UPDATE ON BROADBAND INTERNET ACCESS—A WISCONSIN PERSPECTIVE

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I. Necessary definitions for understanding and locating “Broadband” and “Broadband Internet Access” in telecommunications terminology “jungle.”

A. Wisconsin: Strangely, Wisconsin statutes, and especially Ch. 196, do not define either term for regulatory purpose, so resort to federal law definitions appears appropriate.


47 U.S.C. § 153(50) Telecommunications--The term “telecommunications” means the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received.

47 U.S.C. § 153(53) Telecommunications service--The term “telecommunications service” means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

47 U.S.C. § 153(24) Information service--The term “information service” means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available

1 The material herein reflect the author’s research and viewpoints and does not represent any position or determination of the Public Service Commission of Wisconsin or any of its member Commissioners.

2 Section 706 of the Telecommunications Act of 1996 was originally a note to 47 U.S.C § 157, but was subsequently codified at 47 U.S.C. § 1302 by the BDIA.
information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.

47 U.S.C. § 1302(d)(1) Advanced telecommunications capability--The term “advanced telecommunications capability” is defined, without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.

C. “Broadband Internet Access Service” “Broadband” itself is not statutorily defined, but it is well defined at its technical core in that it must have a high-speed transmission link from a customer’s premises “to the World Wide Web or other digital sources.” See, Broadband Reference Guide, at 10, Appendix A. In addition, the “Internet” part of the term is established in the TCP/IP (Transmission Control Protocol/Internet Protocol). TCP/IP is a packaging and addressing system, not dependent upon hardware, that seamlessly links all sorts of devices by providing complete control over routing, addressing, origin, destination, and the content itself, to the originating device. See Peter W. Huber, Michael K. Kellogg, and John Thorne, Federal Telecommunications Law § 11.2.4 (2nd ed. 2014).

II. The Relevant Technology of Broadband Internet Access Service.

A. Transmission speed or “bandwidth.”

1. The speed defining a high-speed transmission link started out very low, at a speed over 200 Kbps in both download and upload directions over the last mile. It was updated to 4 megabits per second (Mbps) download and 1 Mbps upload (4 Mbps/1 Mbps) in the 2010 Sixth Broadband Deployment Report, which for the first time also found under § 706(b) that deployment was not proceeding adequately. The FCC maintained the finding in two subsequent annual deployment reports through 2012.

2. But, as of February 4, 2015, the Federal Communications Commission (FCC), by a 3-2 vote over some heated dissents, introduced a new, higher standard of at least 25 Mbps download and actual upload speed of at least 3 Mbps (25 Mbps/3 Mbps).

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“We can no longer conclude that broadband at speeds of 4 megabits per second (Mbps) download and 1 Mbps upload (4 Mbps/1 Mbps)—a benchmark established in 2010 and relied on in the last three Reports—supports the “advanced” functions Congress identified. Trends in deployment and adoption, the speeds that providers are offering today, and the speeds required to use high-quality video, data, voice, and other broadband applications all point at a new benchmark. The average household has more than 2.5 people, and for family households, the average household size is as high as 4.3. We take the needs of multiple users into account when considering what level of service is necessary to be considered advanced telecommunications capability. We consider, too, the services that providers are offering today, as well as the services that American consumers are choosing. With these factors in mind, we find that, having “advanced telecommunications capability” requires access to actual download speeds of at least 25 Mbps and actual upload speeds of at least 3 Mbps (25 Mbps/3 Mbps).” [Footnotes omitted.]


B. The differing Technology Platforms for Broadband Internet Access

1. The technology can be wireline or wireless-based. For the former, three technological platforms dominate: DSL (digital subscriber line), cable, and fiber (Fiber to the Home (FTTH) or Fiber to the Node (FTTN)). Wireless can be “fixed,” (Wi-Fi), or mobile wireless (3G, 4G, LTE and WI-Max). There is also Broadband over Power Lines (BPL) and Satellite, but this discussion will focus on wireline and wireless.

2. “Broadband Internet Access Service” focuses upon the user’s experience of a unified product as the determining factor, notwithstanding the use of “telecommunications” in the service. For example:

   Wireline broadband Internet access service . . . , is a service that uses existing or future wireline facilities of the telephone network to provide subscribers with Internet access capabilities. [Footnote omitted.] The term “Internet access service” refers to a service that always and necessarily combines computer processing, information provision, and computer interactivity with data transport, enabling end users to run a variety of applications such as e-mail, and access web pages and newsgroups.
[Footnote omitted.] Wireline broadband Internet access service, like cable modem service, is a functionally integrated, finished service that inextricably intertwines information-processing capabilities with data transmission such that the consumer always uses them as a unitary service.

*In the Matters of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, 20 F.C.C.R. 14853 ¶ 9 (2005).*

D. FCC Classification of Broadband Internet Access as an “Information Service.”

The FCC classified Broadband Internet Access Service as an “information service” starting with cable modem service. When that order survived Supreme Court review, the FCC began adding telephone wireline, mobile wireless, and BPL under that classification.


**III. Wisconsin’s Role in the World of Broadband Internet Access Service.**

A. 2011 Wis. Act 22, effective June 9, 2011, reduced the then existing very broad definition of telecommunications service that included broadband data (except where federal preemption applied) to simply voice communication:

Wis. Stat. § 196.01(9m): “Telecommunications service” means the offering for sale of the conveyance of voice, data or other information at any frequency over any part of the electromagnetic spectrum communication, including the sale of service for collection, storage, forwarding, switching, and delivery incidental to such communication
and including the regulated sale of customer premises equipment, regardless of the technology or mode used to make such offering. “Telecommunications service” includes switched access service. “Telecommunications service” does not include cable service or broadcast service. 5

Act 22 repealed Commission jurisdiction over most retail landline telecommunications rates and service matters, leaving only issues regarding number resources, local exchange boundaries and universal service funding. The Commission’s wholesale jurisdiction was retained to enable resolution of competitor-on-competitor suits and to approve interconnection agreements under 47 U.S.C. §§ 251 and 252. To make the Commission’s jurisdiction clear, including its authority to handle numbering and exchange boundary issues, the legislature adopted a kind of catch-all provision in Wis. Stat. § 196.016 to enable cooperation with the federal scheme:

Wis. Stat. § 196.016 Relationship to certain federal telecommunications law. Except as provided in s. 196.50 (2) (j) 2. and 3., nothing in this chapter is intended to either reduce or expand the scope and application of the federal Telecommunications Act of 1996, P.L. 104-104, including the jurisdiction and authority granted to the commission thereunder, and the commission may take any action that the commission is authorized to take under that federal act. (Emphasis added.)

B. Broadband Expansion Grants.

1. Legislative concern for broadband, and implicitly, Broadband Internet Access Service, turned to a grant program enacted in the 2013 Budget Bill, 2013 Wis. Act 20, § 1989B, with an initial authorization of $500,000 for each year of the 2014-15 biennium.

