

Region 5 Broadband Investment Plan

Final - October 27, 2011

Background

[1] The Region 5 Broadband Planning Team met regularly between December 2010 and October, 2011 to assess the best strategy to advance broadband availability and use throughout the region. 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.

[2] Region 5 is very diverse with densely populated counties such as Brown County and more rural areas such as Florence, Door, and Menominee Counties. People and businesses in the more rural communities generally have less affordable and fewer broadband service options than those in population centers. Ensuring everyone in the region has access to an affordable broadband option and the ability to use those services is critical to the regional economy and quality of life.

[3] Individual Economic Development Commissions (EDCs), such as in Door County, have been successful organizing local initiatives to fill area broadband service gaps. However, those efforts have not always been easy to sustain and would benefit from expanded regional resource sharing. Within the plan that follows, the Region 5 Broadband Planning Team proposes to expand regional collaboration for broadband service development through the creation and collaborative networking of local Technology Leadership Groups (TLGs). Providing an organizational framework that brings together broadband service providers and diverse leadership within underserved communities is one of the most effective approaches to addressing broadband service gaps. Working together, community leaders and providers can organize customer commitments and facilitate solutions to local barriers to deployments.

[4] This document begins with a description of the regional need and opportunity, followed by an outline of a specific action initiative to strategically form and sustain local Technology Leadership Groups. The 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] Average population density varies widely across the 18 County Region 5 Area. For example, there is an average of more than 400 people per square mile living in Brown County. On the other end of the spectrum Florence, Door, and Menominee Counties all have an average population density of less than 15 people per square mile. Even within an individual county there are substantial differences in population density. As the following chart illustrates, the availability of broadband options is closely associated with population density.

[2] The number of broadband providers available in a given Census Block increases dramatically with population density. In Wisconsin the average population density for Census Blocks with more than 2 broadband provider options is approximately 500 people per square mile. It is much more costly for providers to extend service to more sparsely populated areas and there is less provider economic incentive to deploy broadband services in more rural areas because there are less revenue opportunities. For rural areas with more dispersed population, it is much more typical to have only 1, 2 or no broadband provider options. In most cases at least one of those options is a mobile broadband provider.

[3] The map clip that follows illustrates the distribution of wireline broadband provider options in the Region 5 area. In general areas in and around population centers in the region have at least one provider offering broadband service of 3 Mbps or greater. However in outlying areas there remain significant gaps in wireline service. While in many cases there are mobile providers that offer a broadband service, that service is usually a slower download speed and can be spotty or nonexistent in many more isolated locations.

The following table illustrates the disparity of broadband access across the Region:

		Percent of County Population in CENSUS BLOCKS With Advertised Download Speeds Available at:			
County	Density (Pop/Sq. Mile)	> 10 Mbps	3 to 10 Mbps	< 3 Mbps	Mobile Option Only
Brown	402	94.7	4.4	0.8	0.8
Calumet	112	85.6	4.2	10.1	9.5
Door	11	58.7	16.1	25.2	13.7

Florence	9	27.0	55.8	14.0	14.0
Fond du Lac	130	80.8	2.8	16.4	2.9
Green Lake	48	74.4	20.3	5.3	4.3
Kewaunee	18	52.9	31.9	15.2	10.9
Manitowoc	53	39.3	59.4	1.3	1.3
Marinette	27	64.7	25.5	9.8	9.2
Marquette	31	36.2	34.7	29.1	27.8
Menominee	12	0.00	64.7	35.3	35.3
Oconto	32	61.2	29.8	9.0	7.5
Outagamie	275	93.6	2.7	3.7	2.6
Shawano	45	42.2	30.3	27.6	19.4
Sheboygan	90	95.2	0.3	4.5	1.9
Waupaca	67	64.6	11.4	24.0	3.9
Waushara	38	38.5	38.5	22.9	1.9
Winnebago	282	95.0	2.6	2.3	1.8

Source: Preliminary numbers from LinkWisconsin provider survey. Includes both wireline and wireless technologies. Future research will also create a new column with percent of population living in Census Blocks with less than 1.5 Mbps.

Overview of Regional Opportunity

[1] Providing an organizational framework that brings together broadband service providers and diverse leadership within underserved communities is one of the most effective approaches to addressing broadband service gaps. Working together, community leaders

and providers can organize customer commitments and facilitate solutions to local barriers to deployments.

