

# Region 2 Broadband Investment Plan

Final - December 12, 2011

## Background

[1] The Region 2 Broadband Planning Team met regularly between November 2010 and December 2011 to assess needs that can be advanced by more available and more widely utilized broadband services.

[2] Emerging from these discussions is a recognition that broadband access and utilization is among the most significant factors that will determine the region's opportunity for economic growth and improving quality of life. Broadband makes it more possible for business owners to expand into new markets, workers to telecommute from home and for residents of all ages to access the training and education needed to be successful in the 21st Century economy

[3] For communities throughout the region, better connectivity supports an improved quality of life as it can:

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

[4] This broadband investment plan is intended to provide a path forward to expand broadband availability and adoption. The plan recognizes that improved quality of life in area communities and making it easier to operate a business or telecommute will benefit all residents of the North Central Region. It will also make it more possible for people living in the region only part-time to move to the region permanently. Even if they do not move to the region, some may find it more feasible to start local businesses or move part of an existing business to North Central Wisconsin. Broadband opens new possibilities both for existing residents and those who others who can bring new business opportunities and jobs to the region.

## Priority Need

[1] Looking to the future, there is a need to create a competitive environment in the region consistent with the growth of quality job opportunities including business growth to strengthen the areas tax base important to sustainable communities. As already noted,

broadband is a core infrastructure that can improve the quality of life in North Central Wisconsin's communities, strengthen business profitability, make it easier to start a new business and enable more job opportunities through telecommuting. More available broadband is not a "cure-all" for the economic challenges facing the region, but it is a very important component of the solution.

[2] The most recent (December 2010) Wisconsin Department of Workforce Development statistics indicate counties in North Central Wisconsin have among the highest unemployment rates in the state. Among all Wisconsin Counties, Vilas County is the second highest with an unemployment rate of 11.0 %. Reported unemployment rates in Lincoln, Forest and Oneida Counties are approximately 9.5% and 8.7% in Langlade County.

[3] The reasons for high unemployment are varied. Manufacturing has historically been a major economic driver for the state and the region. Overall, in 2010 manufacturing represented approximately 13% of the region's employment compared to about a 16% share for the state as a whole. In Lincoln County, a 23.3% of total employment is attributable to the manufacturing sector. Manufacturing in Langlade County represents 19.0%. Unfortunately, looking to the future, manufacturing jobs are expected to generally decline. Areas of expected employment growth opportunity include health care, education, and selected service related businesses. Many, but not all of these jobs pay lower wages and may be more seasonal in nature than manufacturing.

[4] The Applied Population Laboratory (APL) in the Department of Community and Environmental Sociology at UW- Madison, at the request of the Wisconsin Department of Natural Resources (WDNR) Parks and Recreation Program, released its "Regional Profile: Region 2" report in July 2010 in which it concluded, "In sum, the economy in Region 2 is continuing to transition from a production-based economy toward a service economy, and employment in the region's major industries (especially the ones with higher pay) has been declining. This is an area of the state where it can be difficult to find a good job and the current economic recession may impact this area to a greater extent than some other areas within the state of Wisconsin."

## Overview of Regional Opportunity

[1] According to the US Census, approximately 40 percent of homes in the five County Grow North Region are vacant for at least part of the year. The owners of these seasonal homes as well as visitors to the region represent a resource that can be strategically leveraged to enhance and strengthen the area's economic development. Specifically many of these individuals bring to the region wealth, business experience, entrepreneurial energy and contracts essential to regional economic development. Ensuring adequate affordable broadband access is available to seasonal homes, together with targeted initiatives to enhance the adoption and use of broadband, is a powerful means to leverage this existing asset and encourage new economic growth and job opportunities for all within the region.

The following are examples of how the wider adoption of broadband services can directly benefit the regional economy:

- The better ability to telecommute or operate a business from home will encourage seasonal residents to spend more days in the region and help create job and business opportunities for everyone in the five County Grow North Region.
- Broadband makes it possible for existing and new businesses to connect to distant markets, business partners and workers.
- Broadband helps overcome problems of isolation by enabling convenient local access to critical services such as health care, education, entertainment and public safety. This in turn improves quality of life for all North Central Wisconsin residents and encourages more part-time residents to move to the region year-around.
- Rural communities are more sustainable as more **part-time or seasonal** home-owners choose to live year-around in the region contributing to local business sales, expanding the local tax base, volunteering for local service organizations and filling empty seats in local schools.