Wis. Stat. 196.504 Broadband Expansion Grant Program:
(1) In this section:
(a) “Eligible applicant” means any of the following:
1. An organization operated for profit or not for profit, including a cooperative.
2. A telecommunications utility.
3. A city, village, town, or county that submits an application in partnership

5 Interestingly, Act 22 effectively re-used the traditional definition, with the modification removing references to technology or mode of communication, to handle right-of-way matters. The legislature enacted new Wis. Stat. § 182.017(1g)(cq) with the apparent intention of ensuring the traditional access of telecommunications utilities and other authorized providers to public rights-of-way, but without regard to the regulatory treatment or categorization of the various services transmitted over the facilities in the public rights-of-way.
(b) “Underserved” means served by fewer than 2 broadband service providers.

(2) The commission shall administer the broadband expansion program and shall have the following powers:

   (a) To make broadband expansion grants to eligible applicants for the purpose of constructing broadband infrastructure in underserved areas designated under par. (d). Grants awarded under this section shall be paid from the appropriation under s. 20.155 (3) (g).

   (b) To prescribe the form, nature, and extent of the information that shall be contained in an application for a grant under this section. The application shall require the applicant to identify the area of the state that will be affected by the proposed project and explain how the proposed project will increase broadband access.

   (c) To establish criteria for evaluating applications and awarding grants under this section. The criteria shall prohibit grants that have the effect of subsidizing the expenses of a telecommunication provider or the monthly bills of telecommunications customers. The criteria shall give priority to projects that include matching funds, that involve public-private partnerships, that affect areas with no broadband service providers, [that are scalable,]6 or that affect a large geographic area or a large number of underserved individuals or communities.

   (d) To designate areas of the state that are underserved as underserved areas.

The Commission has used the application form, not a rulemaking, as the means of qualifying grant recipients as to the project transmission speeds they propose and to identify the unserved or underserved character of the geographical area sought to be served. Also, to render administration of the program more consistent with the intent of statutory language, the Commission does not qualify satellite broadband service, which can serve the entire state, in the number of providers counted to define an underserved area. In addition, before awards are issued, the Commission has introduced a limited 10-day period after the grant awards order is issued for objections to be filed by interested applicants who were denied funding.

C. Grant Program in Operation.

1. The purpose of this program is to provide funds in the form of a grant to reimburse a successful applicant for equipment and construction expenses incurred to extend or improve broadband telecommunications service in underserved areas of the state.

   ▪ For purposes of this grant program, broadband service means a communications service providing to end users two-way data transmission

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6 Proposed for addition in 2015-17 Biennial Budget, Assembly Bill 21, § 3537.
with a speed of at least 3 mbps for download transmission and at least 768 kbps for upload transmission.

- For purposes of this grant program, an “underserved area” means:
  - a census block, as defined by the US Department of Commerce, that is served by fewer than 2 broadband service providers, or
  - an area that an applicant has demonstrated to be underserved notwithstanding the fact that the proposed service area lies within a census block that has been designated as served.

2. Grant funds awarded under this program must be used for the sole purpose of constructing broadband infrastructure in underserved areas covered by the application. Grant funds may not be used to subsidize the operating costs of a telecommunications provider or the monthly bills of a telecommunications services customer.

3. Eligibility is straight forward, except that municipalities may not make applications without securing a private partner. This reflects an apparent legislative desire to avoid having municipalities as sole owners or operators of broadband networks. While Reedsburg is apparently a successful competitive local exchange carrier operator, Antigo, Jackson, and Shawano7 found their ventures less successful and disposed of their operations.

4. In evaluating grant applications, priority is given to applications that address the following factors:
   - Matching funds. This factor gives weight to applications that offer to contribute funds to the project in addition to the funds sought through the grant application. An important point for an applicant is that a grant not appear to be seeking recovery of ordinarily incurred overhead.
   - Public-private partnerships. This factor gives weight to applications that include both public and private partners in a joint undertaking.
   - No existing broadband service. This factor gives weight to applications that serve areas without any broadband service at the time of the application.
   - Project impact. This factor gives weight to applications that serve a larger geographic area or customer base compared to the other competing applications.
   - Public Interest. As indicated in its last order, Docket 5-GT-100,8 the Commission will consider the public interest factors in Wis. Stat. § 196.03(6).

5. The proposed budget for 2016-2017 proposes to add “scalable” to the criteria considered. This factor would give weight to applicants’ projects that can

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7 Antigo in Docket No. 180-TB-100 (Feb. 2, 2010); Jackson in Docket No. 2720-TB-100 (Sept. 9, 2010); and Shawano in Docket No. 5350-DR-100 (Aug. 13, 2012), all received Commission decisions approving their termination of municipal broadband ventures.

8 November 15, 2014, Order Awarding Grants, Docket 5-GT-100, is attached as Appendix B.
accommodate greater capacity and higher transmission speeds in the future. The infrastructure deployed must be able to support broadband service scalable to perhaps as much as 100 Mbps download and upload in underserved areas. Lower scalability thresholds will be considered for high cost, unserved areas. Applicants will likely be encouraged to discuss the long-term prospects of the investment including expected ongoing costs and the prospects of efficient future scalability.

The proposed budget also proposes to shift to the broadband expansion program at the end of each fiscal year or biennium all unencumbered universal service fund appropriations. For this upcoming budget, $6.75 million is proposed for transfer from the USF “surplus” to the grant program in a separate line appropriation. (This amount will likely be much smaller in future years.) There also is a separate appropriation line item of $4.3 million transferred in FY 2013 from DOA to the program. However, both appropriation funds for the broadband program may be subject to a $500,000 grant cap, a matter pending resolution on technical questions to the DOA.

6. The Broadband Expansion Grant program has been in place for two years. During the two year period (Fiscal Years 2014 and 2015), the Commission has awarded a total of $952,580 in broadband grants. To date, the Commission has paid out $100,325 to FY 14 grant recipients. The following is an overview of the grants recently awarded:

- CenturyLink has received about 1/3 of the total grant funds available during FY 14 and 15 for 3 projects to extend its fiber network in Crawford, Forest, and Vilas Counties. TDS Telecom has also received a grant to extend its network in Wood County.
- Two of the grant awards have been for Fiber to the Home (FTTH) projects in St Croix and Vilas Counties.
- Three grant awards went to projects to upgrades and new construction of wireless service in Eau Claire, Oneida, and Vilas Counties.
- One grant award provided funds to construct and upgrade a middle-mile or backbone broadband facility between Rhinelander and Eagle River.
- One grant award focused upon expanding broadband service within a business park outside of Wausau.
- Three smaller grants were awarded to upgrade wireless service for specific sets of customers in Bayfield, Iowa, Grant, and Waupaca Counties.

D. State Broadband Office. This unit, a part of the Commission, administers the Broadband Expansion Grant Program and “works with stakeholders to build partnerships with providers and consumers to enhance broadband across the state.” The link to the newly opened website is http://www.link.wisconsin.gov/.
IV. Does the Commission have new broadband authority under Wis. Stat. § 196.016 and Section 706 of the Telecommunications Act of 1996?

A. The current “net neutrality” debate is the context for this point. The statute in question in § 706(a) and (b):

(a) In general
The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.

