



BadgerNet*



Wisconsin's Statewide Telecommunications Network

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Background

Wisconsin has long been a leader in distance education, with full-motion (45Mbps) video networks available in much of the state as far back as the 1970s. These networks were used for distance education, primarily by our K-12 schools and two-year technical colleges. By the early 1990s there was more than 8,000 miles of fiber in the state, and 60% of the state's 426 K-12 school districts were members of regional video networks.

In 1993, then-governor Tommy Thompson established a Blue Ribbon Task Force to investigate the establishment of a statewide network for educational institutions and government agencies. The task force was charged with:

- Developing a statewide telecommunications infrastructure vision for Wisconsin and identifying barriers to the realization of that vision
- Identifying participants and stakeholders in the development of the telecommunications infrastructure
- Assessing the networking needs and expectations of participants and stakeholders
- Documenting the value and benefits of a modern telecommunications infrastructure
- Recommending changes in state statutes and public policy to remove barriers to the realization of the vision of a modern telecommunications infrastructure

The State Library was represented on the task force, and public libraries are specifically included by the statutes that define who can access the network.

BadgerNet

The outgrowth of the task force report was legislation passed in 1995 creating BadgerNet (<http://www.doa.state.wi.us/badgernet>). This was followed shortly thereafter by legislation creating the TEACH (Technology for Educational ACHievement) program. TEACH had an early initiative for wiring schools and libraries, and it used state universal service funds to heavily subsidize access to BadgerNet for K-12 schools, public libraries, and regional library systems. Schools and libraries were—and still are—charged \$100/month for access up to 1.5 Mbps. The cost for circuits between 1.5 and 45Mbps varies from \$250 to \$500/month. For some libraries this cost is paid by their regional library system. Over 98% of our school districts and public libraries are on BadgerNet.

BadgerNet covers all areas of the state, and the network provides backbone, middle, and last-mile connectivity. When Ameritech (now AT&T) received the initial BadgerNet contract in 1995, it was required to work with all local phone companies to ensure statewide network availability. Thus, although Wisconsin has 90 local exchange carriers, there are no problems getting access to BadgerNet even in small, rural communities.

In 2001 a detailed planning process, which involved the State Library, started on the second generation of BadgerNet. A report titled *Wisconsin Educational Network* was published in September 2002. This report

* This paper was prepared for the American Library Association's preconference on Telecommunication Advocacy, held June 21, 2007, just before the ALA annual conference. Bob Bocher is on the ALA's Office for Information Technology Policy's Advisory Committee and he chairs its Telecommunications Subcommittee.

proposed a plan to provide a vendor-procured network to approximately 2,400 data and/or video sites including state agencies, schools, colleges/universities, and public libraries. Following a competitive bid process, in March 2005 the network office in the state's Department of Administration signed a contract with AT&T as the prime vendor to provide services for a statewide enterprise network designed to converge voice, video, and data onto one IP MPLS (Multi-Protocol Label Switching) network. Between January and September 2006, 411 library circuits were converted to the new BadgerNet Converged Network (BCN). For public libraries, the conversion was coordinated by the State Library working directly with BCN staff and networking staff in the 17 regional public library systems. Here are some other BadgerNet facts:

- The BCN network staff provide a 24/7 help desk, and support is provided through the router in the library. In addition, many library systems provide their members with internal library LAN and desktop workstation support.
- All 17 regional library systems in the state manage WANs for their member libraries. The WANs are part of the regional network infrastructure that connects to the BadgerNet backbone at 4 locations in the state. WANs are used primarily for shared integrated library system traffic and Internet access.
- In addition to using \$3.3 million in state universal service funds to subsidize BadgerNet circuit costs for libraries, the state network office receives \$6.9 million annually from the federal E-Rate program.
- BadgerNet is governed by a 15-member BadgerNet Advisory Council. A representative from one of the regional library systems is on the council, in addition to a State Library representative. The council has already started looking at network needs for the next generation of BadgerNet. (The current contract expires in September 2010.)

WiscNet

BadgerNet is the state's telecommunications network; it does not provide Internet service. Most BadgerNet users (e.g., state government, schools, and libraries) receive their Internet access via WiscNet (<http://www.wiscnet.net>)[†]. WiscNet started providing Internet access in 1991 to 26 colleges and universities in the state. When the first BadgerNet network was built in the mid-1990s, WiscNet expanded its services to include K-12 schools and public libraries. WiscNet is a not-for-profit association under the auspices of the UW–Madison. It is governed by a Board of Directors representing member institutions. For public libraries in the state, the average annual membership in WiscNet is about \$450. Many libraries have this fee paid for by their regional library system.

Bandwidth Issues

Library bandwidth on BadgerNet varies from 512Kbps for our smallest library to over 20Mbps for library systems. Until recently, many small libraries with 2-3 workstations found a 512Kbps circuit to be adequate. But most libraries are now providing wireless Internet access, and the more interactive Web 2.0 environment (e.g., video, interactive gaming) also is placing additional stress on bandwidth. Finally, the subsidy from the state's universal service fund, which pays for most of a library's BadgerNet circuit, has not increased for several years. As a result of all these factors, in the summer of 2006 the State Library started getting complaints from libraries about insufficient bandwidth. Fortunately, language is pending in our 2007-09 state budget to increase funding for schools and libraries. (*February 2008 update:* The 2007-09 budget did include additional funding authority to increase BadgerNet subsidies. By April 2008 over 70% of public libraries in the state will receive a bandwidth increase, most at no additional cost. With this upgrade all libraries will have a minimum of a 1.5Mbps circuit.)

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[†] Several other ISPs, besides WiscNet, now also offer Internet service via BadgerNet, but WiscNet is still the ISP for most K-12 schools, libraries and higher education.