[2] In short, a targeted initiative to ensure adequate affordable broadband connections extend to areas with seasonally vacant homes together with an initiative to encourage the strategic use of those broadband connections has a multiplier benefit for the entire region. The result is new jobs for area residents, more business opportunities for local companies, and a stonger tax base to support schools and other community needs.

## Proposed Broadband Investment

[1] Additional regional investment is needed for leadership, research, awareness programs and other strategic actions to expand broadband access and use among seasonal residents, resulting in new jobs, business oportunities and strengthened community vitality benefiting everyone in the region.

[2] The following table provides an overview of key planned investments:

Type of Investment	Activities	Responsibility
Leadership	<ul style="list-style-type: none"> <li>• Establish commitment from appropriate leadership organization.</li> <li>• Solicit and manage regional partnerships.</li> <li>• Apply for and manage grants if needed.</li> <li>• On-going communication.</li> </ul>	Grow North in collaboration with local EDCs, regional planning commissions, local governments, medical networks, libraries, education, area businesses broadband service providers and others.

Type of Investment	Activities	Responsibility
Research	<ul style="list-style-type: none"> <li>• Create regional database of seasonal home owners and their contact information.</li> <li>• Conduct survey of seasonal home owners to assess: <ul style="list-style-type: none"> <li>○ Current broadband access</li> <li>○ Barriers to adopting broadband.</li> <li>○ Business development interest and barriers.</li> <li>○ Needs such as access to health care, education, cultural and other.</li> <li>○ Barriers to living full-time in region.</li> </ul> </li> <li>• Assess broadband gaps in areas with seasonal homes.</li> </ul>	<p>Data and survey support from Nicolet Area Technical College and other university and college partners.</p> <p>Technical expertise from LinkWISCONSIN/PSCW</p> <p>Community awareness and survey targeting help from local governments, Tribes, regional planning councils, utilities, business organizations, libraries and others</p>
Awareness Programs	<ul style="list-style-type: none"> <li>• Implement targeted education directed towards identified needs.</li> <li>• Match regional resources (such as business training programs, computer literacy training, health care programs, etc.) with needs.</li> </ul>	<p>Educational outreach from area universities and colleges, libraries and partner organizations.</p> <p>Coordination from Grow North, local governments, local economic development organizations and other partners organizations.</p> <p>Subject matter support from LinkWISCONSIN/PSC</p>
Address Broadband Service Gaps	<ul style="list-style-type: none"> <li>• Engage providers to find solutions to fill critical broadband service gaps.</li> <li>• Apply for broadband infrastructure grants if appropriate.</li> </ul>	<p>Coordination from Grow North, local governments, local economic development organizations and other partner organizations.</p> <p>Technical expertise from participating broadband providers.</p>

## Key Tasks and Timeline

## **Phase 1: Detailed Needs Assessment and Strategy Refinement**

Spring through Summer 2011

### Task 1.1

Grow North will work through its regional Committee to contact appropriate officials in each of the five counties to determine the most efficient approach to identify and build a database of seasonal home owners. For example, county tax records are public records and available on DVD for a small fee. Residential property tax records may be sorted to identify homeowners with mailing addresses outside the county. Other options will be reviewed with the most efficient chosen. A regional database with contact information for identified seasonal home-owners will be assembled. Local utilities such as Wisconsin Public Service will be contacted for assistance in identifying owners of seasonally vacant homes and facilitating awareness of the on-going research. Area colleges and universities will be approached regarding possible assistance in organizing the database.

### Task 1.2

A short survey will be drafted to assess current broadband connectivity as well as current and desired uses of broadband by seasonal residents. For example the survey may consider issues such as:

- Awareness of broadband service benefits;
- Opportunities to support home-based business development or working from home while in the region;
- Issues that prevent living in the area year around such as lack of employment opportunities, access to health services, access to education, etc.; or
- Barriers to adopting broadband service ( such as affordability, confidence using technology, perceived value, etc.).

The Wisconsin PSC and LinkWisconsin staff can also provide expertise regarding survey question examples and potentially on-line tools to support the survey distribution.

### Task 1.3

The survey will be distributed to owners of seasonally vacant homes using two approaches. Where e-mail contact information is available, an on-line version of the survey will be distributed to second home-owners. For those home-owners without an e-mail address, surveys will be mailed or else distributed door to door by volunteers. Where possible, local economic development and civic organizations within the region will be engaged to help in both getting the word out and distributing surveys to area second homeowners.

### Task 1.4

Information collected through the survey will be organized into an appropriate database with information tabulated. Area colleges and universities will be approached to explore use of student and faculty resources to receive survey results, organize data bases and prepare an analysis.