[2] A template that has proven successful for remote areas engages providers and community leaders in a six-step process:

- Identify gaps in demand
- Preplan and assessment
- Create business strategy and look for investors (either existing or new service providers)
- Promote collaboration to expand network (i.e. seek ways to utilize existing infrastructure rather than a large investment on new sites or facilities)
- Support community awareness and adoption
- Monitor outcomes and impact.

[3] Several Counties in Region 5, including Door County, have experience implementing elements of this six-step process. These efforts have produced localized successes, but would be enhanced with greater region-wide collaboration and sharing of resources. The formation of a Region 5 “umbrella group” can provide a conduit for local Technology Leadership Groups (TLG) to exchange information and coordinate efforts in areas like local group applied strategies, successes and failures, educating elements of the local community and establishing a common voice to effectively lobby state and federal governments.

[4] Under the leadership of Northeast Wisconsin Regional Economic Partnership (NEWREP) and the Region 5 Regional Planning Team, a demonstration TLG network can be formed as a model for potential future expansion to other areas of the state.

Proposed Broadband Investment

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

Type of Investment	Activities	Responsibility
Research to identify underserved areas	<ul style="list-style-type: none">• Review and analyze LinkWisconsin/PSCW provider survey data• Identify and review other broadband availability data for Region 5.• Contact area providers to assess cost of service in underserved areas.	Region 5 Broadband Planning Team with technical and data support from LinkWISCONSIN/PSCW

Type of Investment	Activities	Responsibility
	<ul style="list-style-type: none"> Identify logical regions of interest for TLGs 	
Leadership to form Local Technology Leadership Groups	<ul style="list-style-type: none"> Identify and recruit key partners (universities, technical colleges, economic development organizations, etc.) Establish management and governance structure for umbrella group. Assess resource needs Recruit membership for Local Technology Leadership Groups as appropriate. 	Northeast Wisconsin Regional Economic Partnership (NEWREP) in collaboration with New North will convene key stakeholders to form umbrella steering committee.
Sustainable Operations	<ul style="list-style-type: none"> Research and organize best practices Secure initial staffing and technical assistance partnerships Support TLGs in creating and implementing work-plan. Maintain database of TLGs Maintain project website and other communications technologies. 	Umbrella Steering Committee TBD

Type of Investment	Activities	Responsibility
	<ul style="list-style-type: none"> Support outreach as appropriate 	

Key Tasks and Timeline

Phase 1: Identify Underserved Areas

Spring to Summer 2011

Task 1.1

The Region 5 Broadband Planning Team with support from LinkWisconsin/PSCW will analyze provider survey data to identify areas with a significant population and/or businesses in underserved areas. Most necessary data is available from ongoing provider survey work. Where available, other existing local provider data will be incorporated into this initial assessment. Underserved areas will be defined as Census Blocks not served by a broadband Internet Service Provider offering service of at least 1.5 Mbps download at a base rate of approximately \$40 per month. A preliminary list of underserved communities will be developed from data organized.

Task 1.2

Providers in the targeted underserved areas of the region will be contacted to refine the delineation of underserved places. In particular provider input will be utilized to assess cost of available service and other unique information to help define underserved places and guide the setting of priorities for encouraging the formation of local TLGs.

Task 1.3

This initial research will be utilized to target specific areas within Region 5 where formation of a local TLG is likely to be beneficial. Criteria for targeting specific areas include but are not limited to:

- Number of households in underserved Census Blocks
- Number of businesses in underserved Census Blocks
- Existence of a logical organization to host TLG
- Likely success in attracting provider investment

The geographic areas for which a TLG is responsible will be no smaller than a County.

Phase 2: Form Local Technology Leadership Groups and Umbrella Leadership Team

Fall 2011

Task 2.1

An early task will be to contact and recruit participation from organizations in the region that can provide volunteers, knowledge, experience and other resources needed by TLGs. Many of these organizations are already represented on NEWREP and/or New North. Examples of key organizations include regional groups such as the Door County Economic Development Corporation with local experience in broadband strategies; universities and technical colleges with faculty expertise and student resources; County/Municipal IS departments; regional and local economic development organizations; Broadband service providers and others.

Task 2.2

With existing region-wide membership, the NEWREP and/or New North Economic Development Partnership is well positioned to host an initial organizational meeting of the regional leadership to form an umbrella steering Committee. This umbrella steering Committee could include many if not all members of the Region 5 Broadband Planning Team. This Steering Committee will be responsible for overseeing the recruitment and support of the local TLGs. The initial organizational meeting will include decisions on an appropriate governance structure and resource needs.

