

WISCONSIN

EDUCATIONAL NETWORK

Executive Summary



Life



Long



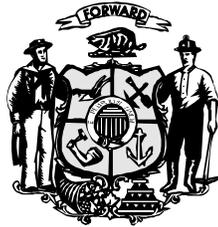
LEARNING



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September 16, 2002

The Honorable Scott McCallum, Governor, State of Wisconsin
And Members of the Wisconsin State Legislature

On behalf of the Wisconsin Educational Network Collaboration Committee (WENCC), we are pleased to present the WENCC Business Case. The business case was developed to facilitate the decision-making process that will result in the next crucial step in the evolution of the Wisconsin education community's technology process—installing a Wisconsin Distance Education Network.

In September 2001, WENCC was formed to evaluate the current and long-term educational technology needs of PreK-20 Wisconsin classroom educators and our librarians. WENCC's mission was to develop options to address the expiration of the BadgerNet Video Network contract in December 2005; develop recommendations based on the needs of users on the existing video network; and recommend a solution to support collaboration among Wisconsin's educational community, PreK-12 to the higher education institutions and libraries. The committee is comprised of the following members:

Mr. Ray Allen, Executive Director, TEACH Wisconsin (Chairperson)
Ms. Elizabeth Burmaster, WI State Superintendent of Schools, Department of Public Instruction
Dr. Richard Carpenter, President, WI Technical College System
Mr. Thomas Fletemeyer, Executive Director, WI Educational Communications Board
Dr. Katharine Lyall, President, University of Wisconsin System
Ms. Rebecca Heidepriem, CIO/Secretary, Department of Electronic Government
Dr. Rolf Wegenke, President, WI Association of Independent Colleges and Universities

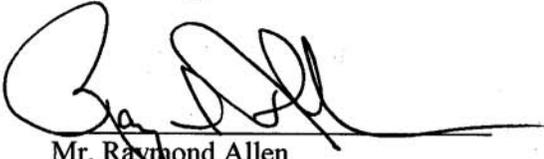
Hundreds of educators throughout the state were personally involved in face-to-face, facilitated focus groups to gather data, which was compiled and analyzed. Over 17% of the State's public school teachers responded to a survey produced by WENCC that questioned them about their technology needs, and their thoughts on the value of educational technology.

This business case is proposed based upon funding sources that are currently associated with state educational technology programs. It does not ask for additional General Program Revenue (GPR) increases to implement the plan. However, it does request a commitment to sustain that funding. The current program is primarily funded through Segregated (SEG) funding. While no costs will be incurred until December 2005, the time required to complete the procurement and implementation of a Wisconsin Educational Network is approximately 36 months.

The collaborative and cooperative process used by WENCC to develop this business case is a landmark in the Wisconsin educational planning process, and we believe it is a model for national educational technology planning. Each agency and educational institution involved on the committee worked toward a common goal. Each entity brought its ideas and concerns to the table, but always with the objective of creating a final product that ultimately met the needs of and benefited the citizens of the State of Wisconsin.

We support the findings and recommendations of this business case and ask for your support to continue the documented progress you are about to review. We are available to answer any questions you may have. Thank you for your consideration.

Respectfully,



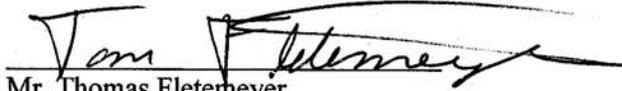
Mr. Raymond Allen
Executive Director
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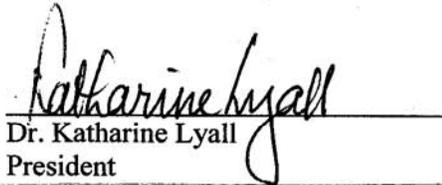
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President
WI Technical College System



Mr. Thomas Fletemeyer
Executive Director
WI Educational Communications Board



Dr. Katharine Lyall
President
University of Wisconsin System



Ms. Rebecca Heidepriem
CIO/Secretary
Department of Electronic Government



Dr. Rolf Wegenke
President
WI Association of Independent Colleges and
Universities

Please Read This First

This Wisconsin Educational Network Business Case is divided into **THREE** (3) documents – the business case summary, the business case details, and the business case appendix. Details of each section are as follows:

Document I: Wisconsin Educational Network Business Case Executive Summary

This brief document provides a summary of all of the information contained in the business case details. This information is primarily for the reader that wants an overview containing the key facts in order to make a decision.

