School and Library Broadband and Internet Access in Wisconsin: A Background Paper

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http://dpi.wi.gov/pld/pdf/bbandnetaccess.pdf

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Events over the past year related to the education and library communities' access to affordable broadband and Internet services have elicited numerous questions on why this has become such a contentious issue in our state. The following paper attempts to answer some of these questions by providing in-depth information on how our schools and libraries get their broadband and Internet access.

Broadband and Internet access play a critical role in educating our students and in providing for the information needs of library patrons. Therefore, the Department of Public Instruction (DPI) has a vested interest in ensuring that our schools and libraries have sufficient broadband and Internet access at an affordable cost. In this regard, it has been—and continues to be—DPI's position that: (1) schools and libraries need the latitude to select the broadband and Internet providers of their choice; and (2) they should have a variety of providers from both the private and public sectors to choose from. Recent attempts by the private sector to eliminate the public/not-for-profit sector limit school and library choice.

At a high level, this is a classic debate on the role of the private and public sectors in the provision of an essential service. While DPI believes there is room for both sectors, we also think there is need for an open and frank discussion on this issue. Recent attempts by the private sector to eliminate the public/not-for-profit sector do not foster this needed dialogue.

The Historical and National Perspective

The recent dispute regarding what entities can or should provide broadband and Internet services in Wisconsin is not a new issue nor are efforts by the private sector to restrict the public sector's provision of these services. Over a decade ago the telecommunication carriers in the state lobbied to get legislation passed to restrict municipalities from providing telecommunications and broadband services. They finally succeeded in 2004.[1] The DPI opposed this legislation because it restricted broadband choice. In 2005 the telecommunication lobby was again successful in getting legislation passed that limited the UW to providing telecommunication services only for its campuses or to carry out its mission.[2] This issue is also not unique to Wisconsin. The *National Broadband Plan,* released by the Federal Communications Commission in March 2010, identified eighteen states that have some statutory restrictions on the public sector providing telecommunications or broadband services.[3] However, most of the restrictions in the various states prevent municipalities from providing these services to the private sector (e.g., businesses, residential households). This is an important distinction in understanding the current debate in Wisconsin

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[1] See 2003 Wisconsin Act 278 at http://legis.wisconsin.gov/2003/data/acts/03Act278.pdf.
[2] See 2005 Wisconsin Act 25, p. 167, section 36.11(49) at http://legis.wisconsin.gov/2005/data/acts/05Act25.pdf.
[3] See Chapter 8, page 153 of the NBP at http://www.broadband.gov/plan/. Also for a good review of this issue, see the March 2011 publication *Publically Owned Broadband Networks* at http://www.newrules.org/sites/newrules.org/files/cmty-bb-map.pdf.

where the telecommunication carriers are attempting to prohibit a *public sector or not-for-profit entity* (i.e., UW, WiscNet) from assisting in the provision of broadband or Internet services to *other public sector entities* (e.g., schools, libraries).

BadgerNet and WiscNet

To understand the school and library broadband and Internet landscape in Wisconsin, it is necessary to have a basic understanding of BadgerNet, the state's broadband network, and WiscNet, the state's largest not-for-profit Internet service provider.

BadgerNet

In 1993, then-Governor Tommy Thompson established a Blue Ribbon Telecommunications Task Force charged with developing a vision of a statewide telecommunications network for education institutions and government agencies. This task force set the foundation for creation of the BadgerNet network in 1995.[4] As of January 2012, BadgerNet connected 2,033 customer sites throughout the state with a breakdown as follows:

- 992 (49%) are TEACH subsidized sites (TEACH is explained below)
- 981 (48%) are state government agency sites
- 60 (3%) are other sites (e.g., counties, UW campuses)

As these statistics show, 97% of BadgerNet sites are those that TEACH subsidizes or are state agency sites which are required to use the network.[5] Very few other public sector agencies use BadgerNet, likely because it is too expensive.

BadgerNet provides broadband circuits and distance education video networking. *It does not provide Internet access*[6] and it does not serve private businesses or residential households. The state does not "own" BadgerNet's circuits or its other networking infrastructure. Rather, at its inception, it was decided to outsource the network to a consortium of telecommunication carriers with AT&T (then Ameritech) as the prime vendor. Since 1995 DOA has undertaken several BadgerNet procurements and contract updates. The latest update was done in November 2011 when DOA and AT&T agreed to extend the current contract to November 2016.[7] The extension includes significant cost reductions of about 50% in bandwidths above 20Mbps and reductions of 20% in bandwidths below 20Mbps.