Task 2.3

Based on Phase 1 research, several areas in the region will be targeted to form local TLGs. First priority will be directed to supporting existing organizational initiatives in areas with a substantial underserved population. If there is no existing organization, the formation of a new TLG will be encouraged. These groups, consisting of local county/municipal IS personnel, local economic development staff, private sector business representatives, local school districts and concerned private citizens, will function as the driving force in the local initiative.

Phase 3: Provide On-Going Sustainable Support

2012 Forward

Task 3.1

A modest fund raising campaign will be implemented to launch initial technical assistance, creation/maintenance of web resources, and other resources needed by TLGs. This may include seeking contributions from local providers, businesses, and organizations along with identifying and applying for grant resources. Once funds are received, a contract with one or more existing organizations will be issued to implement services to the TLGs.

Task 3.2

The umbrella steering Committee along with funded staff support will develop and support the following to help and engage collaborative community and provider led initiatives to fill broadband gaps in the region.

- Provide a clearinghouse of best practices for community and provider led initiatives to expand broadband access.
- Organize technical assistance for TLGs on issues such as: how to initiate communications with incumbent service providers regarding needs and service gaps; how the group might address issues with local government participation; and guidance on initiating contact and negotiating with new potential service providers.

This project will also establish and maintain an informational TLG website, listserv, social media and other communications with the following goals:

- Provide a conduit for TLG groups and other similar efforts within region 5 and around the state to exchange information and coordinate efforts in areas like local group applied strategies, successes and failures, educating elements of the local community and establishing a common voice to effectively lobby state and federal governments.
- Provide guidance on the information the TLG needs to be able to provide to prospective service providers prior to initial conversations (i.e. detailed mapping of current offerings, demographic studies, recent surveys or market studies etc).
- Disseminate support materials for local legislative, business and educational, and community initiatives.
- Use of blogs and other social media highlighting current developments around the state affecting local broadband initiatives.
- Use of a subscription “list-serve”, Facebook, Twitter and other interactive media to facilitate an ongoing dialog between local groups and other interested parties.

Budget

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, and communication with all stakeholders are clear and consistent. This position would be based within an existing organization. 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

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:

- Greater organized regional capacity to identify, prioritize and implement actions to improve availability and adoption of broadband services, especially in underserved rural areas.
- Improved business case for broadband investment in underserved areas.
- Strengthen tax base in underserved areas associated with new business formation and better access to jobs and critical public services.
- Expansion of affordable broadband service investment in underserved locations.

Three-Year Objectives

[2] The following objectives are targeted for Region 5 by 2014:

- A region-wide umbrella steering Committee with multiple TLGs will be fully operational with adequate staffing and resources for continued leadership needed to advance identified priority broadband investment projects.
- Close to 100 percent of homes, farms and businesses in the region will have access to a broadband connection of 1.5 Mbps download or greater.
- All TLGs will have made significant progress towards at least one demonstrated success of provider collaboration to expand investment into an underserved area.
- Affordable broadband adoption among households and businesses in presently underserved areas will expand at least 20 percent over 2012 levels.

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 5 with design and implementation of 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 existing organizations such as the NEWREP and New North.
- 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 underserved areas 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 loan 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

18 counties including Brown, Calumet, Door, Florence, Fond du Lac, Green Lake, Kewaunee, Manitowoc, Marinette, Marquette, Menominee, Oconto, Outagamie, Shawano, Sheboygan, Waupaca, Waushara, Winnebago make up Region 5. Centrally located, Green Bay is the largest City with over one hundred thousand people. Other than Green Bay, Appleton, Oshkosh, Sheboygan, and Fond du Lac all have populations greater than 40,000. Neenah, Grand Chute, Manitowac, and De Pere all have population greater than 20,000. With several other exceptions, cities and towns in the region are often smaller than 5,000 and often smaller than 2,500 people.

Population

In 2009, and estimated 1,214,746 people live in Region 5. Nearly one-half the region's population lives in the three largest counties, Brown (247,319), Outagamie (177,155) and Winnebago (163,370). Florence and Menominee Counties are the smallest in the region, each with a 2009 population under 5,000 people.