Document II: Wisconsin Educational Network Business Case Details

This document provides a detailed version of the information provided in Document I. This is designed to provide the reader with more detailed information about the entire business case, logic for the recommendations, and the many relevant issues impacted by a strategic statewide business case.

Document III: Wisconsin Educational Network Business Case Appendix

This document contains reports, interview notes, surveys, raw data, and other pertinent documents and information that the committee gathered to develop the business case. It is provided to substantiate information and provide detailed information for readers wishing to see core data and information.

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Wisconsin Educational Network Collaboration Committee (WENCC)

Executive Summary September 16, 2002

Wisconsin Executive Collaboration Committee

- Chairperson: Mr. Ray Allen Executive Director, TEACH Board
- Ms. Elizabeth Burmaster, Wisconsin State Superintendent of Schools, Department of Public Instruction (DPI)
- Dr. Richard Carpenter, President, Wisconsin Technical College System (WTCS)
- Mr. Thomas Fletemeyer, Executive Director Wisconsin Educational Communications Board (ECB)
- Dr. Katharine Lyall, President, University of Wisconsin System
- Ms. Rebecca Heidepriem, CIO/Secretary, Department of Electronic Government (DEG)
- Dr. Rolf Wegenke, President, Wisconsin Association of Private Colleges and Universities (WAICU)

The Wisconsin Executive Collaboration Committee was initially formed in 1998 when the TEACH Wisconsin Board began operation. TEACH Wisconsin is statutorily charged with facilitating the use of technical standards, specifications, and technologies to ensure participation with other networks.

The committee has addressed a number of Wisconsin PreK-20/Library issues since its inception. It commissioned the Wisconsin Educational Network Collaboration Committee in September 2001.

Wisconsin Educational Network Collaboration Committee (WENCC)

Charge

The State of Wisconsin enterprise video and data networks support in excess of 800 educational network connections for school districts, libraries, and higher education institutions (both public and private). This is Wisconsin's education community — which could well be the State's largest, single industry. It is essential that a State of Wisconsin Educational Network continue to support the needs of this community with no interruption of services. The alternative (no access to distance education) could be devastating to the students all over the state.

In September 2001, the Executive Collaboration Committee commissioned the Wisconsin Educational Network Collaboration Committee (WENCC) to:

- Evaluate options to replace the BadgerNet Video Network contract that expires on December 5, 2005;
- Conduct a needs assessment to determine which educational technology applications (teaching tools) should be supported today and in the classroom of 2010;
- Make recommendations to facilitate PreK-20/library collaboration and connectivity among all Wisconsin educational institutions; and
- Write a business case with recommendations to be presented to the Executive Branch and Legislature by September 2002.

Vision

Create a seamless, flexible, high-quality educational technology network that will serve all Wisconsin learners equitably through 2010 and beyond.

Mission

Ensure the highest levels of instructional interoperability among Wisconsin PreK-20 educational entities and public libraries by creating an open forum for discussion, research, and the timely development of strategic recommendations to implement a statewide infrastructure that will accommodate emerging distance education technologies that enhance teaching and learning for all Wisconsin residents.