From the K-12 school and library perspectives, no discussion of BadgerNet is complete without reference to the TEACH program.[8] TEACH (*T*echnology for *E*ducational *Ach*ievement) subsidizes access to BadgerNet for "educational agencies" as defined in state statutes (§16.99(2g)). These include school districts, private K-12 schools, public libraries, private academic institutions, and technical colleges. It is

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[4] For more information on BadgerNet including circuit costs, see http://www.doa.state.wi.us/section_detail.asp?linkcatid=308&linkid=119&locid=155. The BadgerNet Advisory Council advises DOA on network issues. Bob Bocher serves on the council.

[5] The TEACH subsidy goes directly back to the carriers who provide the BadgerNet circuits. State agencies can seek permission from DOA to have another broadband provider.

[6] When BadgerNet started, WiscNet was grandfathered in because it already provided Internet access to most colleges and universities. The carriers that provide the BadgerNet circuits also provide Internet access and DOA has a contract for Internet access from several other ISPs too. See http://www.doa.state.wi.us/subcategory.asp?linksubcatid=1307&linkcatid=308&linkid=119&locid=155.

[7] The contract was to expire in November 2012. Negotiations to extend the contract started in March 2011 after DOA turned down a federal stimulus grant to bring fiber connectivity to 467 schools and libraries on BadgerNet that still had old copper circuits. The grant is referenced later in this paper.

[8] The legislature created TEACH in 1997 as an independent agency with multiple programs including telecommunications access, wiring loans and grants to school districts. Since 2004, it has been part of DOA and has narrowed its focus to a telecommunications access program which subsidizes video and broadband circuits on BadgerNet. For more information see http://www.teachwi.state.wi.us.

important to note that TEACH usually subsidizes only one circuit per education agency. Because most school districts have multiple schools,[9] they are then responsible for funding the circuits needed to link their other schools to the BadgerNet circuit, which is often located at the high school. In most districts the BadgerNet circuit then connects to an Internet service provider for district-wide Internet access. (For typical school and library system wide area network topologies, see the WAN explanation in Appendix B.) Very few of the other schools in a district use BadgerNet because without a TEACH subsidy, it is too costly.[10]

TEACH pays the carriers approximately $26 million annually in subsidies for its 992 sites. TEACH funding comes from two sources: 1) $16.8 million annually is from the state Universal Service Fund,[11] and 2) $10-12 million annually is from the federal E-rate program.[12] Consumers pay for both funds as surcharges on their phone bills. DPI supports the TEACH subsidy because it provides substantial discounts to school districts and libraries, especially in the more costly rural areas of the state. Here are two examples of this discount:[13]

- A library with a 3Mbps circuit pays $1,200 annually to TEACH but the annual BadgerNet contract cost is $9,952.80. TEACH pays $8,752.80 of this—a subsidy of 88%.
- A school with a 100Mbps circuit pays $3,000 annually to TEACH but the annual BadgerNet contract cost is $29,766. TEACH pays $26,766 of this—a subsidy of 90%.

During most of 2011 TEACH funded very few requests for bandwidth increases because of budget limits. The reduced bandwidth costs in the November 2011 BadgerNet contract extension gave TEACH considerable budget latitude thus allowing it to again start funding requests for more bandwidth. In just two months (i.e., by mid-January 2012) TEACH staff processed over 550 requests for bandwidth increases from schools and libraries.[14] Unfortunately, even with the lower circuit costs in the contract extension, TEACH does not have unlimited funds to grant all requests for more bandwidth.[15] Because of this—and to ensure prudent use of its public funds—it often requests bandwidth usage logs to document if a school or library has reached capacity and thus needs a bandwidth increase. However, usage data obviously cannot measure Internet-based services *not* offered because of limited bandwidth. For example, some libraries block or restrict

> The FCC defines broadband as a minimum 4Mbps. 84% of libraries on BadgerNet have less than 4Mbps. Thus based on this definition, most do not have broadband. Many households have more bandwidth than our libraries.
> ——
> Some of our requests for increased bandwidth were denied because the data didn't support an increase. This is true, but it's because our libraries are not now offering some services, like having large computer classes or videoconferencing because of their limited bandwidth. It's a frustrating 'Catch-22' type of situation. —Gus Falkenberg, Technology Manager, Indianhead Library System

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[9] There are 2,219 public schools in the state and 425 school districts. If all districts have one school with a BadgerNet connection, there is still a need to get broadband connectivity to the other 1,7494 schools.