(b) Inquiry
The Commission shall, within 30 months after February 8, 1996, and annually thereafter, initiate a notice of inquiry concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) and shall complete the inquiry within 180 days after its initiation. In the inquiry, the Commission shall determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion. If the Commission’s determination is negative, it shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.

47 U.S.C. § 1302(a) and (b).

In 1998, the FCC determined that DSL broadband services involved pure transmission and so were subject to Title II regulation, and in so holding declared that “section 706(a) does not constitute an independent grant of forbearance authority or of authority to employ other regulating methods.” In re Deployment of Wireline Services Offering Advanced Telecommunications Capability, 13 F.C.C.R. 24012, 24014, 24029-30 ¶¶ 3, 35-36 and 24044 ¶ 69 (1998) (Advanced Services Order). In its Comcast Order9 in 2008 the FCC, using § 706, issued a policy statement that compelled a broadband provider to adhere to open network management practices. However, on the appeal, in Comcast Corp. v. FCC, 600 F.3d 642 (D.C. Cir. 2010), the District of Columbia Court of Appeals determined that the FCC had failed in the

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Comcast Order to cite any statutory authority in which its order was reasonably “ancillary” or to explain its departure from its prior holding regarding § 706 in the Advanced Services Order. See history as discussed in Verizon v. FCC, 740 F.3d 623, 636 (2014) (Verizon).

After the Court’s determination in Comcast Corp., the FCC opened a new docket, and issued a new order aimed at wireline broadband network management practices, In re Preserving the Open Internet, 25 F.C.C.R. 17905 (2010) (Open Internet Order). This time the FCC engaged in a thorough discussion of its authority § 706(a) and (b) as a substantive grant of authority, thus reversing its position in the 1998 Advanced Services Order. The D.C. Circuit upheld this new interpretation of § 706 as and noted that the FCC was aided by § 706(b) because of the FCC’s prior findings regarding the inadequate deployment of broadband across the country. Verizon, 740 F.3d at 636-642.10

B. Now that the D.C. Circuit has upheld § 706 as a substantive grant of authority, does the inclusion of “each State commission” in subs. (a), in conjunction with Wis. Stat. § 196.016, grant new authority to the Commission?

There are several questions:

What kind of “regulatory jurisdiction over telecommunications service” qualifies a state commission, provided it has state law authority, to use § 706?

Does the Commission have jurisdiction over broadband services of traditional telecommunications utilities through a combination of:

- The declaratory judgment statute, Wis. Stat. § 227.41;
- The adequacy of “facilities” (i.e., broadband) standard in Wis. Stat. § 196.03(1);
- The infrastructure deployment standard in Wis. Stat. § 196.03(6)(e);
- The enforcement duty in Wis. Stat. § 196.44; and
- The order power in Wis. Stat. § 196.37(2)?

Are the regulatory tools listed in § 706(a) to be utilized those existing under federal law or under state law?

Is it the state’s public interest, convenience and necessity standard that applies, or that of the federal law, or both?

10 Though not necessary to this discussion, the Verizon decision also vacated as exceeding its § 706 authority the FCC’s anti-blocking and anti-discrimination rules that imposed de facto common carriage rules of Title II. The D.C. Circuit held that these requirements violated the legislative separation of common carriage under 47 U.S.C. § 153(51) from the FCC’s information service classifications decisions noted above. Verizon, 740 F.3d at 649-659.
Could the Commission construe Wis. Stat. § 196.016 as authorizing it to use forbearance under its necessary and convenient power in Wis. Stat. § 196.02(1) to remove the restrictions on municipal broadband deployment? The restrictions at issue are in Wis. Stat. § 66.0422(2) and (3d) (municipal broadband subject to prior inquiry regarding existing or planned competitive offerings) and in Wis. Stat. § 196.204(2m)(c) (municipal broadband for nondiscriminatory wholesale sale only to retail providers).

Could the Commission utilize a FCC price cap regulation orders as models for price cap regulation permitted to enhance broadband deployment? Given that there is no retail telecommunications price regulation in Wisconsin, use of this tool seems very doubtful.

V. Will the FCC Preempt State Laws Purporting to be Barriers to Broadband Deployment?

A. Chairman Thomas Wheeler indicated in a February 9, 2015, speech in Boulder, Colorado, that “Act Two” (see Appendix C from TRDaily) of his trio of broadband deployment acceleration measures would be an order (likely in WC Docket Nos. 14-115 and 14-116) preempting certain Tennessee and North Carolina statutes that purport to thwart the ability of municipalities to build or expand their broadband networks. He characterized the proposed determination as “adjudicatory” in nature and offering a guiding precedent to guide the FCC, but not directly affecting other state laws. His proposed order is up for consideration at the FCC’s February 26, 2015, Open Meeting.

B. The scope of preemption may be significant. Opponents of the proposed order, USTelecom and NCTA, in a January 29, 2015, ex parte notice letter to the FCC, described pertinent aspects of the state laws in question. They noted that the Tennessee statute, Tenn. Code §7-52-601, allows a municipality to only provide broadband “within its service area.” The North Carolina statute, N.C. Gen. Stat. § 160A-340, permits broadband by a municipality, but the opponents noted that the offering is subject to a number of limitations, among which are restricting services to the city’s corporate limits, not pricing below cost, and not subsidizing the services with other funds. Perhaps the proposed order may distinguish between provisions that are intended to specifically economically hobble a municipal broadband offering, and the types of provisions, such as those in Wis. Stat. §§ 66.0422 and 196.204, that may reflect a broader state governance determination to utilize private sector resources first, while limiting municipalities to “core” infrastructure investments.

C. Many opponents, NARUC among them, have weighed in that the only “unmistakably clear” statement of FCC preemption authority, as required by Nixon v.

11 “Act One” is the 2015 Broadband Progress Report and “Act Three” is the pending 332-page order to reclassify broadband as a Title II telecommunications service, with some undisclosed level of forbearance. See Appendix C.

(a) In general
No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.

(b) State regulatory authority
Nothing in this section shall affect the ability of a State to impose, on a competitively neutral basis and consistent with section 254 of this title, requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers.

(c) State and local government authority

* * *

(d) Preemption
If, after notice and an opportunity for public comment, the Commission determines that a State or local government has permitted or imposed any statute, regulation, or legal requirement that violates subsection (a) or (b) of this section, the Commission shall preempt the enforcement of such statute, regulation, or legal requirement to the extent necessary to correct such violation or inconsistency. 47 U.S.C. § 253 (a) – (d)

Generally, the Supreme Court has been skeptical of federal legislation purporting to impede the ability of states to organize themselves and subordinate units of government. Moreover, because § 253 prescribes when and how the FCC may preempt—and § 706 does not even mention preemption—the opponents argue the FCC is without the necessary “clear statement” of authority. They also argue that no Chevron deference would be in play because judicial statements identifying ambiguity in § 706, see Verizon, 740 F.3d at 641, would logically deny the clear statement needed for preemption authority.