Overall, population in the region grew by 50,712 people or 4.3 percent between 2000 and 2009. This growth rate is slightly slower than the statewide average of 5.4%. Between 2000 and 2009, Brown County experienced a net influx of 20,659 people and Outagamie County an growth of 16,089. These two counties along with Calumet were the fastest growing in the region. Several counties, including Door, Florence, Manitowoc, Marinette, Menominee, and Waupaca however experience population declines over this same time period. Florence experienced a 10.5% loss of population, the largest percentage decline in the region. In terms of population numbers, the larges loss occurred in Manitowoc where population declined by 2,310 people between 2000 and 2009.

Population density also differs substantially across the region. In Brown County, there are more than 400 people per square mile, followed by Winnebago County with 282 people per square mile and Outagamie County with 275 people per square mile. On the other end of

the spectrum, Door, Florence, Kewaunee, and Menominee Counties have less than 20 people per square mile. Overall, average population density for the region approximately 94 people per square compared to about 86 people per square mile for the state.

Demography

Overall, the population for the New North Region is less racially diverse than for the state as a whole. According to 2008 Census estimates, 91.6% of the region's population are white compared to 89.7% of the state's population that are white. However, there are important racial diversity exceptions among individual counties. Notably, 81 percent of the Menominee County population is American Indian and nearly 8 percent are Hispanic. Hispanics represent 6.1% of the population in Brown County and 5.2% of the population in Waushara County compared 5.1% of the states population. Approximately 7 percent of the Shawano population is American Indian compared to an average of 5.5% of the state's overall population.

Overall, the population in Region 5 is older than the state and national average (15.9 % over 65 years of age for Region 5, compared to 13.3% for the state and 12.8 % for the nation). In Marquette, Florence and Door Counties, more than 20% of the population is older than 65. The youngest average population is in Calumet County with 10.7 % of the population older than 65.

In general, high school graduation rates are higher for Wisconsin than for the nation. 85.1 percent of Wisconsin residents have a high school diploma or higher compared to an 80.4 percent for the nation. Educational achievement for the region generally reflects this trend. With the exception of Marquette, Menominee and Waushara Counties that have a lower percentage of the population with a High School Diploma or higher than the national average.

Median Household Income

2007 average per capita income for the New North region is \$32,430 compared to \$36,272 for the state. Door County has the highest 2007 per capita income estimated to be \$39,470. Brown, Calumet, Door, Sheboygan and Winnebago Counties each have estimated 2007 per capita income in excess of \$36,000. Menominee County has the lowest 2007 per capita income in the region at \$20,638.

Appendix B: Regional Economy

Economic Engines

Region 5 has 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 Region is depicted in the following table.

2010 Region 5 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	7,368	NA	1.3%	0.8%
Construction	21,731	-9,014	3.9%	3.2%
Manufacturing	122,538	-21,508	22.04%	16.3%
Trade/Transportation & Utilities	99,667	-12,495	17.9%	19.0%
Information Services	8,189	NA	1.5%	1.8%
Financial Activities	29,535	-1,846	5.3%	5.9%
Professional/Business Services	49,513	-1,551	8.9%	10.0%
Educ./Health Services	72,432	2,880	13.0%	15.0%
Leisure & Hospitality	49,750	-6,708	9.0%	9.0%
Government	69,004	1,766	13.8%	15.4%
Other Services	18,554	-700	3.3%	3.2%
Regional Total	556,073	-49,176	100%	100%

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

Overall, economic drivers for Region 5 include education; health services; manufacturing; trade, transportation services, and local government. Approximately 22% of the Region's total employment is attributed to manufacturing services. This represents a significantly larger sector share of total employment than is the case for the state as a whole. However, as is the case for the state and nation, manufacturing employment for the region declined substantially between 2007 and 2010 (a loss of over 21,000 jobs).

The sector education and health service represents just over 13% of all regional employment compared to about 15% of the total state share for this sector. Health care institutes or local school districts are major employers in all eighteen counties. Education and health care is one of the few sectors with a net job growth over the last several years (2,880 jobs).

The specialized trade, transportation, and utilities sector contributes is a major economic driver. Overall, this sector represents approximately 18% of the region's employment compared to about a 19% share for the state as a whole. Over 21,000 jobs were lost from this sector in Region 5 between 2007 and 2010.

Nearly 14% of the Region's population is employed in a federal, state or local government job in 2010. Government employment expanded by 1,766 jobs between 2007 and 2010.