[10] One reason BadgerNet costs are high is because they are postalized, which means they are the same statewide. This is advantageous in rural areas but in urban areas BadgerNet's costs are not competitive. Cable companies in particular are very aggressive in offering bandwidth at lower costs than BadgerNet.

[11] An additional $1.054 million in state Universal Service funds subsidizes access to BadgerNet for several UW campuses. (Background: Forty-eight states have some type of state Universal Service program. In nine states, including Wisconsin, this program helps subsidize school and library broadband costs. The state programs often complement the federal Universal Service program, which includes the E-rate. For more information see http://republicans.energycommerce.house.gov/Media/file/PDFs/2011usf/ResponsetoQuestion2.pdf.)

[12] TEACH applies for E-rate funding for every K-12 school and library on BadgerNet. The amount varies and for 2011 TEACH has requested $15.4 million. The E-rate program provides discounts to schools and libraries for telecommunication services (e.g., voice, broadband), Internet access and local networking. It is funded at $2.3 billion annually from the federal Universal Service Fund. Wisconsin schools and libraries receive about $40 million annually from the E-rate and TEACH is the largest recipient. Some TEACH funding is used to pay off interest on school wiring loans from a previous TEACH program.

[13] The TEACH rate chart is at http://teach.wisconsin.gov/category.asp?linkcatid=2603&linkid=619&locid=85.

[14] See the TEACH website for more information on the process to request a bandwidth increase.

[15] Because of chronic shortages in the TEACH budget dating back many years, 30% of Wisconsin's public libraries have an additional broadband circuit provided by a local cable company or a local telecommunications carrier. The local carrier providing the BadgerNet circuit is often the same carrier providing the additional broadband circuit at substantially less cost than the BadgerNet circuit.

access to sites offering video content because streaming video requires more bandwidth than the library has. For schools, this form of bandwidth self-censorship is an impediment to student learning because, like libraries, there are sites and services students (and teachers) want to use but cannot. All parties involved find the need to restrict access to content and the bandwidth allocation process frustrating. [16]

WiscNet

The UW and several private colleges and universities founded WiscNet in 1990, five years before BadgerNet. It is a not-for-profit, member-based cooperative that provides Internet access and a host of other services.[17] At its beginning, WiscNet was an association of public and private institutions which included the UW campuses and eight other private colleges and universities. It now has over 450 members including the technical college campuses, school districts, libraries, and state and local governments. WiscNet does not serve private sector businesses or residential households. When BadgerNet was created in the mid-1990s, very few telecommunication carriers provided Internet access. WiscNet then expanded its services beyond the academic community by allowing schools and libraries to become members.[18] Currently, 72% of the state's school districts and 95% of its public libraries are WiscNet members. Over 80% of schools and libraries use BadgerNet for their broadband connection to WiscNet. Therefore, BadgerNet and WiscNet are complementary services, not competitors.

Most Internet providers charge their customers based on how much bandwidth they use: The more bandwidth used, the higher the cost. WiscNet charges schools based on student enrollment and it charges library systems based on their percentage of state aid. Thus schools and libraries can increase their bandwidth to any level and their WiscNet costs remain the same. This is important because many school districts and regional library systems[19] using BadgerNet for their broadband are getting an increase to 100Mbps as a result of the BadgerNet contract extension referenced above. And from a more general perspective, the demand for ever greater bandwidth will likely continue. WiscNet was able to eliminate bandwidth as a cost factor because its cooperative model allows it to leverage the aggregate demand of its 450 members to negotiate very low costs for Internet transit service and other services too (e.g., filtering). Its many partnerships with other state and national advanced research and education networks further enhance its purchasing power.

Broadband Affordability

The holy grail of broadband is to have sufficient bandwidth at affordable costs. What is sufficient can often be determined by reviewing bandwidth usage data. What is affordable is more subjective and it is often an issue of bandwidth costs competing with costs for other school and library essential services in an environment of diminished budgets. Because BadgerNet reaches all communities in the state the issue is not access to sufficient bandwidth, rather, it is access to sufficient bandwidth *at an affordable cost.* In

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[16] In a survey the American Library Association conducted in November 2010, 54.6% of libraries nationwide reported they had adequate bandwidth but this figure was just 34.7% for Wisconsin libraries. See the Wisconsin data on p. 86 at http://www.ala.org/ala/research/initiatives/plftas/2010_2011/index.cfm.