VI. Conclusion

The decisions of February 26 will bear much study; the details will be critical. But also expect much litigation to unfold as promised by many stakeholders, especially the largest providers.
WHAT IS BROADBAND?

As noted earlier, high-speed broadband connections are crucial for government services, healthcare, education, library systems, private businesses, and residents. But, what really is broadband?

Broadband connects people to the Internet. It is a high-speed transmission link from a home, business or school to the World-Wide Web and other digital resources. It replaces a traditional “dial-up” or narrow band telephone connection since it is always on and allows you to use multiple services at the same time. For example, you don’t need to disconnect from the Internet to make a telephone call.

Broadband is available for different technologies (laptops, mobile phones, tablets) and from many different Internet Service Providers (ISPs). With compatible equipment, broadband connections allow a user to support many different devices at once. You can access the Internet (i.e., surf the world-wide-web, listen to music, check your email, visit social media sites, etc.), watch TV, and use your telephone. Often these services (Internet, phone, and TV) are packaged together or **bundled** so one provider (one bill) offers all these options to meet your household or small business needs. Broadband service providers can be telephone or cable companies, a wireless network provider (cell phone companies) or satellite service.

Broadband infrastructure consists of the backbone, the middle mile, and the last mile (refer to Figure 3). The backbone consists of very large capacity trunks (usually fiber optics) that connect to multiple fiber-optic lines capable of transmitting large amounts of data. It provides a path for the exchange of information that local or regional networks can connect with for long distance data transmission. These data routes and backbone connections are owned by private providers, commercial, government, academic and other network centers.

The middle mile links the backbone to the ISP or telecommunications providers’ core network or telecommunications exchange. In some communities, the middle mile may connect anchor institutions that enable them to share applications, infrastructure, and other resources.

The last mile brings the connection to residents’ homes and small businesses within the telephone exchange or cable company serving the area. Though all pieces of the broadband infrastructure are important, much focus of the debate and concern on broadband is on the availability (or lack thereof) the last mile connectivity.

Often the difference between residential broadband connections and broadband networks that connect to the middle and last mile is the infrastructure, the connection speeds, and the size of the data files that are transferred. Communities find creative ways to get broadband access to their anchor
institutions and residents; additional resources about different models of building subscribership at a community level are documented and available at:  http://broadband.uwex.edu/resources/

Figure 3. Statewide Network Example

Reference: National Telecommunications and Administration, U.S. Department of Commerce

Understanding the benefits of and potential for broadband and gaining an appreciation of why broadband is vital for communities to thrive in this 21st century is a starting point to move Wisconsin forward. However, to have effective and productive dialog on broadband policy, it is also important to understand the different broadband technologies and what broadband speeds (or bandwidth) are needed for consumers, education, government and business.

Data, Broadband Speeds, and Bandwidth

For many, the jargon of broadband can be as confusing as the technology. Data in a digital sense is made up of bits (a bit is a 0 or 1); 8 bits of data (00101110) is a byte. For broadband data, transmission speeds and bandwidth, you will encounter references to bits and bytes (and kilobits, kilobytes, megabits, megabytes, gigabits and gigabytes and so on (refer to Table 1. Data Measurement). ¹

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¹ Often – though you will encounter inconsistencies –references to bits per second will use this terminology – kbps, mbps, gbps. References to bytes will use this: KB, MB, GB, etc.
Table 1. Data Measurement

<table>
<thead>
<tr>
<th>Data Measurement</th>
<th>Equivalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit</td>
<td>1 bit = single 1 or 0 (on or off)</td>
</tr>
<tr>
<td>Byte</td>
<td>1 byte = 8 bits</td>
</tr>
<tr>
<td>Kilobyte (KB)</td>
<td>1 KB = 1,024 bytes or = 8,192 bits</td>
</tr>
<tr>
<td>Megabyte (MB)</td>
<td>1 MB = 1,024 kilobytes or = 1,048,576 bytes</td>
</tr>
<tr>
<td>Gigabyte (GB)</td>
<td>1 GB = 1,024 megabytes or = 1,048,576 kilobytes</td>
</tr>
</tbody>
</table>

**Broadband speed** is how fast data transfers over a connection; speed is measured in bits per second. Data (files stored on your computer or information transmitted over a network) is measured in bytes (megabytes, kilobytes, and so on). The speed at which data moves over a network connection is determined by bandwidth; that is, the size of the “pipe” or broadband technology that the data is traveling on.

For example, data transfers from your computer in packets or bytes of information; a typical packet contains 1,000-1,500 bytes. Every web page you visit receives a series of packets and every email you send leaves your computer as a series of packets; each packet gets to its destination by the best available route. How fast the data gets to its destination depends on the file size (or how much data is being sent) and the bandwidth of the technology the data is traveling on. **Figure 4** shows four different technologies, their related broadband speeds, and the approximate time it would take to download an 11 minute movie clip that is 835MB in size. Notice the larger the pipe, or more robust the broadband technology, the faster data can download to its destination.

![Figure 4. Speed Comparison to Download a Movie](image)
Figure 5 shows the data speed capacity or approximate speed ranges for different broadband technologies; the illustration shows the capacity at both a mature state of deployment and conceptual or developmental stage. Wireless technologies are marketed by generation such as in 2G (EDGE), 3G, and 4G as illustrated; however, each generation uses different and more advanced technologies for the wireless service such as Long Term Evolution (LTE) and Wi-Max. Not all broadband technologies are available in every location, and therefore the broadband technology available to you depends on where you live.

![Data Speed Capacity](image)

**Figure 5. Data Speed Capacity**

*(Based on analysis by CTC Technology and Energy, [www.ctcnet.us](http://www.ctcnet.us), October 29, 2013)*

Internet access is most frequently advertised by its download speed; that is, how fast information is downloaded to your computer or device. However, upload and latency speeds are just as important when understanding broadband.

**Download Speed, Upload Speed, and Latency**

*Download speed* is the speed that information on the Internet (e.g., text and graphics) is transferred to your computer; that is, how long it takes your computer to load websites and download files to display on your screen. *Upload speed* is the speed that your computer can transfer or send information to the Internet. For example, if you want to send photos to a website to be printed by your local vendor, you “upload” the photos to the site. Download speeds normally happen at faster speeds than uploads; however, that can depend on broadband connections or how web pages are created.

*Latency* is the amount of time it takes for a small packet of information sent from your computer to reach another computer on the Internet, and then return back to you. This measurement is also referred to as *Ping* and is measured in milliseconds (ms). When you send information from your computer (click
a link, type in a web address, send an email) it waits for confirmation that the data packet was received, thus “latent” time. Latency and bandwidth are the two factors that determine the speed of your network connection.

BROADBAND TECHNOLOGIES

Many different types of broadband technologies are available and the speeds for these technologies vary as noted in Figure 5; not all broadband technologies are available in every location. Internet Service Providers (ISPs) determine the type of broadband technology they can provide and the locations they serve.