Goals

- 1) Develop a grounded, realistic recommendation for a Wisconsin Educational Network that supports education beyond 2010.
- 2) Discover the formal classroom educator needs.
- 3) Determine informal student-at-a-distance, anywhere, anyplace, anytime educational needs.
- 4) Ascertain the institutions' educational mission needs.
- 5) Identify for the Executive Stakeholders and Legislature:
 - a) the sense of change and value of technology seeded by public policy educational technology funding when leveraged with the investments of public and private institutional operating budgets; and
 - b) the facts necessary to facilitate commitment of continued public policy funding of educational technology and educational telecommunications access.
- 6) Protect the current Wisconsin educational technology infrastructure investment and build upon the solid foundation created by the stakeholders.
- 7) Procure and install a Wisconsin Education Network that can be used as a viable technology option for use by Government Entities, the Community and Business training.

Charge 1: Evaluate Options

The Legislature currently provides public policy funding (TEACH Programs) subsidizing the video education and Internet access BadgerNet networks. The 2002-03 budget is \$15,927,700. These are segregated funds (SEG) funds and assessments made from the Universal Service Fund (USF). These are not general purpose revenue (GPR) funds. The current state contracts require annual payments through 2005.

The State of Wisconsin has three basic options:

- 1) Procure a new contract
- 2) Extend the current contract
- 3) Do nothing

Under all three alternatives, the Legislature must make a decision about sustaining the current level of funding. For example, the current video network contract could be extended. It would require a major upgrade and the vendor requires a three (3) year contract extension with a minimum estimated cost of \$28,000,000. The WENCC committee has determined that upgrading and extending this contract would not meet our Wisconsin educators' universal needs for a PreK-20/library lifelong learning network.

Should the Legislature **not** subsidize the educational network, the Wisconsin educational community receiving public policy funding, and educational institutions directly purchasing educational network services from the state (the University of Wisconsin and the Wisconsin Technical College Systems) will need the next three years to prepare for the end of funding.

Funding either to extend or replace the current education network(s) must be committed contractually in the 2003-04 biennium. If this commitment cannot be made, some educational users will need to create their own statewide networks and find a way to pay for them. On the other hand, others, particularly PreK-12 schools (both public and private), may be unable to fund their own connectivity and will be excluded from participation in distance education.

Charge 2: Conduct a Needs Assessment

“Teachers, instructors, professors and librarians are highly aware of educational technology, use it, value it, and want to use it even more.

“Public Policy Funding of educational technology and services coupled with the funding provided by the Wisconsin educational community (public and private PreK-12, the University of Wisconsin and the Wisconsin Technical College Systems, Cooperative Educational Service Agencies (CESAs), the Wisconsin Educational Communications Board, the Wisconsin Association of Independent Colleges and Universities, and Public Libraries) through their own capital and operational budgeting, is absolutely making a positive impact on education and instruction for our traditional student populations and adults.

“For example, where many may have assumed that the teachers in the last quarter of their careers are reluctant to use technology, our Teacher Survey of 9,036 teachers substantiates just the opposite. Across the board, educators use, value and want more technology involved in teaching students. They also identify a whole host of under-served traditional student groups and emerging groups of non-traditional students that can be served.” (WENCC reflecting on results from Teacher Survey.)

WENCC's goal of facilitating the highest levels of instructional interoperability between Wisconsin's PreK-20 institutions and public libraries was complex. The strategy was to gather information on the educators' functional needs through open forums for discussion and research. This input would form the basis for timely strategic recommendations to implement a statewide infrastructure accommodating emerging technologies and supporting access for any Wisconsin student regardless of age or location.

In addition to the charges, the working committee determined it was important to document what progress was being made and what value or impact the quarter of a billion dollars of public policy funding was having on Wisconsin educators and students. While we cannot measure the effect of the investment on student outcomes, we can measure use, value, change and awareness of educational technology. The Executive and Legislative branches need these facts to make decisions about the continuation of funding to the Wisconsin Educational Network(s).