[17] While a not-for-profit, WiscNet has a close relationship with UW-Madison, which is its biggest member. For example, its employees are UW-Madison employees and WiscNet contracts for services and pays for technical and network support from the UW-Madison's IT division. For a history of WiscNet, see http://www.wiscnet.net/the-history-of-wiscnet. A list of its services is at http://www.wiscnet.net/services. WiscNet is governed by an eleven member board of directors, elected by its members. Bob Bocher serves on the WiscNet board.

[18] Until 1995, the National Science Foundation controlled the Internet backbone and access was restricted primary to research and academic institutions.

[19] There are 17 regional library systems in the state (http://dpi.wi.gov/pld/wisysdir.html). All systems manage WANs that connect their individual member library BadgerNet circuits in a hub-and-spoke network topology. Some systems have fifty or more libraries (spokes) on their WAN. The system's BadgerNet circuit (hub) must be fairly large to accommodate all the traffic from their member libraries.

seeking affordable broadband capacity outside of BadgerNet there are several alternatives and options[20] that schools and libraries use. For example:

- The Brown County Public Library uses the county's own fiber network to connect its main library in Green Bay and most of its branch locations in other areas of the county.
- Some of the schools and libraries in the Oshkosh, Neenah and Menasha areas get their broadband from FoxNet, a community area network (CAN) founded in the late 1990s.
- The L.E. Philips Public Library in Eau Claire gets 80Mbps for $1,900/annually from the Chippewa Valley Internetworking Consortium (CINC). (The BadgerNet cost for 80Mbps is $29,000/annually).
- The Milwaukee public school district and the Milwaukee public library get their broadband from Time Warner Cable.[21]
- Over 150 school districts and libraries currently get some or all of their broadband from Charter Communications. For example, Menominee Public Library recently cancelled its 1.5Mbps BadgerNet circuit ($100/month with TEACH subsidy; $460.90 without) and now has a 16Mbps circuit from Charter for $88/month. (This is ten times the capacity at one-fifth the BadgerNet contract cost.)

From an academic perspective, the UW system has worked with other providers to obtain broadband for some of its campuses outside of BadgerNet. This is done primarily to save money and to have more control over network deployment and management. If all UW campuses used BadgerNet they would pay approximately $13 million more each year for bandwidth than they are currently paying.[22]

The need for affordable access to significant broadband capacity—and the inability of BadgerNet or the commercial sector to always meet this need—has resulted in an interest among community anchor institutions[23] to be more proactive in addressing their broadband needs. This, in turn, has sparked more interest in the development of community area networks (CANs).[24] CANs are not new and several have existed for over a decade, including FoxNet and the Chippewa Valley Internetworking Consortium (CINC), both referenced above. Established in 1999, CINC[25] has fiber connecting more than 150 community anchor institutions in the Eau Claire area. (CINC does not serve for-profit businesses or residential households.) While CINC owns all of its own optical fiber facilities, it connects to all major telecommunication carriers in the Chippewa Valley area including AT&T, CenturyLink, and Charter. CINC members purchase a number of services from these carriers too. Furthermore, both initial and ongoing fiber construction projects are often shared between CINC and the carriers to the mutual benefit of both. As its FAQ states:

> CINC is a role model community area network that utilizes inter-governmental agreements and memorandums of understanding. As a community area network with minimal fees (for fiber locates, support and network maintenance), the broadband speed and connectivity greatly exceeds that of any private provider. Unlike other models, CINC members own and direct their future.

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[20] For more details on bandwidth options and the E-rate, see the DPI paper Bandwidth Options and the 2012 E-rate Application Cycle.

[21] In part because of BadgerNet's postalized rate structure (see note #10), its bandwidth costs in urban areas are not competitive. Also, in some areas of the state carriers that are part of BadgerNet will offer schools and libraries bandwidth at costs lower than the BadgerNet contract costs.

[22] The two largest campuses (Madison, Milwaukee) have need for very high capacity bandwidth and neither is on BadgerNet. At any given time UW-Madison has 4Gbps in Internet traffic coming into or leaving campus, with peak bandwidth usage of more than 20Gbps.

