

Region 4 Broadband Investment Plan

Final - December 16, 2011

Background

[1] The Region 4 Broadband Planning Team met regularly for approximately one-year beginning November 2010 to assess opportunities to enhance economic growth and quality of life in the region. 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

[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 social security and Medicare 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] The Region 4 Broadband Planning Team proposes to improve the affordable availability and use of broadband to support business development as well as telecommuting opportunities, with an emphasis on areas that are outside of major population centers. This priority recognizes broadband service is generally less available in outlying rural areas. Ensuring the region's workforce is connected to their employers no matter where they live, and also that local business can prosper and contribute to the tax base of smaller towns and villages is particularly important to the region's future economic growth. By expanding affordable broadband connections to rural businesses and telecommuters in the region, better access to education, health care, government services, energy management, public safety and other important objectives can be achieved.

[4] This document begins with a description of the regional need and opportunity, followed by an outline of a specific action initiative to expand both access and adoption of broadband for business development and telecommuting. The proposed plan is careful to build on and complement other existing related broadband development initiatives happening in the region at the same time.

Priority Need

[1] The Region 4 includes three Counties Marathon, Wood and Portage. The economy in these three Counties is less impacted by the recent national economic recession than

several other areas of the states. Recent (December 2010) Wisconsin Department of Workforce Development statistics indicate Counties in the Region have unemployment rates lower than the 7.5% statewide average. Economic diversification is one factor that has helped the area maintain a relatively strong economy. Notably, compared to the statewide average in 2010, the region has a higher percentage of employment in five major sectors, natural resources, manufacturing, financial services, education and health services as well as “other” services.

[2] However, most of the job opportunities are clustered in the region’s larger communities. People living in outlying communities often commute substantial distances to work. A recent Wisconsin household survey found that in general six out of ten people who are employed outside the home commute five or more days per week to work. However, in Region 4, eight out of ten people commute five or more days per week to work.

[3] On the flip side, the proportional number of Region 4 residents working from home or running a home-based business is substantially less than for the state.

[4] Only about two percent of Region 4 residents work from home and only 7 percent run a home-based business. Statewide, approximately 5 percent work from home and 9 percent run a home-based business.

[5] The pattern of job commuting hinders business development in smaller communities as commuters are more likely to also shop and consume services in places they work rather than in their home communities. The implications of a high rate of work commuting go beyond business viability in outlying communities and include detrimental impacts on area tax revenues, health care, education and other core services in rural communities within the region.

Overview of Regional Opportunity

[1] The wider availability and adoption of broadband has the potential to reduce work commutes from rural locations in the region contributing to economic development and more sustainable rural communities. Specifically:

- The ability to productively work from home makes it more likely that rural residents will shop and purchase services locally rather than traveling to the urban centers. Broadband enabled telecommuting fosters new businesses and services.
- With more people shopping locally, small businesses in outlying areas have more opportunities.
- With better available and/or widely utilized broadband, people living anywhere have the potential to start new businesses serving markets around the world.

[2] For example, Dave McHone, Vice President, Business Continuity and Development for Travel Guard states:

“Companies, like Travel Guard, Inc, are constantly challenged with utilizing ‘Best Practices’ to remain competitive in today’s business environment. Specifically, in our business, it is critical to maximize today’s advances in systems and technology. One of the critical components of success, for a business like Travel Guard, is to be able to effectively communicate with our employee base, from remote locations. There are many advantages to be able to compliment our business model with “Home Based” employees, servicing our clients at the point, and time in place, where they need assistance. Our most critical limitation at present is the limited capabilities of broadband coverage, in central Wisconsin. Due to these limitations, we too often have to look at alternative locations, throughout the United States, to continue to grow and expand our business model. Additionally, our parent company continues to express concern about our limited communications capabilities as they consider moving and consolidating other operations, into central Wisconsin.”

[3] Joe Brickweg, Director of IS Operations for Marshfield Clinic indicates:

“As a healthcare provider in a rural area we need the ability for our patients and staff to have fast reliable access to the Internet. We use the Internet to provide Telehealth services for our patients. We also need the Internet to provide work-from-home options for our staff.”