Findings

After six months of focus groups, surveys and interviews to gather information from educational and government communities, WENCC compiled the results of its needs assessment. There were seven common themes for all of the groups. The seven themes are:

- 1) A standards-based, affordable network with adequate bandwidth that can support multiple applications and provide universal connectivity is critical to accommodate increasing demand as use of the Wisconsin Educational Network continues to grow.
- 2) The quality of education in Wisconsin should not depend on economics or geography.
- 3) Professional development for teachers in the effective use of instructional technology and its incorporation into curriculum is critical to maximize the investment in educational technology by increasing competency and comfort in its use.
- 4) PreK-20 Educators and librarians that use BadgerNet Video Network distance education classrooms (approximately 350 sites) will need continued support for this specific application.
- 5) Continued state investment and funding is essential.
- 6) A network must be installed that will provide access to learners of all ages throughout the state and open the world and a host of content providers to each and every learner.
- 7) Lifelong learning will provide a skilled workforce for statewide economic development as Wisconsin competes in a global economy.

Charges 3 & 4: Make Recommendations and Write a Business Case

The process to establish this Business Case is a collaborative landmark in Wisconsin educational community planning. The partners represent every educational and government sector that is a current stakeholder. This is a solid partnership in collaborative educational planning based upon the grassroots needs of the PreK-20 classroom educator and librarian as well as state agencies and special interest groups. Our Wisconsin classroom teachers, 9,036 (greater than 17% of all Wisconsin public school teachers) eagerly responded to a voluntary survey asking what they think and what they need.

The seven recommendations of this business case that the Wisconsin Executive Collaboration Committee approved are:

- 1) Procure a standards-based Wisconsin Educational Network with adequate bandwidth to support academic curriculum/training and administrative needs of educational institutions including public libraries, state and municipal governments, as well as the private sector, non-profit and community organizations for training and educational purposes.
 - a) All users should have access to a common platform. The technology chosen must serve educational needs, be ubiquitous, and flexible.
 - b) The network should be extended to the building level or a primary distribution point in each district and/or on each campus. It should provide seamless connectivity between all Wisconsin educational institutions, public libraries, and municipal governments.
- 2) Continue to support expansion of access to educational technology to enhance equitable educational learning opportunities for all Wisconsin residents regardless of where they live or their economic status.
- 3) Recommendation number three is twofold:
 - a) Appoint and charge a Wisconsin Educational Network Professional Development/Instructional Technology Training Collaboration Committee to conduct a needs analysis to improve instructional technology training and report recommendations to the Executive Collaboration Committee.
 - b) Encourage instructors, professors, librarians, etc., who use distance education to be competent in the use of instructional technology.
- 4) Implement a Wisconsin Educational Network capable of supporting the current BadgerNet Video network application and future applications on a common standards-based platform. This will facilitate PreK-20/library collaboration and economical global educational connectivity.
- 5) Sustain State of Wisconsin educational technology funding (educational public policy funding) and consider additional funding options.
- 6) Design a network that is flexible, affordable, scalable, and can support future distance education and administrative applications.
- 7) Continue to facilitate the advancement of lifelong learning initiatives via educational technology to improve opportunities and quality of life for Wisconsin's citizens, and position the State of Wisconsin to compete globally in the 21st century. This should include increased use by state agencies of Wisconsin's Educational Network to save money on training and travel by holding meetings and training over the network.

The Issue of Funding

Funding for any new project is always an issue, especially when the economy demands a conservative budget. WENCC has identified a number of potential funding sources for Wisconsin's Educational Network that could be considered by the Legislature. Some of these potential funding sources may require statutory change.

- Approximately 50% of the actual cost for public and private PreK-12 and public libraries can be recovered from the federal E-rate program.
- Legislation associated with current TEACH programs could be modified to increase the cost to the users.
- Procurement of a new contract will allow for negotiation of costs to purchase more service with current levels of funding.
- Experience gained by management of current distance education networks will facilitate a more efficient, dynamic and affordable Wisconsin Educational Network.
- The total cost could be shared by allowing the Wisconsin Educational network to serve state agencies and municipalities.
- Fees charged to political subdivisions (municipalities) might provide another revenue source because the Wisconsin Educational Network will help develop the quality of life, economic appeal to businesses, and overall community educational access.
- Providing training to private businesses can generate revenue for educators to offset network participation costs.
- School buildings, higher education campuses, and public libraries are convenient settings for business meetings. Businesses could hold conferences in school facilities when the facilities are not used for teaching.