[23] Community anchor institutions include schools, higher education, libraries, municipal government, other public sector entities and not-for-profit organizations that have a community service mission.

[24] CANs can be viewed as modern day "cooperatives" where community anchor institutions with common interests and issues pool their resources to address those interests and issues. Related to this, the interest in CAN's has stimulated discussions among community anchors about the sharing of other services too.

[25] The CINC FAQ is at https://cinc.uwec.edu/CINC_FAQs.pdf.

For the past several years the development of CANs has been of particular interest to UW-Extension (UWEX). As part of its public service mission, [26] UWEX has a long history of promoting local community and economic development. As access to sufficient and affordable broadband has become essential to such development, the UWEX has an obvious interest in helping ensure that community anchor institutions have such access.[27] This interest took on greater importance with passage of the American Recovery and Reinvestment Act (ARRA, the federal stimulus act) in February 2009. This act included $4.7 billion in competitive grants to provide or enhance broadband to unserved areas of the country. In Wisconsin several grants were submitted, and subsequently awarded, to address broadband access by community anchor institutions. Here are brief summaries of these grants: [28]

- *BadgerNet Fiber Grant:* Submitted by DOA, this $23 million grant was to bring fiber to 467 schools and libraries on BadgerNet that still had old, limiting copper circuits.[29] The grant would have provided school districts and library systems with 100Mbps for $250/month, and each library 20Mbps for $100/month (subsidized by TEACH). The grant was awarded in February 2010, but citing "irreconcilable federal regulatory hurdles" DOA—in agreement with the carriers—declined the grant in February 2011.[30]

> The grant would have provided every library with 20Mbps for $100/month. TEACH now does not have the funds to get all our libraries to even 5Mbps for $100month.
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> "The carriers fully supported the DOA decision to return the grant. This decision cost Wisconsin a great opportunity to provide fiber broadband to all schools and libraries on BadgerNet."
>   –State Superintendent Tony Evers

- *Metropolitan Unified Fiber Network (MUFN).* Submitted by the UW System, this $5 million grant will deploy more than 100 miles of fiber in the greater Madison area. It will provide high-capacity broadband to 100 anchor institutions at speeds up to 10Gbps. The grant was awarded in March 2010.

- *Building Community Capacity Through Broadband.* Submitted by UWEX, this $30 million grant will focus on building CANs in three communities (Platteville, Superior, Wausau) and enhancing the existing Eau Claire area (CINC) CAN. These CANs will connect 182 anchor institutions with high-speed broadband at very affordable costs. While ongoing costs will vary by CAN and are still under discussion, it is likely that many sites will be able to get 1Gbps for less than $10,000/annually. (The current BadgerNet cost for 1Gbps is $139,824/annually.) The UW is partnering with CCI Systems, a commercial telecommunications carrier.[31] WiscNet will use its engineering expertise to assist in building these CANs. The grant was awarded in August 2010.

- *Building Community Capacity Through Broadband – Sustainable Broadband Adoption (SBA).* Submitted by UWEX, this $2.4 million dollar grant will focus on education and marketing efforts to help communities understand the benefits of broadband and to increase broadband subscribership levels with private providers. The grant was awarded in August 2010.

The three UW grants will provide broadband and Internet service to community anchor institutions, not private businesses or residential households. However, an important purpose of the grants—from both the UW and national perspectives—is to encourage public-private partnerships. To further this purpose, telecommunication carriers will have access to the fiber installed as part of the grants to provide services

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[26] In part, its mission states, "UW-Extension supports the University of Wisconsin System mission by providing strong leadership for the university's statewide public service mission." Dating from over one-hundred years ago Wisconsin pioneered the university extension movement, which is a cornerstone of the Wisconsin Idea. See http://www.uwex.edu/about/uw-extension-mission.html.

[27] As the UW has become more involved in responding to community interest in CANs the telecommunication companies claim that it is violating the statutory restrictions passed in 2005. This is the legal rationale for the lawsuit filed by Access Wisconsin against the UW on July 22. This is addressed in more detail below.

[28] For more information on ARRA broadband funding and the grants briefly described here, see the DPI's website at http://dpi.wi.gov/pld/arrabbfunding.html.

[29] Copper circuits have a bandwidth limitation of about 10Mbps-20Mbps. Above this range fiber optic cable is the preferred medium. Fiber, with its almost unlimited capacity, builds for the future.

