of the project.

Equipment and Supplies: No major equipment or supply anticipated for this project.

Paid Staff: An optional half-time paid professional is suggested to ensure project tasks are well organized, volunteers are coordinated, grant applications are submitted as needed, communication with all stakeholders are clear and consistent. This position could be contributed in-kind by an existing organization or funded as a new position subject to available funding.

Contributed in-kind staff: TBD
Funded Paid Staff: TBD

Volunteer Time: Given limited resources, most of the key tasks are expected to be accomplished by regional volunteers.

Number of volunteer hours: TBD
Value of volunteer hours: TBD

Other Investment: TBD

Anticipated Impacts & Three-Year Objectives

The proposed broadband investments are anticipated to result in several important positive outcomes and impacts for the region including but not limited to:

- Expanded community and business awareness of broadband benefits including such things as business development, access to government services, energy management and others.
- New broadband availability in unserved tribal areas.
- Increased utilization of broadband for telehealth and telemedicine applications by area medical facilities.
- Expanded access to health information and health services within area homes and businesses.

- Improved ability of emergency responders to communicate from the field to area hospitals and others that need to be informed in the case of an emergency.
- Reduction in broadband service gaps in low-density areas.
- Higher broadband adoption rates throughout the region.
- Demonstration of the innovative application of the comprehensive use of both available wireline and wireless technologies to improve area access to healthcare and emergency response.

Three-Year Objectives:

The following PRELIMINARY objectives are targeted for Region 1 by 2014:

- At least 50% of regional hospitals, tribal and other clinics will expand telehealth or telemedicine applications.
- The LCO Tribe will successfully obtain funding and implement its proposed broadband wireless proposal.
- At least 20% of households and 20% of businesses in a selected demonstration area utilize a broadband service to access healthcare information or services on the premises.
- At least one project will be implemented in the region resulting in an expanded ability of emergency first responders to utilize mobile broadband to communicate with hospitals and others from the field.
- The overall broadband adoption rate for the region will improve by at least 5 %.

NOTE: These target objectives may be modified after completion of a baseline research.Placeholder

Monitoring and Evaluation

1) Subject to available funding, the LinkWISCONSIN/Public Service Commission Team will support Region 1 design and implement a comprehensive monitoring and evaluation effort. The monitoring process will focus initially on collecting data on inputs, activities and processes. The evaluation process focuses on outputs, outcomes and impacts.

Inputs → Activities → Processes → Outputs → Outcomes → Impact

2) Examples of inputs include such things as number of volunteer hours, hours of paid staff time, number of local partners engaged or time spent in planning meetings. Activities and Processes are such things as progress towards completing a comprehensive database on residential broadband demands, development of a memorandum of understanding with local university campus to help with survey research, formation of local task groups, collection of baseline data on business broadband access and adoption, and so forth. The LinkWISCONSIN/PSC Team will create on-line tools to support this necessary data collection.

3) The evaluation process will focus initially on outputs and outcomes defined by the above objectives. For example identifying expanded awareness of broadband opportunities among

rural business owners, or assessing additional broadband connections needed at area medical clinics as well as the uses of those connections. Impact data will go beyond outputs and outcomes to determine such things as the economic impact of new rural business formation; energy savings and household savings from reduced commuting, tax base improvements from new rural business development, etc.

4) Subject to available funding, a detailed monitoring and evaluation plan will be designed and implemented early in 2012.

Sustainability Plan

1) Success in attracting the targeted broadband investments will depend significantly on an upfront project design that assures the initiative will be sustainable into the future. This sustainability will be achieved through the strategic engagement and leveraging of existing organized efforts in the region that include but are not limited to:

Integration of this priority broadband investment initiative within the context of existing planning and economic development initiatives.

- Collaboration with the UW Extension Broadband Demonstration Project in Superior.
- Engagement and partnership with area broadband service providers.
- Strong partnerships with area County-level economic development corporations and business associations.
- Strong partnerships with area Regional Planning Commissions.
- Outreach and engagement to appropriate state government entities and legislative audiences.

2) In short, the strength and sustainability of the project to expand broadband investment targeted to rural businesses will depend on the effective partnership of multiple existing organizations. The goal is to minimize the need to obtain funding for new operational revenues and contracts. Similarly, to the extent current broadband gaps can be filled through helping to build a business case for existing providers to extend service to fill those gaps rather than the need to find grant or load resources for infrastructure, the chances of success will be enhanced.

3) It is recognized however that volunteer leadership in the region is stretched. Sustainability will be enhanced by successful efforts to obtain funding for at least a half-time paid staff position within an existing organization to provide the on-going leadership and organization to manage these important partnerships.