ISPs usually advertise broadband by download speeds, or as a download speed “up to” so many mbps; therefore, understanding the actual technology when purchasing broadband can be difficult, and may not be as important as the broadband speed. However, some basic knowledge of the different broadband technologies, and the pros and cons for each, is important when comparing plan features and investing in a broadband service plan. Broadband technologies can be divided into two categories, wired broadband and wireless technologies (refer to Figure 7). As noted in the illustration, wireless networks are similar to wired networks in that they connect to a backbone, usually a fiber trunk. It is only the last mile that is a wireless connection.
Wired Broadband

Wired broadband essentially means there is a physical connection to a physical location (a home or business) through a cable. There are three main types of wired broadband connections for consumer or residential use: DSL, coaxial cable, and fiber. DSL uses traditional copper wire telephone lines. Cable television companies traditionally provide service over coaxial cables. Fiber systems are comprised of glass fiber strands over which optical (light) signals are sent. (Other options for wired broadband include T1 or T3 lines and Broadband over Power Lines (BPL)). With the use of a router, all wired technologies can also provide a Wi-Fi network within the home or business.
DSL

DSL is a wired transmission that uses traditional copper telephone lines already installed to homes and businesses. Availability and speed of DSL service may depend on the distance from a home or business to the closest broadband-equipped telephone company central office or telephone exchange. Figure 8 illustrates a typical DSL connection. A modem in your home connects the computer or wireless router to a copper telephone line using an Ethernet cable. The phone line connects to a digital subscriber line access multiplexer (DSLAM) at the telephone central office or, in some instances, at a remotely located junction box in outlying neighborhoods. The DSLAM, combines multiple signals into one aggregate connection and routes it to the ISPs Internet backbone.

Figure 8. DSL Broadband Connection
There are four types of DSL transmission technologies:

- Asymmetrical Digital Subscriber Line (ADSL)
- Symmetrical Digital Subscriber Line (SDSL)
- High data rate Digital Subscriber Line (HDSL)
- Very High data rate Digital Subscriber Line (VDSL)

ADSL is primarily used by residential customers who surf the Internet, use email, and receive a lot of data but do not send much. ADSL allows faster downstream data transmission over the same line used to provide voice service, without disrupting regular telephone calls on that line. SDSL is typically used by businesses for services such as video conferencing, which need significant bandwidth both upstream and downstream. SDSL upstream speeds are equivalent to download speeds.

HDSL and VDSL are newer and faster forms of DSL typically available to businesses for use with high bandwidth applications like VoIP telephony and HDTV transmission; however, HDSL and VDSL are only available in limited areas.

**DSL: Advantages**

A major advantage of DSL service is that it works with existing wiring. The only equipment needed is a modem plugged into an existing phone jack and filters for each telephone in your home or office. Another benefit of DSL service is that each user has a dedicated link and the speed is constant and will not diminish if more people in your neighborhood are also using DSL. DSL provides reliable broadband service for most residential and small business customers.

**DSL: Disadvantages**

A major disadvantage of DSL service is the inability to deliver the service further than 18,000 feet from the central phone office or other DSLAM location. DSL cannot be reliably delivered to homes or businesses beyond this distance. Another disadvantage is that the upload speeds do not match download speeds. While DSL connections are adequate for the average consumer, with technology enhancements and innovation, the bandwidth that DSL offers may be outdated for many due to its bandwidth constraints.

**Cable**

Cable television companies provide broadband using the same coaxial cables that deliver pictures and sound to your TV set. A cable modem is an external device that normally has two connections: one to the cable wall outlet, the other to a computer. Cable Internet (see Figure 9) is usually faster than DSL.

Subscribers can access their cable modem service by simply turning on their computers, without dialing up an ISP which is referred to as an “always on” connection. You can still watch cable TV while using broadband and get telephone service through Voice over Internet Protocol (VoIP) phone technology. Cable provider’s market their services in bundles, which can be a cost effective way to purchase internet services. One type of bundle is the Triple Play, which includes television, telephone, and internet services. While cable broadband is faster than DSL, transmission speeds vary depending on the type of modem, cable network, and how many people in the neighborhood are using a cable connection.
Cable: **Advantages**

A major benefit of cable modem service is its availability to all cable company customers where the cable network has been upgraded to deliver cable modem service. The distance between your residence and the cable company will not affect your Internet speed. Cable is also generally faster than DSL.

Cable: **Disadvantages**

An obvious disadvantage of cable modem service for rural communities is the lack of cable service beyond the edges of the larger towns. Another disadvantage is that the connection is shared between you and other people on the network segment and therefore speed may vary greatly at different times of the day and can slow down significantly in a neighborhood where many residents using cable connections access the Internet simultaneously. For example, if you live in a neighborhood where cable modem penetration is high you may notice a significant increase in the time it takes to upload and download information in the evening when people return home from work and school. Another disadvantage is that upload speeds never match download speeds.

**Fiber**

Fiber optic technology converts electrical signals to light pulses (on/off) and sends the light pulses through transparent glass fibers about the diameter of a human hair. There is less signal loss or degradation with fiber optic technology than conventional copper wires or coaxial cables. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds.

Figure 10 shows an example of a Fiber to the Home (FTTH) network. Fiber to the Neighborhood (FTTN) is a variation of the technology that runs the fiber to the curb outside, or to a location or “node” somewhere between the provider’s facilities and the customer.
The actual speed depends on how close to your computer the service provider brings the fiber and how the service provider configures the service, including the amount of bandwidth used. For example, a provider can bring fiber to your home (FTTH) that connects to a box outside your home or the provider can bring fiber to the node (FTTN) which means the fiber is terminated in a neighborhood street cabinet possibly miles from your premise and then make a copper connection from the cabinet to your home. The same fiber providing your broadband can simultaneously deliver voice (VoIP) and video services (for example, video-on-demand like Netflix, etc.), and refer to these configurations as bundled services.

**Figure 10. Fiber to the Home**

**Fiber: Advantages**

There are many advantages to using fiber optic cable for telecommunications; the main advantage is the ability to provide higher bandwidth and greater distance between terminals. Compared to conventional copper wire, fiber optic cable can deliver more bandwidth than conventional metal wire. Because of its size, many optical fibers can be bundled into one outer covering, or jacket, allowing for a higher carrying capacity—more phone or cable lines going through one channel. Fiber optic cable can deliver more bandwidth than other broadband technologies at a lower cost of maintenance and allows for future expansion and opportunities as innovative and entrepreneurial concepts evolve.

**Fiber: Disadvantages**

Installing fiber and lighting the fiber cable is expensive and maybe cost-prohibitive for many providers serving rural areas. Fiber cable is fragile and also requires equipment to convert electrical signals into light signals and then reconvert them back into an electrical signal at the receiving end.
Broadband over Power Lines

BPL is the delivery of broadband over the existing low- and medium-voltage electric power distribution network. BPL speeds are comparable to DSL and cable modem speeds. BPL can be provided to homes using existing electrical connections and outlets. BPL is an emerging technology but is not available in Wisconsin.

Broadband over Power Lines: Advantages

BPL can use existing power lines decreasing the cost of installing a new transport infrastructure and the ability to connect a modem to any electric receptacle. BPL also sends and receives data at the same high speed. You can upload mail, video files, and business data as quickly as you can download similar files.