Summary

To summarize, the BadgerNet Video Network contract, which today serves 350+ schools and libraries with full-motion, interactive videoconferencing ability, expires in December 2005. The schools currently using BadgerNet depend on it to provide classes to their students to which they would not otherwise have access. This creates opportunities not only for students all over the state who have access but also creates the opportunity for the State of Wisconsin to ensure it retains its economic leadership in a global economy.

It is important to retain the current videoconference capability, but we must also make sure that no child is left behind and that all students have access to distance education classes. It is also important that the state fund this network. Otherwise, public and private PreK-12 schools cannot afford to participate in distance education. WENCC is asking the Legislature to support not only the concept of a Wisconsin Educational Network but also provide the funding necessary to implement it.

The business case will impact the opportunity for and quality of education for every Wisconsin citizen regardless of age, economic status, or where one lives. The beneficiary may be from pre-schools,

traditional and non-traditional PreK-12 students, or students pursuing technical, bachelors, or postgraduate degrees. The beneficiary may also be a person serving in the Armed Forces taking distance education classes from a Wisconsin educational institution or even an adult seeking education to change his or her career path from home, work, or a public library.

It is recommended that every Wisconsin educational institution and public library be connected to a ubiquitous Wisconsin Educational Network to ensure equitable educational opportunity to overcome the digital divide, to protect the current Wisconsin educational community investment in the global education marketplace, and to further position Wisconsin and Wisconsin businesses to compete in the global marketplace.

Implementation of the recommendations in this business case will also strengthen the educational technology training and curriculum integration for all Wisconsin educators and will improve the skill of our workforce and support the overall Wisconsin Economic Development Plan.

Wisconsin Distance Education Network Business Case Report

Introduction

The State of Wisconsin contract for the enterprise BadgerNet Video Network will expire December 5, 2005. This contract was procured and administered by the Department of Electronic Government (DEG), formerly a division within the Department of Administration (DOA). Of the 450 full-motion, interactive, video classrooms in Wisconsin, 380 are currently served by BadgerNet. This number includes PreK-12, the University of Wisconsin System, the Wisconsin Technical Colleges system, private colleges and schools, and public libraries.

The video platform, chosen through the Request for Proposal (RFP) process for the BadgerNet Video Network, was the best and most cost effective at the time the contract was signed in March of 1998. Over the past five years, there have been many new developments in video network technology. In January of 2001 the manufacturer of the video codec platform announced it was abandoning development and manufacturing of the codec, despite its previous commitments to upgrade equipment.

With this announcement, it quickly became apparent that procurement would be needed to continue to provide a video network of equal quality to existing and new educational users and state agencies. However, the advent of new distance education technologies (e.g., streaming video and IP video) necessitated a look at the bigger picture of distance education provision in the State of Wisconsin. This would include a needs assessment of end users in education, government, and special communities such as the hearing impaired. With this assessment in hand, a business plan giving direction to the next procurement could be written.

TEACH and DEG agreed that this complex project could not be accomplished by a single agency. A collaborative committee consisting of all affected entities with sponsorship by their agencies' executives would be an effective way to handle the project. It was decided that TEACH would lead the needs assessment and business plan portions of the project, and DEG would lead the procurement and implementation portions of the project.

In many sections of this document and supporting information sections you will find the hard facts, statistics and anecdotal information that substantiates the following statement:

Since 1998, \$309,346,300 has been spent on PreK-12/library educational technology with a portion of that money going to 16 technical colleges and 28 private colleges and universities (through the TEACH program). In addition, all these educational sectors have spent hundreds of millions of additional dollars in partnership with the State from their own operating and capital budgets. Together, a solid investment in educational technology and infrastructure has been established in Wisconsin. It is safe to estimate that over a billion dollars has been spent in Wisconsin by public and private educational institutions and public library.