[30] See the DOA letter to the federal grant agency at http://dpi.wi.gov/pld/pdf/bcngrantdeclined.pdf. In addition to rejecting the grant, the letter extols the virtues of providing broadband over legacy copper circuits.

[31] When writing the grant the UW sought partnerships with any carrier in the state. Only CCI responded.

to the private sector. And even while the carrier's lawsuit against the UW was still pending (see below), several rural telecommunication carriers expressed interest in access to the fiber. From a national perspective, sharing fiber and interconnecting to other carriers' networks is a grant requirement. It was this requirement that DOA cited as "irreconcilable federal regulatory hurdles" when it declined the BadgerNet fiber grant.[32] The UW and CCI Systems did not find the regulatory hurdles too difficult to overcome.

The federal Recovery Act also directed the Federal Communications Commission (FCC) to develop the nation's first *National Broadband Plan* (NBP, referenced on page 1). One of the plan's major goals is to ensure that community anchor institutions—including schools and libraries—have affordable access to 1Gbps broadband service. Furthermore, chapter 8 in the plan recognizes the expertise of state research and education networks, like WiscNet, and it recommends that they expand their services to connect other community anchors.[33] Thus the UW and WiscNet's interest in developing CANs dovetails with the recommendations in the *National Broadband Plan*. A recent paper authorized by the Bill & Melinda Gates Foundation also found substantial benefits in leveraging the knowledge of state research and education networks to help library broadband connectivity.[34] Until the availability of ARRA's broadband grants and completion of the plan, the federal government relied primarily on the telecommunication carriers to meet the nation's broadband needs. If the carriers successfully addressed this need, there would be no need to look for other options.[35]

> R&E networks can provide high-speed, high-quality connectivity to public libraries at a low cost. These networks create opportunities for member institutions to share best practices, content, and programs.
> –Gates Foundation report

Recent Developments

The move to broadband represents a major change—and challenge—from the telecommunication carriers' historic reliance on income from plain old (voice) telephone service (POTs). There is a steady decline in landline phone service in favor of cell service and broadband voice services, like Skype.[36] Thus the carriers realize that broadband is a major source of their future business and they will take whatever actions necessary to protect that business. In this regard the carriers have long viewed the UW and WiscNet as inappropriately intruding in their market, and the CAN grants significantly increased the carrier's angst. Access Wisconsin[37] expressed its concern in a June 7, 2011, press release: "We take great offense at the idea that taxpayer money should be used to subsidize a government agency such as UW-extension to duplicate and compete with our

> "Our K-12 schools and libraries exist to educate our children and address the information needs of the public. They do not exist to guarantee the profitability of any private sector firm nor do they exist to guarantee the viability of any not-for-profit firm."
> –Bob Bocher, DPI

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[32] The WBAA did not want to be required by the grant to lease fiber to their competitors or to make the required interconnects. According to the federal grant administrator, nationwide the broadband grants have resulted in over ninety different interconnection agreements between telecommunication carriers and other providers.

[33] To help carry out this recommendation in the plan, Internet2 has initiated a U.S. Unified Community Anchor Network (UCAN) program to use the expertise of the R&E networks to assist other community anchors to get affordable broadband. See http://www.usucan.org.

[34] *Connections, Capacity, Community: Exploring Potential Benefits of Research and Education Networks for Public Libraries*. A study commissioned by the Bill & Melinda Gates Foundation, February 2011. (http://www.shlbc.org/sites/shlbc.org/files/Connections%20Capacity%20Community%20RE%20Network%20Paper%2021feb11.pdf.)

[35] The FCC recognized the inability of the marketplace to always address broadband needs in its Sixth E-rate Order, released September 2010. Previous to this Order only carriers could provide fiber to a school or library. This Order allows any entity to provide fiber. See http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-175A1.pdf.

[36] AT&T stated this succinctly in a December 2009 filing with the FCC: "With each passing day more communications services migrate to broadband, leaving plain-old telephone service (POTS) as relics of a by-gone era. With an outdated product, falling revenues, and rising costs, the POTS business is unsustainable for the long run." See http://fjallfoss.fcc.gov/ecfs/document/view?id=7020354032.