Broadband over Power Lines: Disadvantages

A major hurdle for BPL in rural areas is the cost of equipping the power lines to carry the broadband signal. Financial analysis of several pilot projects determined that there would need to be between four and six homes per transformer to deliver broadband service at prices equivalent to DSL or cable modem service.

Dial-up

Dial-up connections are not typically considered broadband Internet; however, in some locations, dial-up Internet access is the only available connection technology. Dial-up is less expensive than other broadband offerings and it may be adequate for some uses (i.e., text only email), but may not support other uses like gaming, watching videos, etc. because of inadequate bandwidth.

Leased Lines (T1)

T1 (or T3) lines are reserved circuits that are usually leased or rented from a company for telecommunications. These lines operate over copper or fiber cables and are used mainly by businesses to connect offices that are geographically separated with voice and data communications. Leased lines are expensive and rarely used for residential purposes.

Wireless Broadband

Wireless broadband services are similar to wired broadband in that they connect to an internet backbone usually a fiber-optic trunk; however they don’t use cables to connect to the last mile or business/residences. Instead they use Wireless Fidelity (Wi-Fi) connections or radio waves. A computer or mobile device has a wireless adapter that translates data into a radio signal and transmits the signal using an antenna. A wireless router receives the signal, decodes it and then sends it to the Internet through a wired Ethernet connection.

Fixed Wireless

Fixed wireless is a type of high-speed Internet access where connections to service providers use radio signals rather than cables. Fixed wireless offers connections speeds between 1 and 10 mbps and use transmission towers similar to cell phone towers that communicate to a resident’s transceiver equipment that, as the name implies is fixed at the premise. The transceiver equipment communicates
with the providers’ ground stations. Refer to Appendix C: Wisconsin Broadband Service Providers, for a list of fixed wireless broadband providers.

**Wi-Fi**

Wireless fidelity (Wi-Fi) is a fixed, short-range technology that is often used in combination with DSL, fixed wireless, fiber, or cable modem service to connect devices within a home or business to the Internet using a radio link between the location and the service provider’s facility. Wi-Fi service can be available in your home or at community locations (airports, coffee shops, schools, businesses, etc.) and are often called “hotspots.” A Wi-Fi network uses radio waves, similar to two-way radio communications. A computer has a wireless adapter that translates data into a radio signal and transmits it using an antenna. A router receives the signal, decodes it, and then sends the information to the Internet using a physical connection, usually via an Ethernet cable, a cable that carries the broadband signal between the modem, router, computer, and other wired Internet capable devices. Figure 11 shows how a wireless/Wi-Fi network works.
Mobile Wireless (3G, 4G)

Mobile wireless is high-speed wireless broadband connection that is accessible from random locations. The locations depend on the provider’s cellular towers and monthly service plans. Many technologies make up wireless networks, but no matter the technology or acronyms you read or hear, mobile wireless networks are radio systems.

Mobile wireless services are continually being upgraded to provide data transmission speeds considered to be broadband. The faster mobile wireless networks are referred to as 3G or 4G.

The “G” stands for “generation,” meaning 3rd and 4th generation or the evolution of broadband cellular networks; supposedly, each generation provides a faster more secure wireless network. A mobile wireless service requires a base station that is connected to a high capacity landline data transmission network to reach the Internet. In other words, it’s never wired OR wireless; ultimately, it has to be both. Wireless broadband in common usage means that the so-called “last mile” connection to the user is done via radio signals from a tower to a cell phone or other wireless devices (e.g., a tablet).

Wireless standards are defined by the International Telecommunications Union (ITU) and as technologies evolve, some attributes that help define the parameters and differences between generations of wireless networks include the radio frequency bands, the network architecture, and components (i.e. types of antenna) used. Two technologies used with 4G networks include 4G LTE (Long Term Evolution) and Wi-Max. While all wireless technologies coordinate traffic telling devices when to send and receive signals, the difference in the technologies (in this case 4G) is how they accomplish the task.

**Long Term Evolution (LTE)**

LTE is a 4G technology that is based on GSM (Global System for Mobile Communication) or EDGE technology and the UMTS (Universal Mobile Telephone Service)/HSPA (High-speed packet access) network technologies. LTE provides increased peak data rates, reduced latency, scalable bandwidth capacity than 4G predecessors, and is backwards compatibility with existing GSM and UMTS. LTE can manage multi-cast and broadcast streams and handle quick-moving mobile phones. It uses an IP-based network architecture that allows for seamless handovers for voice and data to older model cell towers that use GSM, UMTS or other 3G technologies; it is said to be the 4G technology of choice because of its scalability and speed.

**Wi-Max**

Wi-Max (Worldwide Interoperability for Microwave Access) is another 4th Generation (4G) form of wireless Internet that is similar to Wi-Fi but can provide even faster speeds and cover larger distances. Wi-Max consists of a tower, similar to a cell phone tower, and a receiver often built into a laptop or computer system. Wi-Max is a technology that provides fixed and fully mobile Internet access; it is a contender for “last mile” connectivity in rural and emerging markets where laying fiber, cable, or DSL is not cost effective. In some cases, Wi-Max can be used for redundancy or back-up if a primary wire line connection is down.

Many smaller Wireless Internet Service Providers (WISPs) use Wi-Max or similar technologies to provide Fixed Wireless service. Other companies are deploying Wi-Max to provide mobile broadband or at-home...
broadband connectivity across whole cities or countries. Because a Wi-Max network is more cost effective than DSL or fiber optic, broadband can be made available in locations that previously did not have broadband options. Figure 12 shows an example of how Wi-Max works.

**Figure 12. Wi-Max**

With Wi-Max, there is a non-line of sight between a small antenna on your computer that connects to the Wi-Max tower. The non-line of sight means that lower-wavelength transmissions are not as easily disrupted by physical obstructions (trees, buildings, mountains, etc.) and are better able to diffract, or bend, around obstacles. The line-of-sight backhaul is a fixed dish antenna that points straight at the Wi-Max tower that connects to the Internet backbone via the ISP. A line-of-sight connection is stronger and more stable, so it can send a lot of data with fewer errors.

**Satellite**

Satellite broadband is sometimes the only option available to users in very rural or sparsely populated areas. Like telephone and television services, satellites orbiting the earth provide necessary links for broadband. With satellite service, you must have a clear view of the southern sky. Satellite service can be disrupted by weather conditions and changes in line of sight to the orbiting satellite.
Satellite may have a higher monthly service charge than other broadband options and the need to purchase more home or business equipment compared to the other options. Because satellites are located a significant distance from customers, there are issues of “latency” and therefore a noticeable time lag between sending and receiving data by the end customer. Figure 13 shows how a satellite network connections works.

![Diagram of Satellite Internet](image)

**Figure 13. Satellite Internet**

Downstream and upstream speeds for satellite broadband depend on several factors, including the provider and service package purchased, the consumer’s line of sight to the orbiting satellite, and the weather. Satellite speeds may be slower than DSL and cable modem, but they can be about 10 times faster than the download speed with dial-up Internet access. Service can be disrupted in extreme weather conditions.