[4] The opportunity to leverage broadband to expand rural business development and home-based work includes elements of both supply and demand. Affordable broadband solutions tend to be less available in rural locations compared to the larger population centers.

[5] The major population centers within the region have at least one (usually more than one) wireline broadband provider offering a service with download speeds of 3 Mbps or greater. Service at this level is adequate to support most typical small business and telecommuting functions ranging from the ability to utilize standard business web applications to basic video-conferencing. Outlying areas away from these population centers are less likely to have a broadband provider offering this level of service. A deeper look at the LinkWISCONSIN provider survey data indicates that most all areas of the region do have a mobile provider option, however the speeds delivered by mobile providers are reported to be generally less than 3 Mbps.

[6] Area companies like TDS are continuing to invest in new improved services, including new investments supported in part by federal stimulus funds to address gaps in underserved areas of the state.

Drew Petersen, Vice President – Legislative Affairs and Communications, TDS Telecommunications Corp states:

“We understand how critical broadband access is to the quality of life in Wisconsin. To date, TDS has deployed broadband to nearly 96% of our customers in the state.

These stimulus projects will help us reach out to the most rural and hard to reach customers in our serving areas.”

Jamey Lysne, Director of Operations for Solarus conveys:

“Solarus covers 99% of their local serving territory with broadband access. We believe that having a robust broadband infrastructure for residential and business customers is a key competitive advantage for our community.”

[7] Addressing gaps in current broadband service are not in themselves a solution. In fact many businesses have an opportunity to utilize broadband services to help their business grow, but for various reasons choose not to. Businesses of all types often face barriers to adoption for reasons ranging from lack of capital to buy equipment, to lack of knowledge and confidence of how to utilize on-line tools, to difficulty in hiring workers with appropriate technology skills. Consequently to truly achieve the desired benefits, it is also necessary to identify specific barriers to business adoption of broadband and organize programmatic solutions to address those barriers.

Proposed Broadband Investment

[1] Additional regional investment is needed for research, awareness programs and other strategic actions to expand broadband access and use among business owners, potential entrepreneurs and teleworkers especially in areas presently underserved by broadband.

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

Type of Investment	Activities	Responsibility
Leadership	<ul style="list-style-type: none">• Establish commitment from appropriate leadership organization.• Solicit and manage regional partnerships.• Coordinate with UW Extension demonstration project.• Apply for and manage grants if needed.• On-going communication.	<ul style="list-style-type: none">• Centergy will convene appropriate stakeholder throughout the region to determine role, responsibilities and budget requirements.
Research	<ul style="list-style-type: none">• Create regional database business contacts.• Conduct survey of business owners to assess:<ul style="list-style-type: none">○ Current broadband access	<ul style="list-style-type: none">• LinkWISCONSIN/PSC will provide examples of survey questions and on-line tools to support research.

Type of Investment	Activities	Responsibility
	<ul style="list-style-type: none"> ○ Barriers to the adoption of broadband. ○ Interest in adopting or expanding telecommuting practice. ○ Business opportunities that could be advanced through better available broadband. ● Assess broadband gaps in broadband access to area businesses. 	<ul style="list-style-type: none"> ● An appropriate higher education partner will be required to manage databases and support analysis. ● Coordination where possible with other related regional initiatives. ● Coordination with other WI regions.
Awareness Programs	<ul style="list-style-type: none"> ● Implement targeted education directed towards identified needs ● Match regional resources (such as business training programs, computer literacy training, telework support, etc. with needs. 	<ul style="list-style-type: none"> ● Local coordinating committee to be convened by Centergy. ● Partnership with area higher education initiatives where appropriate. ● PSC will help with connections to other regions with shared objectives.
Address Broadband Service Gaps	<ul style="list-style-type: none"> ● Engage providers to find solutions critical broadband service gaps ● Apply for broadband infrastructure grants if appropriate. 	<ul style="list-style-type: none"> ● Local coordinating committee to be convened by Centergy. ● Coordination infrastructure plans developed through UW Extension demonstration project.