[37] Access Wisconsin is an association of the state's smaller telecommunication carriers.

services. This is wasteful and inappropriate."[38] Access Wisconsin also states that in some communities the school district is the carrier's largest customer—implying that the district should feel some type of obligation to remain a customer even if it means paying more for less service. (Under the DOA Internet contract, many providers charge more than four times what WiscNet charges.) Furthermore, the carriers claim that WiscNet's school and library members deprive them of revenues they need to buildout their networks. Information from the Public Service Commission shows that in 2010 Wisconsin's carriers (but not AT&T which services primarily urban areas) had revenues of just over $1.5 billion. In 2010 WiscNet had revenues of $2.8 million from its school and library members. This is less than two-tenths of 1% of the carriers' revenues. Therefore, even if all schools and libraries received Internet access from a carrier, it will have almost no impact on their revenues—unless they plan to substantially increase the cost of Internet access.

In an attempt to protect their market by legislation the telecommunication carriers—as they did in 2004 and 2005—again successfully lobbied the legislature to take action. As a result, in early June 2011 the Joint Finance Committee (JFC) passed a motion—with no public hearing, notice, or input—to amend the state's biennial budget bill to: (1) Prohibit the UW from participating in the three broadband grants, (2) require the UW to sever its close relationship with WiscNet, and (3) require the Legislative Audit Bureau (LAB) to conduct an audit of the UW's use of telecommunications and its relationship with WiscNet.

> This legislation will end over 15 years of fostering a collaborative association between higher education, schools and libraries. We need to continue fostering such associations, not eliminating them."
> – Superintendent Tony Evers, June 2011
> ____
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> To force a school or library to remain a customer—or become a customer—of any firm that delivers less service at greater costs is a clear misuse of tax dollars.   – DPI legislative testimony, March 2012

After considerable objections from the UW and the broader education and library communities the budget bill that passed[39] allows the UW to proceed with its grants, delays the required UW separation from WiscNet until July 1, 2013, and mandates the LAB to complete its audit by January 2013.[40] Legislation was introduced in early 2012 to extend the UW – WiscNet separation date to July 1, 2014. This one year extension would have provided more time to review and possibly implement any audit recommendations and it would have allowed time for all parties to have an open discussion on this issue, as suggested on page 1 of this paper. DPI and the library and education communities supported this legislation; the carriers opposed it. While the bill passed key legislative committees, legislative leaders never scheduled the bill for a vote before the legislature adjourned in March.

To meet the required UW – WiscNet "separation" date of July 1, 2013, the WiscNet board has created an ad hoc committee to determine what actions are needed to comply with the law. As of May 2012 the committee is proceeding with its charge and is confident it will have a structure in place by July 2013 to meet the requirements of the law and allow WiscNet to continue providing services long past this date.

For Further Information

If you have any comments or questions on this paper, or for further information, please contact: Bob Bocher, 608-266-2127; robert.bocher@dpi.wi.gov.

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[38] In relation to taxpayers subsidizing a service, Access Wisconsin does not mention that its members and other carriers receive $24 million annually in TEACH subsidies or that in 2011 Wisconsin carriers received $136 million in direct federal telecommunication subsidies (see http://www.usac.org/hc/tools/disbursements/default.aspx.) Both subsidies are ultimately paid by taxpayers.

[39] Shortly after the budget passed in June, Access Wisconsin filed suit against the UW and WiscNet. The carriers claimed the UW did not have the legal authority to participate in the broadband grants. In November the court ruled in favor of the UW and WiscNet and dismissed the suit. (On the legal authority of the UW to participate in the grants, see http://wire.wiscnet.net/wp-content/uploads/2011/06/Letter-from-UW-System-Legal.pdf.)

[40] See pages 194 and 520 in the budget act (2011 Act 32) at http://legis.wisconsin.gov/2011/data/acts/11Act32.pdf.

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Appendix A:

Glossary

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Below are some brief definitions or descriptions of several key terms, programs and parties referenced in this paper.