#### Task 1.5

The physical locations of seasonal homes are to be organized by census blocks. The provider-supplied data collected by LinkWISCONSIN will be analyzed to assess current broadband connectivity in proximity to part-time or seasonal homeowners. Dependent upon available resources, the location of seasonal homes relative to available broadband service will be mapped. A three-tiered approach will be used to identify areas of geographic concentration for seasonal homes. The first tier, or "hot spots", are where activity is most likely to move forward quickly. The second and third tiers are areas of less density but containing a high probability for expansion. These other two tiers will complement and build upon identified "hot spots".

### **Phase 2: Implement Awareness Programs**

Fall 2011 through Summer 2012

#### Task 2.1

The results of surveys implemented in Phase 1 will be analyzed to identify opportunities to encourage more people to live in the region year-round contributing to the local economy through telecommuting or starting businesses. Specific opportunities **and geographic areas** with the greatest promise of success will be highlighted for initial focus.

#### Task 2.2

A regional task force will identify initial target projects that advance regional opportunities with promise for early success. For example, assistance could be provided to help people understand how to start and run a home-based e-commerce business. Regional health care entities could be encouraged to implement home health monitoring programs providing more security to residents who may need such assistance. Regional educational institutions could consider expanding home delivery of education responsive to the needs of seasonal home owners. There could be general training programs that increase awareness of everyone in the region regarding opportunities to access desired information on-line.

#### Task 2.3

Once responsive initiatives are identified, a systematic program can be implemented to expand awareness of those initiatives throughout the region. This could include, for example, the development of a targeted web-site, social media and other outreach with information addressing needs of visitors and second home-owners in the region.

### **Phase 3: Address Broadband Service Gaps**

Spring through Summer, 2012

#### Task 3.1

Form service gap teams including but not limited to local providers representing multiple technologies to review identified broadband service gaps to areas with seasonal homes.

#### Task 3.2

Review available data including provider reported availability, demographic data, results from seasonal home-owner survey and other information to prioritize unserved areas for potential expansion of broadband service. Assess options and solutions. Focus priority on areas where a business case for at least one provider for expansion can be identified.

#### Task 3.3

Organize regional support for provider, municipal or other organizational loan/grant applications as may be needed to advance solutions to broadband gaps in areas with seasonal homes.

## Budget

### **Infrastructure Funding**

TBD in 2012 after careful research

### **Equipment and Supplies**

No major equipment or supply expenses are anticipated as needed for this project

### **Paid Staff**

Initially the project will be managed through volunteer teime. A half-time paid professional is desirable by 2012 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

Several technical tasks may require specialized skills that could be contributed or may depend upon fund raising or a grant application. These include survey design and analysis and potential mapping of seasonal homes and available infrastructure. A potential source for these needed skills are local technical colleges and university campuses. Subject to continued funding of the LinkWISCONSIN initiative, technical support for survey design and research tasks may be available from the PSC and LinkWISCONSIN team.

# Anticipated Impacts & Three-Year Objectives

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

- Increased local retail sales resulting from a higher number of year-around residents.
- Expanded local tax base as a result of new homeowners and taxpayers coming into the region.
- Job opportunities through means such as telecommuting will be more accessible.
- Increased rate of entrepreneurial business formation led by people moving full-time to the region.
- Permanent occupancy will increase, resulting in construction of affordable new homes and rental units.
- School occupancy will increase as families with school-aged children migrate into the area.
- Improved access to vital basic services such as health care, government, and financial services.

[2] The following objectives are targeted for the five county “Grow North” region by 2014:

- Ninety five percent of homes will have access to a broadband connection of 1.5 Mbps download or greater.
- The percentage of year-round homes recorded on area tax roles will increase by at least 10 percent.
- The average length of stay in the region for seasonal residents including second-home owners will increase by 25 percent.
- At least 25 new businesses will be formed within the region by people migrating to the region from other areas.
- At least 50 percent of seasonal residents will report using broadband to access health care, educational content and/or financial information.

- The number of seasonal residents telecommuting part-time from homes in the region will increase by 20 percent.
- School occupancy will increase by 10 percent with more families living in the region year-around.
- Regional County unemployment rankings relative to other counties in the state will improve by at least five places, compared to December 2011 rankings, for all Counties in the region.

## Monitoring and Evaluation

[1] Subject to available funding, the LinkWISCONSIN/Public Service Commission Team will help Region 2 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.

[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 data-base on second home-owners, development of a memorandum of understanding with local university campus to help with a household survey, collection of baseline data on 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 seasonal homeowners, or assessing the number of new broadband connections to seasonal homes and the uses of those connections. Impact data will go beyond outputs and outcomes to determine such things as the economic impact of an increased average length of stay for seasonal residents on the area's retail sales or impact of improved access to health care on decisions to move to the region.