Key Tasks and Timeline

Phase 1: Detailed Needs Assessment and Strategy Refinement

Summer to Fall 2011

Task 1.1

Centergy will convene technical experts and seek collaboration of area business organizations to facilitate a survey of area businesses. Working with local business organizations a mailing and e-mail list will be developed. A local partner will be sought to manage the business address database for purposes of survey research. Yellow Pages USA available through the local library system may provide a good starting point for developing a targeted business list. The Region 4 business survey will be directed to two

populations: 1) Larger businesses in the region's major population centers that depend on a workforce coming from the surrounding area; and 2) small and mid-sized business located in communities with a population less than 2,500 people. The business survey plan will be coordinated with the UW Extension demonstration project to avoid duplication of effort.

Task 1.2

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

- Barriers to adopting available broadband where available;
- Interest in starting a home-based business or working from home while in the region; or
- Interest among local businesses to implement or expand tele-commuting practices that would enable employees living in outlying areas to work from home one or more days per week.

Possible assistance for design of the survey may come for local technical colleges and university campuses. The Wisconsin PSC and LinkWISCONSIN staff can also provide expertise on survey design as well as on-line tools to support the survey process.

Task 1.3

The survey will be distributed in partnership with area business organizations using two approaches. Where e-mail contact information is available, an on-line version of the survey will be distributed to area businesses. For those businesses 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 will join local business groups to get the word out and expand participation.

Task 1.4

Information collected through survey will be organized into an appropriate database with information tabulated. If possible, this task will be accomplished in collaboration with a local technical college or university in the region to be identified.

Task 1.5

Desired broadband business applications described by business owners will guide the research team in determining broadband service and connectivity needs. The provider-supplied data collected by LinkWISCONSIN will be analyzed to assess current broadband connectivity within the region and identify specific areas where the current connectivity appears deficient to meet local business development needs.

Phase 2: Implement Awareness Programs

Spring to Summer 2012

Task 2.1

The results of business surveys implemented in Phase 1 will be analyzed to assess barriers that prevent businesses from accessing and/or adopting broadband services. Both issues related to lack of affordable broadband service options and adoption concerns such as lack of capital to purchase equipment, employee training needs or lack of perceived value will be assessed.

Task 2.2

A regional task force will be formed to identify potential solutions to these issues including solutions that can be facilitated through broadband. Where possible, partnerships will be forged with universities, technical colleges, banks, non-profit organizations, state government and other organizations with resources to help address business 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 4 will reach out to other areas of Wisconsin working on similar issues to explore synergies and opportunities to work together to implement solutions.

Task 2.3

Approaches will be developed to reach out to potential entrepreneurs. Once responsive initiatives are identified, a systematic program can be implemented to expand awareness of available resources to help both existing businesses and potential entrepreneurs leverage broadband services to expand or start new businesses. 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 to them. Where appropriate, these awareness programs will include collaboration with the UW Extension demonstration project and other area partners such as major business associations.

Phase 3: Address Broadband Service Gaps

Spring to Summer, 2012

Task 3.1

Centergy will convene a service gap team including but not limited to local providers representing multiple technologies to review identified broadband service gaps to areas and identify solutions. The team will include representation from the UW Extension demonstration project to ensure coordination with backbone infrastructure deployed as a part of that project.

Task 3.2

The team will review available data including provider reported availability, demographic data, business survey results and other information to prioritize unserved areas for potential expansion of broadband service. In addition the team will assess options and solutions. Priority will be directed to areas where a business case for at least one provider for expansion can be identified.

Task 3.3

Regional support for provider, municipal or other organizational loan/grant applications will be organized as needed to advance solutions to broadband gaps in areas where there is business interest.

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

A half-time paid professional is needed 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 the business survey design and analysis. A potential source for these needed skills is 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

Anticipated Outcomes and Impacts

[1] 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.
- Increased rate of entrepreneurial business formation in rural communities throughout the region. For purposes of this project, rural communities will be defined as incorporated places smaller than 2,500 people.
- Job opportunities through means such as telecommuting will be more accessible.
- Reduced average days per week commuting to work.
- Improved access to vital basic services such as health care, government, and financial services.
- Strengthen tax base in rural areas associated with new business formation and better access to jobs and critical public services.
- Expansion of broadband service investment in rural locations.