Economic Forecast

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 majority of Region 5 is a part of the Bay Area and Fox Valley Workforce development regions including Calumet, Fond du Lac, Green Lake, Outagamie, Waupaca, Waushara, and Winnebago, Brown, Door, Florence, Kewaunee, Manitowoc, Marinette, Menominee, Oconto, Shawano, and Sheboygan counties. The following tables identify the projected employment change by major sector for the Bay Area and Fox Valley Workforce Development Regions.

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 the regional employment. Between 2006 and 2016, manufacturing employment is projected to decline 2.8% for the North Central Workforce Development Region.

Workforce Trends

The following occupational categories are projected to result in the ten largest net job growth between 2006 and 2016 within the Bay Area and Fox Valley Workforce Development Regions of which Region 5 is a part.

Bay Area

- Total, All Occupations net change 21,630
- Healthcare Practitioners and Technical Occupations net change 3,210
- Food Preparation and Serving Related Occupations net change 2,960
- Office and Administrative Support Occupations net change 1,890
- Healthcare Support Occupations net change 1,820
- Registered Nurses net change 1,400
- Business and Financial Operations Occupations net change 1,390
- Personal Care and Service Occupations net change 1,260
- Building and Grounds Cleaning and Maintenance Occupations net change 1,210
- Construction and Extraction Occupations net change 1,190

Fox Valley

- Total, All Occupations net change 18,560
- Food Preparation and Serving Related Occupations net change 2,450

- Healthcare Practitioners and Technical Occupations net change 2,390
- Office and Administrative Support Occupations net change 1,810
- Healthcare Support Occupations net change 1,430
- Business and Financial Operations Occupations net change 1,360
- Construction and Extraction Occupations net change 1,250
- Personal Care and Service Occupations net change 1,100
- Building and Grounds Cleaning and Maintenance Occupations net change 1,010
- Sales and Related Occupations net change 980

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 grounds maintenance and food preparation may require less formal post high school education.

Overall the occupational and industry trends framing economic development in Region 5 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 within Region 5 Counties. 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 of County Population in CENSUS BLOCKS With Advertised Download Speeds Available at:			
County	Density (Pop/Sq. Mile)	> 10 Mbps	3 to 10 Mbps	< 3 Mbps	Mobile Option Only
Brown	402.1	94.76	4.41	0.83	0.78
Calumet	112.7	85.62	4.26	10.12	9.53
Door	11.7	58.68	16.14	25.18	13.68
Florence	9.2	27.00	55.80	14.02	14.02
Fond du Lac	130.6	80.80	2.77	16.42	2.90
Green Lake	48.6	74.39	20.29	5.32	4.32
Kewaunee	18.7	52.94	31.90	15.16	10.92
Manitowoc	53.9	39.27	59.44	1.29	1.29
Marinette	27.1	64.72	25.47	9.81	9.15
Marquette	31.7	36.19	34.70	29.11	27.75
Menominee	12.4	0.00	64.73	35.27	35.27
Oconto	32.3	61.17	29.78	9.05	7.52
Outagamie	275.1	93.58	2.74	3.68	2.64

Shawano	45.3	42.19	30.25	27.56	19.41
Sheboygan	90.1	95.22	0.25	4.53	1.93
Waupaca	67.5	64.61	11.41	23.98	3.92
Waushara	38.6	38.53	38.49	22.98	1.86
Winnebago	282.2	95.06	2.60	2.33	1.75

Source: LinkWisconsin provider survey, 2010. Includes both wireline and wireless technologies.

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.

With the exception of Menominee, all other counties in the region have a proportion of the population living in Census Block areas with 10 Mbps download or more. In Brown, Outagamie, Sheboygan and Winnebago Counties, approximately 95% of the population live in Census Blocks with at least 10 Mbps download advertised. These are among the most populated counties in the region.

On the other end of the availability spectrum Door, Marquette, Menominee and Shawano Counties have 25% or more of the population living in Census Blocks with less the 3 Mbps download as the maximum available.

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 in Region 5 ranks in about the middle at 61%. County specific broadband adoption data is not available

at this time. However, the region is very diverse and it is likely that the rate of broadband adoption varies significantly across counties for reasons noted below.

Barriers to Adoption

One factor impacting adoption in Region 5 is availability of broadband supply. As noted in Appendix C, availability differs substantially among counties in the Region. However, there are a number of reasons in addition to availability that are barriers to adoption.

Among people living in Region 5 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 it is a waste of time, followed by “too expensive

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 likely to differ among different areas and populations within the Region (See demographics in Appendix A).

How People Access the Internet

Broadband adoption is also impacted 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.