**Satellite Broadband: Advantages**

A major advantage of satellite broadband is its ability to deliver service to any location with a clear view of the southern sky. It can be used in rural areas that have no other viable options.
Satellite Broadband: Disadvantages

Satellite broadband offers lower broadband connection speeds than typical DSL, cable modem, and wireless broadband services. Upload speeds are also slow on most systems. Satellite broadband costs more to install and monthly fees are usually higher than wired broadband. Other disadvantages include latency time and potential of poor signal reception due to inclement weather.
ORDER AWARDING GRANTS

This is the Order approving the award of grants for the Broadband Expansion Grant Program for Fiscal Year (FY) 2015. The purpose of the Broadband Expansion Grant Program (Broadband grants) is to foster improved high bandwidth communications services in underserved areas of the state. This program is authorized by Wis. Stat. §§ 20.155(3)(g) and 196.504. A total of $500,000 is available for eligible grant applicants for FY 2015.

This is the second year that the Commission has awarded Broadband grants. In FY 2014, the Commission awarded $500,000 to seven grant projects located in Eau Claire, Grant, Iowa, Vilas and Wood Counties in Wisconsin.

Broadband Grant Applications for FY 2015

Applications for Broadband grants for the FY 2015 grant cycle were due at the Commission on October 13, 2014. The Commission received thirteen applications. The applications together requested a total of $1,860,350.81. The applications proposed projects in thirteen different Wisconsin counties, and proposed a variety of Internet technologies, including telephone, DSL, cable internet, WiFi Internet, wireless internet, fiber backbone, and fiber-to-the-home services.
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The applications were reviewed and rated by a screening panel\(^1\) that provided its evaluation and recommendation to the Commission for its consideration. The Commission discussed this matter at its open meeting of October 24, 2014.

**Opinion**

**Eligibility**

Twelve of the applications were timely filed. The application of Forest County Potawatomi Community and Millennium Economic Development Corporation was received approximately two hours late. At its October 24 open meeting, the Commission waived the filing deadline with respect to the Potawatomi application and accepted the application as timely filed.

Twelve of the applications met the eligibility requirements in Wis. Stat. § 196.504(1)(a). Waupaca OnLine.net (Waupaca OnLine) is a corporate enterprise wholly owned by the city of Waupaca. Commission staff questioned whether Waupaca OnLine is a public entity, a sub-unit of the city of Waupaca. If Waupaca OnLine is a public entity for the purposes of Wis. Stat. § 196.504, then Wis. Stat. § 196.504(1)(a)\(^3\) requires that the applicant have a private partner to be eligible for this grant program. Waupaca OnLine argues that it should be treated as a private entity since the company was created as a municipally-owned competitive local exchange carrier and, until 2012, was certified as a telecommunications utility in this state. The Commission finds it is not necessary to resolve this question at this time. Before receiving the grant funds awarded below, Waupaca OnLine must submit a letter from one private entity, either a non-profit

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\(^1\) The screening panel consisted of analysts Peter Jahn and Dennis Klaila of the Commission staff, and Mary Kluz, Economic Development Outreach Specialist, Broadband and E-Commerce Education Center, UW-Extension.
Awards

Wisconsin Stat. § 196.504 grants the Commission the authority to establish criteria for evaluating grant applications. The statute requires that the criteria adopted by the Commission give priority to applications that include any of four factors:

1. Matching Funds. Did the application commit to match a portion of the grant award as part of the overall construction cost of the project?

2. Public-private partnership. Did the application include both public and private entities that have joined together to submit the application and accomplish the construction project?

3. No existing broadband service. Did the application affect or target an area with no existing broadband service?

4. Size of underserved population served. Did the application affect a large geographic area with underserved individuals or affect a large number of underserved individuals or communities when compared to the other eligible applications?

The Commission may also take into account additional factors, including the public interest considerations set forth in Wis. Stat. § 196.03(6), in deciding which applicants should receive a grant award.

Upon review of the applications and staff evaluation, the Commission awards grants to seven applicants in the amounts set forth in Attachment 1. In the case of the application of Waupaca OnLine, the Commission makes the grant award conditionally and directs the
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Administrator of the Division of Business and Communications Services to ensure that Waupaca OnLine adds a suitable private partner to its application before releasing any grant funds to that applicant.

The Commission denies a grant award to six of the thirteen applicants. In each case, the Commission denies the grant application because it found that the successful grant applications better addressed the factors identified as priorities in Wis. Stat. §§ 196.504 and 196.03(6). The successful grant applications, taken as a whole, also avoided concentrating the available grant funds in a smaller number of projects with high costs of construction.

Appeal process

While Wis. Stat. § 196.504 does not specify an appeal process with respect to any contested award, the Commission finds it is appropriate to adopt an appeal process in the event of a challenge to a broadband grant award. An appeal with respect to an award must be filed with the Commission within 10 business days of the service of the order or determination effecting a grant. An appeal needs to show a material error of law or fact, or any newly discovered information that is sufficiently strong to reverse or modify the award. Any replies to such an appeal must be filed within 3 business days. The abbreviated time periods for appeal and reply are necessary to permit the Commission to timely resolve challenges before grant funds are obligated and proposed projects are undertaken.

Conclusions of Law

1. The Commission has jurisdiction and discretion under Wis. Stat. §§ 196.02(1), 196.03(6), 196.40, 196.44, 196.504, and other provisions of Wis. Stat. ch. 196, to make the
determinations in this order, with or without conditions, and to act or refrain from acting relative to the administration of the broadband grant program authorized under Wis. Stat. § 196.504.

2. The Commission has authority in Wis. Stat. § 196.02(1) to adopt the appeal procedure set forth above as necessary and convenient to its award authority in Wis. Stat. § 196.504.

Order

1. The grant applications listed in Attachment 1 are approved in the award amounts stated therein.

2. The grant applications of the Town of Sumpter, Black Earth Telephone Company, Frontier North (Gills Rock project), Frontier North (Rockbridge and Buck Creek project), Rhinelander Telephone Company, and Midwest Integrated Systems Laboratories, LLC, are denied without prejudice for resubmission in another fiscal year.

3. Each approved grant applicant shall use grant funds for the purchase of equipment and services specifically identified in the budget summary of its grant application and shall comply with all conditions identified in the grant award notification letter. An approved grant applicant shall not use grant funds to subsidize the expenses of a telecommunications provider or the monthly bills of telecommunications customers, and this order provision shall be incorporated as a condition in the grant award notification letter.
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4. The Administrator of the Division of Business and Communications Services is delegated authority to issue grant award notification letters and grant application denial letters, as appropriate, and administer the grant projects approved in this order.

5. Jurisdiction is retained.

Dated at Madison, Wisconsin, this 4\textsuperscript{th} day of November, 2014.