Three-Year Objectives

[2] The following PRELIMINARY objectives are targeted for the three county region 4 by 2014:

- Ninety percent of “rural” (incorporated places smaller than 2,500 people) homes and businesses in the region will have access to a broadband connection of 3.0 Mbps download or greater.
- Among rural businesses that do not adopt broadband in 2011, at least 25 percent will adopt and use broadband within their business by 2014.
- The number businesses in the region with formal telecommuting policies will increase by 20 percent.
- At least 25 new businesses will be formed in rural areas within the region that indicate broadband access was a “very important” factor that enabled them to locate outside of major population centers.
- At least 20 % of rural businesses in the region will use a broadband service connection to access training or educational content to support their business.
- At least 20 % of rural businesses will report marketing a product or service on-line.

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

Monitoring and Evaluation

[1] Subject to available funding, the LinkWISCONSIN/Public Service Commission Team will support Region 4 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 database on business Internet usage, development of a memorandum of understanding with local university campus to help with a business survey, 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 the number of new broadband connections to areas with rural businesses 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 emerging structure and plans for the Centergy Economic Partnership.
- Collaboration with the UW Extension Broadband Demonstration Project.
- 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

Three counties, Marathon, Portage and Wood make up Region 4. The vast majority of the communities in the three county Region have a population under 2,500 people with many smaller than 1000 people. Among the communities in the Region, Wausau is the largest with an estimated 39,106 people, followed by Stevens Point with an estimated population of 26,717. Marshfield (19,118); Wisconsin Rapids (18,565) and Plover (11,445). Rib Mountain, Hull, Grand Rapids and Saragota all have a population base between 5,000 and 10,000 people.

Population

The total population of the three County Region is estimated to be 268,575 in 2009. Nearly one-half of that population lives in Marathon County (125,000).

Overall population in the region grew 1.8% between 2000 and 2009 compared to a statewide average growth rate of 5.4% during this same time period. However, there is substantial variance in population growth rates among the three counties. Population grew 4.6% in Marathon County and 3.0 % in Portage County while declining 2.2% in Wood County.

Average population density for the region is equal to the state at an estimated 86.3 persons per square mile. Average population density is also fairly even among the three counties, with 83.5, 86.3 and 91.4 people per square mile in Marathon, Portage and Wood County respectively.

Demography

The demographics of the region are also reasonably comparable to the state as a whole.

14.2% of the Region's population is 65 or older compared to 13.3% for the state. On the other end of the age scale, 22.2% of the Region's population is under the age of 18 compared to 23.4% for the state. Wood County has the oldest population with 17.5% age 65 or more. In Portage County, 11.3% are age 65 or older. Marathon County, however, has the highest percentage under the age of 18 (23.7%).

There is only limited racial diversity in the region. 95.2% of the population is "white" compared to 89.7% for the state and 79.8% for the nation.

The percentage of the population with at least a High School education within the region is relatively uniform among the three counties at approximately 85%, equal to the state average. However, there are substantial differences among the counties in percent of adults with a Bachelor's Degree or higher. In Marathon County 23.4% of the population have a Bachelor's Degree or higher. 18.3% and 16.9% of the adult population in Marathon and Wood County respectively have this level of educational attainment. Statewide, 22.4% of the population has a Bachelor's Degree or higher.

Median Household Income

Per Capita and median household income for the three county area also is reasonably comparable to the state as a whole. The region's 2008 median household income is \$50,771 and per 2007 per capita income is \$34,549. This compares with median household income of \$52,103 and per capita income of \$36,272 for the state.

Among the three counties, Wood has the lowest Median household income at \$46,459 and Portage County has the lowest per capita income at \$32,450. Median household income is highest in Marathon County (\$54,804) Per capita income is highest in Wood County (\$36,028).