- *Access Wisconsin:* An association representing mostly the state's smaller telecommunication carriers. Access Wisconsin members, along with larger carriers like AT&T, provide the broadband circuits and requisite network infrastructure for BadgerNet. Access Wisconsin members are part of the WBAA (see below). (http://accesswis.com)

- *BadgerNet:* Statewide broadband network provided under a Department of Administration (DOA) contract by a consortium of telecommunication carriers known as the WBAA (see below). AT&T is the prime vendor. 97% of BadgerNet sites are either heavily subsidized by TEACH or are state agency sites, which must use BadgerNet.
(http://www.doa.state.wi.us/section_detail.asp?linkcatid=308&linkid=119&locid=155)

- *Broadband:* The speed or the capacity of the connection. Using the highway analogy, high speed broadband is analogous to a multi-lane freeway and low capacity is a narrow path. The FCC has set a broadband benchmark of 4Mbps.[41] Internet providers use a customer's broadband connection to provide access to content (e.g., email, web, video), access to Internet-based (cloud-based) applications and services, etc.

- *Community Anchor Institutions (CAI):* Refers to schools, higher education institutions, libraries, municipal government, and other not-for-profit organizations that have a community service or outreach mission.

- *Community Area Network (CAN):* A consortium of community anchor institutions that pool their resources to provide high-speed broadband and Internet services at affordable costs. The collaboration and cooperation that CANs foster often results in the sharing of other services and resources too.

- *E-rate:* A program from the Federal Communications Commission that provides K-12 schools and public libraries with 20% - 90% discounts on their telecommunications and Internet costs. (http://www.usac.org/sl.)

- *TEACH:* Part of DOA, TEACH spends $24 million annually in subsidizing access to BadgerNet for school districts, private K-12 schools, public libraries, private academic institutions and technical colleges. The subsidy comes from the state Universal Service program and the federal E-rate program. (http://www.teachwi.state.wi.us)

- *WBAA – Wisconsin BadgerNet Access Alliance:* The consortium of over seventy telecommunication companies that provide, under contract to DOA, the circuits and underlying networking infrastructure for the BadgerNet network.

- *WiscNet:* A not-for-profit membership organization that provides Internet access and many other services to community anchor institutions—mostly higher education, K-12 schools and libraries. (http://www.wiscnet.net/)

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[41] In July 2010, the FCC stated, "We benchmark broadband as a transmission service that actually enables an end user to download content from the Internet at 4 Mbps." This benchmark is targeted at household Internet access. Community anchor institutions need much more bandwidth than the average household. See p.8 in the *Sixth Broadband Deployment Report* at http://transition.fcc.gov/Daily_Releases/Daily_Business/2010/db0720/FCC-10-129A1.pdf.

In addition to basic Internet access, bandwidth on BadgerNet can be used for several different purposes as described below. Many schools and libraries use a combination of these depending on what services or applications they need.

- *HPLL:* High priority – low latency. This is used when a particular service or application requires priority (e.g., high Quality of Service–QoS) over other types of services or applications. For example, in schools HPLL is often used for voice over IP (VoIP) and for classroom video. Libraries often use HPLL to ensure that transactions from their integrated library system (online catalog and automated circulation system) are given preference over generic Internet access. When the bandwidth reserved for an HPLL service is not needed, it can be used for other purposes. HPLL is only used within the BadgerNet network. That is, no packets with an HPLL marker are transmitted to the public Internet.

- *ITP:* Internet transport. This is used for regular access to the Internet. (Sometimes referred to as "commodity" access.) No special treatment is accorded this bandwidth. It uses the Internet's standard "best effort" protocols to deliver information in a timely manner.

- *Video:* This is the traditional interactive, full motion classroom video that school districts and other education institutions have been using for many years. Interactive video of this type requires high QoS. To help ensure this quality the service uses a dedicated 6Mbps bandwidth per video site. When the 6Mbps is not being used for video, it is not available for other purposes. Most of these sites are part of a regional video network affiliated with WADEN (Wisconsin Association of Distance Education Networks, http://www.uwex.edu/disted/waden).

- *Video Bridging:* This is often used for mobile classroom video where the equipment is on a rolling cart. When the bandwidth reserved for bridging is not needed, it can then be used for other purposes. (To help ensure high QoS, video bridging uses HPLL.)

- *WAN:* Wide area network. This is most often used to connect individual schools to a district central site. Libraries use this to connect individual libraries to a regional library system headquarters. The district or library system then aggregates all the school/library WAN sites and connects to the Internet via the district's or library system's ITP bandwidth. This is often referred to as a "hub-and-spoke" arrangement where individual schools/libraries are the spokes and they all connect to a central "hub" which is a district central site (e.g., high school, district office) or the regional library system headquarters. This central, aggregated BadgerNet circuit must have the capacity to accommodate all the individual BadgerNet WAN circuits coming from each school or library.