Appendix A: Regional Description

Counties and Communities

Nine Counties including Ashland, Bayfield, Burnett, Douglas, Iron, Price, Sawyer, Taylor, Washburn make up the Northwest Broadband Planning Region. The Northwest Region

includes dozens of smaller communities, with the vast majority smaller than 2,000 in population. Only Superior in Douglas County has a population base larger than 25,000 people.

Population

The Northwest is among the most rural in the state with an average population density of only 14.6 people per square mile compared to an average of 86.3 people per square mile for the state as a whole. Population density in the region is reduced by the reality of hundreds of thousands of acres of forestland. Douglas County is the largest population center for the region with an estimated 44,274 people in 2009. The smallest County in the region is Iron, with an estimated 2009 population of approximately 6,000 people.

Five of the nine counties in the region have experienced population decline over the past decade, with the largest declines in the eastern and northern boundaries of the region. Population declined 11.4% in Iron County between 2000 and 2009 and just over 10% in Price County during this time period. Other Counties experiencing population loss over the past decade are Ashland (-4.1%), Taylor (-2.3%), and Bayfield (-1.5%). The largest population growth between 2000 and 2009 occurred in Sawyer (4.6%) and Washburn (3.9%).

Demography

The population in the Northwest Region on average is substantially older than the average for the Wisconsin. Based on 2008 Census of Population estimates, 19.1% of the Northwest Region's population are older than 65 compared to 13.3% for the state as a whole. Iron, Burnett and Washburn Counties have the highest proportion of senior citizens with 24.1%, 22.7% and 21.1% of the population older than 65 in 2008. Douglas County has the lowest proportion in this demographic group with 14.4% of the population older than 65.

The demographics of the region are also distinguished by a relatively high percentage of American Indians. 5.2% of the region's population are American Indians compared to a 1% average for the state’s population overall. The largest concentration of American Indians is in Sawyer, Ashland and Bayfield Counties with 16.2%, 11% and 10 percent of the population respectively.

Consistent with the overall trends of the state, a higher proportion of the population of the Northwest Region has graduated from High School compared to the nation. In the Northwest, 83.6% of persons over the age of 25 have a High School diploma or higher. This compares with 85.1% for the state and 80.4% for the nation. However, the proportion of the population graduating from a four-year degree program is lower, just over 15% of the Northwest population older than 25 have a Bachelor's degree or higher. This compares with 22.4% for the state and 24.4% for the nation. In fact, all nine counties in the region have a lower proportion of the population over 25 with a Bachelor's degree than the state average.

Median Household Income

On average, 2007 income levels for persons living in the Northwest are lower than the state average, $27,907 per capita versus $36,272 per capita. Per capita income in all nine counties is substantially below the state average, with only Sawyer County having an estimated 2007 per capita income in excess of $30,000. 2008 estimated poverty rates are also higher with 13.1% of the Northwest Region's population living below the poverty line compared to 11% for the state.

Appendix B: Regional Economy

Regional Economy

The U.S. Bureau of Labor Statistics organizes data into ten sectors reflected key economic drivers in the modern economy. March 2010 employment in each of these sectors for the Northwest Wisconsin Region is depicted in the following table.

2010 Region 1 Employment by Major Sector

Economic Sector	Q1 2010 Regional Employment	Employment Change 2007 - 2010	Sector % of Regional Total (2010)	Sector % of State Total (2010)
Natural Resource and Mining	626	-121	1.1%	0.8%
Construction	1,743	-1,424	3.0%	3.2%
Manufacturing	8,801	-1,873	15.3%	16.3%
Trade/Transportation & Utilities	11,675	-1,096	20.4%	19.0%
Information Services	458	-49	0.8%	1.8%
Financial Activities	1,885	-290	3.3%	5.9%
Professional/Business Services	3,127	69	5.5%	10.0%
Educ./Health Services	7,594	110	13.2%	15.0%
Leisure & Hospitality	6,289	-1,436	11.0%	9.0%
Government	13,757	780	24.0%	15.4%
Other Services	1,290	-255	2.3%	3.2%
Regional Total	57,385	-5,592	100%	100%

Source: US Bureau of Labor and Statistics, 2007 - 2011

Over 57, 385 people were employed in Region 1 during the first quarter of 2010. Approximately one-quarter of the Region 1 workforce is employed within local, state or federal government (13,757 people). Trade, transportation and utilities businesses employed an additional 11,675 people the first quarter of 2010. Other major employing sectors are Manufacturing, education, health leisure and recreational businesses.

Region 1 lost 5,592 jobs between 2007 and the first quarter of 2010. Losses were spread fairly evenly among construction (-1,424), trade, transportation and utilities (-1,096), manufacturing (-1,873) and hospitality (-1,436).