Appendix B: Regional Economy

Economic Engines

Region 4 benefits from a diversified economic base. The U.S. Bureau of Labor Statistics organizes data into ten major sectors reflecting key economic drivers in the modern economy. March 2010 employment in each of these sectors for the Centergy Region is depicted in the following table.

2010 Region 4 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	1867	-139	1.4%	0.8%
Construction	3,310	-2174	2.5%	3.2%

Manufacturing	23,106	-5,932	17.1%	16.3%
Trade/Transportation & Utilities	30,147	-3,369	22.4%	19.0%
Information Services	1,851	-439	1.4%	1.8%
Financial Activities	10,269	-1,012	7.6%	5.9%
Professional/Business Services	7,883	-430	5.9%	10.0%
Educ./Health Services	23,769	313	17.6%	15.0%
Leisure & Hospitality	10,431	-1,255	7.7%	9.0%
Government	17,457	784	13.0%%	15.4%
Other Services	4,649	-71	3.5%	3.2%
Regional Total	134,741	-13,724	100%	100%

Source: US Bureau of Labor and Statistics, 2007 - 2010

Overall, economic drivers for Region 4 include education; health services; finance and insurance; food manufacturing, wood related manufacturing; industrial manufacturing; retail trade, transportation services, agriculture and forestry. Over one-fifth of employment in the three County area is attributed to trade, transportation services and utilities. This represents a slightly larger sector share than is the case for the state as a whole. At the same time, 3,369 jobs were lost from this major combined sector between 2007 and 2010.

The combined sectors of "education and health services" represent 17.6 percent of all regional employment compared to about 15 percent of the total state share for this sector. This sector is one of the few that has added net jobs over the past three years. Hospitals are among the top five employers in all three counties. Similarly higher education and local school districts are major employers in all three counties.

The specialized finance and insurance sector contributes is a major economic driver in the Region. Overall, this sector represents approximately 7.6 percent of the region's employment compared to about a 5.9 percent share for the state as a whole. In Portage County, nearly 13 percent of total employment is attributable to the finance and insurance sector. Finance, like other sectors has lost jobs over the past three years.

Manufacturing is also an important economic driver for the region representing about 17 % of area employment. The region is host to large manufacturing operations in food, wood and other products. Reflecting state and national trends, the Region has lost nearly 6,000 manufacturing jobs over the past three years.

Approximately 13% of the area workforce are employed by federal, state or local government.

Finally, while employing a relatively few number of individuals employed in agriculture and forestry both are important regional industries. According to the 2007 US Census of Agriculture, Marathon County had the third largest volume of agriculture sales in the state with over 307 million dollars of sales.

Economic Trends

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 4 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 important Finance and Insurance 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 Centergy Region employment. Between 2006 and 2016, manufacturing employment is projected to decline 2.8% for the North Central Workforce Development Region.

Workforce Challenges

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 Centergy 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

These projects emphasize 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.

Overall the occupational and industry trends framing economic development in the Centergy 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

A review of the LinkWISCONSIN interactive broadband map (<http://wi.linkamericadata.org/>) highlights gaps in broadband service throughout all three counties in the Centergy region. 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) or 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.
Marathon	74.46	7.85	17.68	16.60	0.0
Portage	69.69	18.07	12.24	5.89	0.0
Wood	83.54	3.89	12.57	1.77	0.0

Source: LinkWISCONSIN Broadband Provider Survey, Dec. 2010

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.

All three Counties in the Region have significant areas with higher speed broadband service (in excess of 10 Mbps) and areas with broadband service availability below 3 Mbps. In areas with slower broadband speeds, it is common that the only broadband option is mobile wireless.

Of the three counties, Marathon County has 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. Wood 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.

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 among lowest in Region 4 at 52%.

Barriers to Adoption

One factor impacting adoption in Region 2 is availability of broadband supply as noted in Appendix C. On average, approximately 10 percent 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 where broadband service is available at the Census Block level, 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 4 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 4 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.

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.

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.

These driving demographic forces help to explain why Broadband adoption is lower in Region 4 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.

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.