These investments are capable of and intended to support the current and future emerging needs of their users for years to come. While we all know technology changes rapidly, state of the art technology can be upgraded and designed to support a reasonable number of years of reliable service life or life cycle. The common denominator with this technology investment is the transport medium or "network" that connects it all together. The network moves information (educational content), be it voice, data or video, from place to place or multiple places simultaneously.

The mission established by the Legislature in October 1997 of using educational technology to break down the barriers of distance and time now shows those barriers cracked and broken, but they are not gone. Wisconsin continues to face inequity in access to the full range of educational opportunity. Where a student lives and the economy of the student's local region can still negatively impact individual access to educational opportunity or adequate, affordable educational technology access.

The State of Wisconsin has, without a doubt, accelerated the use of educational technology and provided the opportunity for any school district, library, or private PreK-12 school to have a basic level of affordable access to the Internet and educational technology. For example, all 426 public school districts and all but one public library in the state are connected to the Internet; 92% of our public PreK-12 classrooms have some kind of Internet capability. However, just having "some kind" does not mean it is adequate; and "some access" is not going to support the classroom of 2010. Public and private higher education institutions are better equipped for intra-campus education application; but even today, they struggle with obtaining affordable and adequate high-speed access to the global educational network or Internet.

This brings the State of Wisconsin to a crossroads in educational infrastructure investment and in the global business marketplace. Will Wisconsin take the next crucial step to move forward and establish this great state nationally and globally as a world class educational system leader?

"In the next several years, the perpetual acceleration of Wisconsin educational technology used by our educational institutions and libraries is going to cause existing networks to become congested and restricted. In the simplest of terms, we will be just fine as long as we stay within our building or campus. As soon as we want to connect anywhere outside those boundaries, it will be like waiting at the end of the line to get Green Bay Packer season tickets." (WENCC)

If we are not careful and do not implement the appropriate plans to manage and provide for the needs identified in this business case beyond 2005, the investments made thus far will be jeopardized. The vision of quality education will erode. Forward momentum will stop. Therefore, in the best interest of the students, citizens and the State, Wisconsin needs to move forward.

When Wisconsin's Legislature created TEACH to provide subsidization to schools for connectivity to the Internet and the BadgerNet Video Network, it wisely laid the groundwork for providing access to equal education opportunities to many of the state's students. The Legislature made significant financial commitments to create the partnership between the State of Wisconsin and the Wisconsin educational community to provide the catalysts for this change. It is important that the State of Wisconsin not falter at this junction and continue to commit to providing opportunity of equal access to education to all its students.

Wisconsin Executive Collaboration Committee

On September 17, 2001, the following members of the Wisconsin Executive Collaboration Committee met to commission and appoint representatives to the Wisconsin Education Network Collaboration Committee (WENCC):

- Chairperson Doris J. Hanson, Former Executive Director, TEACH Board (Mr. Ray Allen was appointed Executive Director of TEACH in June 2002.)

- Ms. Elizabeth Burmaster, State Superintendent of Schools, DPI
- Mr. Edward Chin, Former President, WTCSB (Dr. Richard Carpenter was recently appointed as President and State Director)
- Mr. Thomas Fletemeyer, Director, ECB
- Dr. Katharine Lyall, President, UW System
- Ms. Susan Puntillo, Director, Workforce and Financial Management, DEG
- Dr. Rolf Wegenke, President, WAICU

The Executive Sponsors also appointed representatives to WENCC, with these appointees responsible for representing their agency and the enterprise interests during both phases of the project.