Employment Projections

The Wisconsin Department of Workforce Development models projected non-farm employment growth by industry for each of the state's eleven workforce development regions. The Northwest Region is a part of the Northwest Workforce Development Region including Ashland, Bayfield, Burnett, Douglas, Iron, Price, Rusk, Sawyer, Taylor, and Washburn Counties, Rusk is the only county not part of the broadband planning region.

In general, the projected future growth prospects for Region 1 are positive for most of the economic drivers in the region. Education and Health Services in particular are expected to add significant jobs over a ten year study period beginning in 2006 and ending in 2016. Notably the Information/Prof. Services/Other Services Sector is expected to continue to also add net jobs over this period. The national and statewide trend of declining manufacturing employment is project to continue to adversely impact Northwest Region employment. Between 2006 and 2016, manufacturing employment is projected to decline -1.2% for the Northwest Region of that food manufacturing is expected to decline -10.3%.

Workforce Trends

The following occupational categories are projected to result in the ten largest net job growth between 2006 and 2016 within the Northwest Workforce Development Region of which the Northwest Broadband Planning Region is a part.

- Management Occupations 60 net new jobs
- Business and Financial Operations Occupations 230 net new jobs
- Computer and Mathematical Occupations 80 net new jobs
- Architecture and Engineering Occupations 40 net new jobs
- Life, Physical, and Social Science Occupations 30 net new jobs
- Community and Social Services Occupations 250 net new jobs
- Legal Occupations 20 net new jobs
- Education, Training, and Library Occupations 300 net new jobs
- Arts, Design, Entertainment, Sports, and Media Occupations 50 net new jobs
- Healthcare Practitioners and Technical Occupation 580 net new jobs
- Healthcare Support Occupations 380 net new jobs
- Protective Service Occupations 110 net new jobs
- Food Preparation and Serving Related Occupations 720 net new jobs

- Building and Grounds Cleaning and Maintenance Occupations 260 net new jobs
- Personal Care and Service Occupations 400 net new jobs
- Sales and Related Occupations 150 net new jobs
- Office and Administrative Support Occupations 290 net new jobs
- Farming, Fishing, and Forestry Occupations -10
- Construction and Extraction Occupations 250 net new jobs
- Installation, Maintenance, and Repair Occupations 140 net new jobs
- Production Occupations 60 net new jobs
- Transportation and Material Moving Occupations 50 net new jobs

These projects emphasize job growth is projected to grow across a wide spectrum of occupational skill categories, but with a particular emphasis in health and education related fields. Some fields such as Health Care Practitioners, Registered Nurses or Business & Financial Occupations will require workers with higher levels of education. Others such as building and grounds maintenance and food preparation and serving occupations may require less formal post high school education.

Overall the occupational and industry trends framing economic development in the Northwest Region point to the need for effective education and training networks including the continued leveraging of distance delivery technologies supporting access at home and at places of work.

Appendix C: Broadband Availability

Gaps in Broadband Service

Wireline Broadband Service Coverage in Region 1 Area

A review of the LinkWISCONSIN interactive broadband map (http://wi.linkamericadata.org/) highlights significant gaps in broadband service throughout all Counties in the Northwest Wisconsin. At a high level, broadband availability follows higher population density where there is a larger customer base and the average cost of deployment is less (because there are more customers to spread the fixed costs). In more isolated areas it is less likely that there will be a wireline broadband service provider, however, increasingly wireless broadband options are emerging.

Population density alone does not fully explain gaps in broadband availability. Other factors such as demographics of an area (demand drivers), land use patterns, economic growth potential, university proximity, physical land features, provider access to federal universal service funds and simply local leadership can also play important roles in availability

Notable Service Differences

Defining “broadband” is not simple, and many different definitions exist. The Federal Communications Commission (FCC) defines broadband in terms of data transmission speed. The FCC definitions include several ranges, with the minimum tier of “broadband”

services starting at a speed of 768 Kilobits per second (Kbps) for data traveling from the Internet to your computer (downloading.) and at least 200 Kbps for data from your computer to the Internet (upload.) For purposes of this project, the FCC definition is a minimum standard to define a “broadband provider”. However, the ultimate minimum “broadband capability” for any given customer or market segment must be defined by the services for which broadband is being used. Services which are totally adequate for some purposes (e.g. uploading YouTube videos) will not support others (e.g. tele-radiology.) With greater speeds, there is greater capability.

Existing technologies have various technical limitations on the speeds that they can provide. Mixed fiber / twisted pair copper services, as typically deployed by traditional telephone companies as well as fixed wireless broadband services range from 1.5-25 Mbps or more. Fiber-to-the-home services are generally faster, while mobile wireless technology is generally slower. Defining services by technology does not tie directly to services, but it is useful in identifying what services are available, and where.