By the Commission:

\begin{signature}
Sandra J. Paske
Secretary to the Commission
\end{signature}

SJP:SK:DK DL:00947648

Attachment
Attachment 1

Approved Broadband Expansion Grant Awards for FY 2015

Village of Weston, Charter Business, MCDEVCO, and Wausau Region Chamber of Commerce
$ 73,977.92

Bayfield County, Norvado f/k/a Chequamegon Telephone Coop.
$ 19,282.00

Forest County Potawatomi Community and Millennium Economic Development Corporation d/b/a/ Forest County Economic Development Partnership
$ 95,500.00

Telephone USA of Wisconsin d/b/a CenturyLink (CL), Crawford County EDC, Prosperity Southwest Wisconsin (PSW), Village of Ferryville, and Town of Freeman
$125,000.00

Waupaca Online
$ 12,369.39

Somerset Telephone Co.
$ 80,000.00

Oneida County EDC, Oneida County, Town of Minoqua, Town of Hazelhurst, Ministry Health Care, Marshfield Clinic, Minoqua J1 School District, Lakeland Union High School, Grow North, and Northwoods synKro LLC
$ 46,450.00

Total Amount of Approved Grant Awards
$452,579.31
TRDaily of February 9, 2015, Reporting on Wheeler Speech in Boulder, Colorado

NATIONAL -- Wheeler defends 'acts' one, two, three of broadband connectivity drama

FCC Chairman Tom Wheeler today defended his overall approach to encouraging more bandwidth for innovation, as well as his proposal for new open Internet rules and Title II reclassification of broadband Internet access service and Internet interconnection, arguing that the policy focus "should be on that which enables the Internet" -- broadband connectivity.

The Chairman unveiled his proposal last week and plans to ask his fellow Commissioners to vote on it in what looks likely to be a 3-2 decision at the agency's Feb. 26 meeting. The draft order as proposed last week would ban blocking, throttling, and paid prioritization by wireline and wireless broadband providers. It would also attempt to future-proof the FCC's rules by adopting a general conduct, or catch-all, rule against practices that hinder the ability of consumers and edge providers to use the Internet, so that the FCC can protect consumers, competition, free expression, and innovation against new practices as they arise.

Speaking at a conference on the digital broadband migration organized by the University of Colorado's Silicon Flatirons Center in Boulder, Colo., Chairman Wheeler said, "Our challenge is to achieve the legitimate goal of economic return as an incentive for investment in broadband infrastructure, and the equally important goal of networks that are fast, fair and open for all Americans."

Using a metaphor he has employed in recent remarks, he said that "Act One" of the FCC's efforts in this area was its recent change in the definition of broadband from 4 megabits per second downstream/1 Mbps upstream to 25 Mbps/3 Mbps.

"The press described this as a decision about speed, such as the speed to download a video. That's true, but while this new standard reflects today's realities, it is also -- and quite possibly most importantly -- an invitation to the innovation that is enabled by increased throughput," the Chairman said.

As he had done during his statement after the vote at the FCC's Jan. 29 meeting on the broadband progress (section 706) report containing the new definition of broadband, Chairman Wheeler read from a broadband provider's pitch to potential customers of the bandwidth they might need for all their various devices: up to 40 Mbps for tablets, up to 40 Mbps for smartphones, and up to 75 Mbps for laptops, televisions, and gaming systems.

"With our vote two weeks ago, we established a standard that anticipates and-as the Telecommunications Act mandates -- encourages a world in which megabits per second isn't just about whether a video buffers, but is about the world in which increasing numbers of devices will be making simultaneous demands on the network; a world in which innovation isn't held back by network capacity," he said.
"Act Two" of the FCC's broadband efforts will be a second item to be voted on at the FCC's Feb. 26 meeting, a draft order that would preempt state laws in Tennessee and North Carolina that restrict municipalities from expanding their broadband networks, he added.

"The issue is simple and direct: when the people, through their elected representatives, take action to expand access to high-speed broadband and offer competitive choices, their will should not be thwarted," Chairman Wheeler said. "Many communities, including these two petitioners, have concluded that existing private sector broadband offerings are not meeting their needs and the only solution is to become directly involved in broadband deployment."

As senior officials did in discussing the muni broadband item with reporters on background last week, Chairman Wheeler today emphasized that the proposed order "is an adjudicatory matter" that will offer precedent to guide FCC action in similar cases but would not have a direct effect on other state laws.

"Act Three" will be the open Internet item to be voted at the Feb. 26 meeting. The Chairman reiterated a story he told last week in a "Wired" op-ed about the failure of NABU, a company that Mr. Wheeler headed in the mid 1980s. NABU provided 1.5 Mbps data connections over cable television infrastructure but failed, Mr. Wheeler contended, because the cable television networks had no open access obligations for that type of service. Meanwhile, AOL became successful delivering dial-up Internet access over the 56 kilobit per second lines of the "open phone network," he said.

Chairman Wheeler added other examples of the importance of access: from the "I want my MTV!" campaign in the 1980s to drum up support from young cable TV viewers for their operators to add MTV, to efforts of Ted Turner to get CNN on cable systems. "Compare that to HuffingtonPost, Vox and other news and information outlets that, thanks to the Internet, didn't have to ask permission," the Chairman said.

He suggested that permissionless innovation by Internet content providers might one day disappear without Title II reclassification, citing a statement by Verizon Communications, Inc.'s attorney during the company's challenge of the FCC's 2010 open Internet rules. "When Verizon was asked in open court if they wanted to restrict access through special commercial terms, their counsel replied, 'I am authorized to state by my client today that but for these rules we would be exploring those commercial arrangements,'" the Chairman recalled.

"Congress wisely created the FCC as an expert agency with flexibility within specific parameters to evolve its rules to keep pace with technology and new markets. The history of the Internet makes clear that we cannot predict the future. What we do know, however, is that any action we take must be strong enough and flexible enough not only to deal with the realities of today, but also to establish the basic ground rules for the as-yet-unimagined," he said.

He reiterated the explanation of his evolving thought on Title II reclassification that he had offered during remarks at International CES last month. "Originally, I believed that the FCC could assure Internet openness through the application of commercial reasonableness and the 'commercial reasonableness' test to determine appropriate behavior of ISPs. But after listening to
countless consumers and innovators, however, I became concerned that the relatively untested 'commercially reasonable' standard might be subsequently interpreted to mean what was reasonable for ISPs in their commercial arrangements, and that, of course, would be the wrong conclusion. It was a possibility that was unacceptable," which led him to turn to Title II and its "just and reasonable" standard, he said.

Chairman Wheeler pushed back against the criticism of Title II reclassification as "'old-style, 1930's monopoly regulation.' It's a good soundbite, but what we are doing bears no resemblance to what they are describing."

"We will forgo sections of Title II that pose a meaningful threat to network investment. That means no rate regulation. That means no tariffing. That means no unbundling. Now I'd note that when applied to mobile voice service over the past two decades, the use of such light-touch Title II -- which, by the way, was sought by the industry; I was their advocate [in his former role as head of CTIA] -- went hand-in-hand with massive investment, almost $300 billion," he said.

However, he emphasized, the agency will not forbear from Title II's section 222 privacy protections and its disability access requirements. -Lynn Stanton,
lynn.stanton@wolterskluwer.com