[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 emerging structure and plans for the Grow North Regional Economic Partnership.
- Collaboration with identified infrastructure projects (for example Oneida County/SonicNet).
- Engagement and partnership with area broadband service providers.

- Strong partnerships with local governmental units having resources available and willingness to serve as project sites.
- Strong partnerships with area County-level economic development corporations.
- 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 seasonal homes 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

Five counties, Forest, Langlade, Lincoln, Oneida, Vilas make up Region 2 (Grow North). Dozens of small towns and cities with the majority having populations lower than 2000 people make up this five county region. Merrill is the largest city in the region with an estimated population of over 10,000 people. Rhinelander and Antigo each have populations larger than 8,000 people. Minocqua has an estimated population of just over 5,000 people.

### Population

With the exception of Vilas County, the population in all five counties has declined over the past decade (population grew 2.2% in Vilas County between 2000 and 2009). Forest County experienced the largest percentage population decline losing 4.2% of its population over this time period. Overall, total population in the five County Region declined from 118,210 in 2000 to 116,443 in 2009 (-1.7%). During this time period, the state's population grew 5.4%.

Compared to the state, the region is very rural with an average of 22.9 people per square mile compared to an average of 86.3 people per square mile for the state. Forest County is least densely populated in the region with an average of 9.2 people per square mile.

### Demography

The proportion of the Region's population over the age of 65 is substantially greater in Region 2 compared to the state average. Based on 2008 estimates, 21.4% of the region's population is older than 65 compared to an average of 13.3% of the state's population being

older than 65. In Vilas County, more than a quarter of the population are estimated to be older than 65.

American Indians make up a substantial proportion of the total population of both Forest (12.4%) and Vilas (9.4%) Counties. Overall, an estimated 4.8% of the Region's population in 2008 is American Indian compared to an average of 1% of the state.

The population of the five County Region have graduated from High School is higher than the national average, but lower than the state average. Specifically, 82.3% 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. Forest County has the lowest High School educational attainment with an estimated 78.5% of that counties population over the age of 25 with a High School Diploma or higher. In Vilas and Oneida Counties, more than 85% of the adult population have a High School diploma or greater.

The proportion of the population graduating from a four-year degree program is substantially lower than for the state average. Just under 15% of the region's 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 five counties in the region have a lower proportion of the population over 25 with a Bachelor's degree than the state average. Only Oneida County has a fifth of the adult population with a Bachelor's degree or higher. In Forest and Langlade Counties less than 12% of the population have earned at least a four-year degree.

**Median Household Income**

2007 per capita income in the region is \$29,800 compared to an average of \$36,272 for the state of Wisconsin. The highest per capita income levels are in Oneida County (\$34,252) and the lowest in Forest County (\$24,823). Poverty rates follow per capita income with a 2007 poverty rate in Forest County of 16% compared to 9% in Lincoln and 10% in Oneida Counties. On average, the poverty rate for the region is 12% compared to an 11% rate for the state.

## Appendix B: Regional Economy

**Economic Engines**

Region 2 has a relatively diversified economic base. 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 Grow North Region is depicted in the following table.

**2010 Region 2 Employment by Major Sector**

Economic Sector	Q1 2010 Regional Employment	Employment Change 2007 - 2010	Sector % of Regional Total (2010)	Sector % of State Total (2010)
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Natural Resource and Mining	779	-129	1.9%	0.8%
Construction	1,420	-1,184	3.4%	3.2%
Manufacturing	5,484	-1,824	13.1%	16.3%
Trade/Transportation & Utilities	9,402	-1,001	22.5%	19.0%
Information Services	501	-103	1.2%	1.8%
Financial Activities	2031	-126	4.85%	5.9%
Professional/Business Services	1,614	-359	3.9%	10.0%
Educ./Health Services	5,353	-150	12.8%	15.0%
Leisure & Hospitality	4,411	-1,744	10.5%	9.0%
Government	9,074	-185	21.7%	15.4%
Other Services	1,772	20	4.2%	3.2%
<i>Regional Total</i>	41,848	-6,856	100%	100%

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

Overall, economic drivers for Region 2 include trade/transportation/utilities; manufacturing; education and health services; and leisure and hospitality. Approximately 22% of employment in the five county region is attributed to trade, transportation services and utilities.

Among the major sectors, government is the second largest job source, employing 9,074 people in 2010. For example, local school districts are among the largest employer in all five counties. Government employment has remained relatively stable since 2001, losing on 185 jobs.