Regional Differences in Broadband Service

The tables appearing below illustrate the disparity of broadband access across the Region:

	Percent Population in Census Blocks With Advertised Maximum Download Speeds Available At:				
County	≥ 10 Mbps	3 to 10 Mbps	< 3 Mbps	Mobile Option Only	No Option Greater than 768 kbps.
Ashland	72.4	20.7	5.9	1.5	0.5
Bayfield	40.2	53.0	6.7	1.1	0.1
Burnett	27.9	65.2	7.0	0.7	0.0
Douglas	84.5	8.5	7.0	0.2	0.0
Iron	79.7	6.5	12.2	1.5	1.6
Price	75.4	13.7	10.7	0.0	0.2
Sawyer	71.6	22.4	4.5	0.8	1.6
Taylor	48.4	27.6	22.7	16.7	1.3
Washburn	70.9	`6.4	12.8	2.3	0.0

Source: LinkWISCONSIN Broadband Provider Survey, Q1 2011

All nine Counties in Region 1 have significant areas with higher speed broadband service (in excess of 10 Mbps) and areas with broadband service availability below 3 Mbps or no broadband service at all. In part as a result of terrain, mobile availability is less than some

other parts of the state. An exception is in Taylor County where 16.7 percent of the population live in a Census Block where mobile is the only broadband service available.

Washburn, Taylor, Price and Iron Counties have the largest percentage of the population living in Census Blocks with less than 3 Mbps as the maximum available speed advertised. Douglas County has the largest percentage of population living in Census Blocks where there is service providing an advertised download speed in excess of 10 Mbps.

To interpret the above table, it is important to emphasize a couple of qualifications. First the data reflect the maximum advertised broadband speed of service available in a Census Block. Not everyone in a given Census Block necessarily has access. Especially in rural areas, the geographic size of a Census Block is often substantial and there will be service differences locally. Also the data reflects the maximum download speed advertised in each area. For an individual customer, the actual speeds can vary depending on location. With these qualifications in mind, the data does provide a picture of differences in broadband service across the region.Placeholder

Appendix D: Broadband Adoption

Percentage of Subscribers

The US Department of Commerce NTIA conducted a national consumer broadband adoption survey in October of 2010. The findings are summarized in its February 2011 Digital Nation report. National broadband adoption data reported by NTIA indicate that Wisconsin ranks 22nd in the country in broadband adoption, with an estimated 70.5% the state's residents accessing the Internet using broadband in 2010. A statewide consumer survey conducted by LinkWISCONSIN in 2010 found a somewhat lower, but still very substantial rate of broadband subscription of 64% for the state.

The LinkWISCONSIN survey also compared the rate of broadband and Internet adoption across different regions of the state. Broadband adoption in Region 1 matches the state average at 64%%.

Barriers to Adoption

One factor impacting adoption in Region 1 is availability of broadband supply as noted in Appendix C. There remain substantial gaps in broadband availability, especially in less populated areas of the Region.

There are a number of reasons in addition to availability that are barriers to adoption.

Among people living in Region 1 who do not presently use the Internet, the most frequently cited reason is they do not have a computer and the second most frequently cited reason is affordability.

Impact of Demographics

Recognizing these typical barriers to accessing the Internet with any technology, it is not surprising that the demographic make-up of an area is closely associated with the rate of Broadband Adoption. For example in areas with lower median income, people are less able to afford to pay for a computer and broadband subscription. Specific data is not yet available for Wisconsins, but the following table from the recent NTIA Digital Nation report illustrates the strong relationship between income and Broadband Adoption.

Persons using Broadband at home by family income

Educational attainment is associated with both consumer purchasing power and perceived value of Broadband. Adults with at least a Bachelor's degree are nearly three times as likely to use Broadband than adults lacking a High
School diploma.

Persons using Broadband at home by education

Finally, age is an intuitive and real variable that impacts perceived value of the Internet. Also seniors are more likely to live on a fixed income impacting affordability. While perceived value is changing, as more older people recognize the Internet as a valuable tool to access health information, stay in touch with family, avoid trips out of the house in poor weather and so forth, still age matters in Broadband Adoption.

Persons using broadband at home by age

These driving demographic forces help to explain why Broadband adoption is lower in Region 1 compared to other parts of the state (See demographics in Appendix A).

How people access the Internet

Broadband adoption is also impact by people access to devices used to access the Internet.

A lack of computer at home is one of the most significant reasons cited for not using the Internet. Nearly three-quarters of people responding to the LinkWISCONSIN consumer survey access the Internet with a home computer. Computers at work or at school are also an important means of access. Presently mobile devices are not as widely utilized for Internet access, but looking to the future mobile access is projected to be much more important. As the capabilities of mobile technologies continue to improve, there are more customers that rely on air cards, smart phones and other Internet enabled mobile devices as their primary connection to the Internet. According the Cisco Global Visual Data Mobile Data Forecast, more than 400 million of the world's Internet users could access the network solely through a mobile connection by 2014.