Education and health services represent just less than 13% of all regional employment compared to about 15% of the total state share for this sector. Notably, at least one health service or School District are among the top five employers in all five counties.

Wisconsin is recognized nationally for its dominance in manufacturing employment and manufacturing is also an important sector for Region 2. The manufacturing sector is a major economic driver. Overall, this sector represents approximately 13% of the region's employment compared to about a 16% share for the state as a whole. In Lincoln County, a 23.3% of total employment is attributable to the manufacturing sector. Langlade County represents 19.03% for the same sector. A total of 6,856 jobs were lost between 2007 and the first quarter of 2010.

Leisure and hospitality services are an important component of the regional economy with 10.54% and represent a somewhat larger share of the regional economy than does this sector for the state of Wisconsin with about 9%.

Although it is not a separate sector, tribal government and casinos are among the top five employers in the Region.

Region 2 has faced substantial job losses across all sectors since 2007. The largest single sector decline came in manufacturing where 1,824 jobs were lost, followed by leisure and hospitality where 1,744 jobs were lost.

### **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. Region 2 is a part of the North Central Workforce development region including Adams, Forest, Langlade, Lincoln, Marathon, Oneida, Portage, Vilas and Wood Counties. The following table identifies the projected employment change by major sector for the North Central Workforce Development Region.

In general, the projected future growth prospects are positive for most of the economic drivers in the region. Education and Health Services in particular are expected to add significant jobs over the ten-year 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 same ten-year period. In contrast, the national and statewide trend of declining manufacturing employment is project to continue to adversely impact the Region's employment. Between 2006 and 2016, manufacturing employment is projected to decline 2.8% for the North Central Workforce Development Region. Of that 2.8% Paper Manufacturing is expected to decline -11.5%.

### **Workforce Trends**

The following occupational categories are projected to result in the ten largest net job growth between 2006 and 2016 within the North Central Workforce Development Region of which Region 2 is a part.

- Health Care Practitioners and Technicians 2,830 net new jobs Food Preparation and Serving Occupations 1,900 net new jobs
- Office Administration Support 1,400 net new jobs

- Registered Nurses 1,350 net new jobs
- Health Care Support Occupations 1,340 net new jobs
- Community and Social Service Occupations 1,170 net new jobs
- Business & Financial Occupations 1,010 net new jobs
- Personal Care Occupations 850 net new jobs
- Building and Grounds Maintenance 790 net new jobs
- Sales and Related Occupations 740 net new jobs

Regional job growth is projected to grow across a wide spectrum of occupational skill categories, but with a particular emphasis in health 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.

## Appendix C: Broadband Availability

### Wireline Broadband Service Coverage in Region 2 Area

A review of the LinkWISCONSIN interactive broadband map (<http://wi.linkamericadata.org/>) highlights significant gaps in broadband service throughout all Counties in the North Central 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:

County	Percent Population in Census Blocks With Advertised Maximum Download Speeds Available At:				
	≥ 10 Mbps	3 to 10 Mbps	< 3 Mbps	Mobile Option Only	No Option Greater than 768 kbps.
Forest	46.82	46.11	4.79	4.79	2.28
Langlade	54.08	6.27	39.66	39.66	0.00
Lincoln	37.37	25.31	37.25	37.25	0.07
Oneida	67.52	27.46	5.01	5.01	0.01
Vilas	39.95	33.85	30.20	30.20	0.00

Source: LinkWISCONSIN Broadband Provider Survey, December 2010

All five Counties in the Grow North Region 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 areas with slower broadband speeds, it is common that the only broadband option is mobile wireless.

Langlade, Lincoln and Vilas Counties have the largest percentage of the population living in Census Blocks with less than 3 Mbps availability, in many cases in areas where there is only a mobile broadband option Oneida 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.

## 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. Among nine regions, broadband adoption was lowest in Region 2 at 50%.

### **Barriers to Adoption**

One factor impacting adoption in Region 2 is availability of broadband supply as noted in Appendix C. On average, nearly one quarter of the population in Region 2 live in a Census Block where broadband service in the area where mobile cellular service is the only option. And even in those areas mobile service is available, there are many places where service is not available do to terrain and other factors.

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

Among people living in Region 2 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. Affordability in general is a frequently cited barrier to Internet access cited by Region 2 residents. This in part may be linked to availability of affordable service options.

### **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 Wisconsin, 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 2 compared to other parts of the state (See demographics in Appendix A).

### **How people access the Internet**

Broadband adoption is also impacted by people's access to devices used to access the Internet.

As noted above 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 to 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.