The Representatives appointed by the Executive Collaboration Committee to WENCC were:

- Mike Mietz, TEACH Wisconsin
- Steve Sanders, DPI
- Greg Wagner, WTCS
- Mike Kern, ECB
- Ed Meachen, UW System
- Jody McCann, DEG
- John Sutton, St. Norbert College
- Joan Wade, CESA 6

In addition, the following individuals assisted in carrying out the mission assigned to WENCC:

- Shannon Martin, TEACH Wisconsin
- Tracy Becker, TEACH Wisconsin
- Lisa Hanrahan, TEACH Wisconsin
- Bob Bocher, DPI
- Rob Roy, DPI
- Barb Cummings, Northcentral Technical College
- Hal Schlais, UW System
- Dwayne Williams, UW System
- Beth Hastings, DEG
- Mike Toner, DEG
- Chris Alberts, DEG
- Dick Strand, DEG
- Carol Mothershead, DEG
- Paul Nelson, WAICU

Principles

It cannot be emphasized often enough that Wisconsin must be an active participant in the evolving global economy. The economies of developed and developing countries can no longer be insular, and this demands a workforce with the tools to flourish and succeed in the global economy.

Wisconsin's motto is *Forward*. We are asking state legislators to recognize the merits of continued support for a distance education network in Wisconsin that will provide ubiquitous access and increased educational opportunities throughout the state to *all* its students.

In addition, access to a statewide distance education network could provide the capability for government at all levels—state, county, municipal—to save taxpayer dollars by holding meetings and training sessions via videoconferencing and other media rather than paying travel costs. This will allow Wisconsin's governments to move *Forward* while still holding the line on tax increases to its citizens.

The following principles upon which this business plan is proposed are directly relevant to Wisconsin's economic future, to its continued national leadership, and to its motto to always move *Forward*.

1) The Quality of a Student's Education Should Not Depend on Where the Student Lives

Competing in the global economy means that Wisconsin must tap all the energy and ambition its citizens can bring to the fore. Great minds are located throughout the state, in small, rural schools with small budgets as well as larger, more urban communities with larger budgets. For Wisconsin to continue its leadership role, *all* students with an aptitude for and desire to learn foreign languages, chemistry, English literature, physics, history or art must have the opportunity and access. Ensuring that distance education technology is available in *all* school districts will provide that equal opportunity to young minds throughout the state. The federal No Child Left Behind Act of 2001 directly addresses this issue of equal access.

According to Title II, Part D of this federal legislation, the primary goal of the Enhancing Education Through Technology section of the law is to encourage the use of technology in schools to improve student academic achievement. This section includes a goal that every child be technologically literate by the end of eighth grade. It also strongly encourages technology integration into curriculum through teacher training and curriculum development with leveraging state administered federal grant monies to local education.

This federal law turns what was once a good idea—educational technology—into a mandate. Wisconsin has already invested in its students by being a leader in distance education and allocating funding for a full-motion, statewide video network. By continuing to allocate monetary support of a statewide distance education network, Wisconsin will not just meet a federal mandate. It will continue to be an innovator as education needs and requirements change in the 21st century.

2) Wisconsin's Teachers Must Be Technically Literate and Teach Using Technology

Today's students enter kindergarten with the same comfort with computers that their parents enjoyed with crayons and pencils. Teachers in the 21st century must be at least as technically savvy as their students to be effective instructors.

The No Child Left Behind Act of 2001 also addresses teacher technology training and professional development. It is critical that state regulations and school administrations recognize and support the imperative to provide technology training to Wisconsin's dedicated teachers. To move Wisconsin's educational system *Forward*, policy must be instituted to require more comprehensive technology training for a teaching license and continuous teacher technology training to stay abreast. Two of the ten standards, required of all teachers in Wisconsin's new PreK-12 licensure rules, necessitate competency in educational technology.

A successful transition to this new vision is imperative if Wisconsin's educational system is to continue to be a leader. Technical training must not be perceived as a perk for Wisconsin's talented and dedicated teachers but rather as a routine component of the teacher training for which teachers are paid and school districts are responsible to provide.

To enhance Wisconsin's student success, Wisconsin's teachers must learn the teaching techniques necessary to successfully incorporate technology in the curriculum. A balance is required between individual responsibility to obtain training and training provided by the employer. A balance is required between participating in training during personal time and contractual time. A clearer understanding between teachers and administrators is needed relative to expectations and processes.

It is critical to have a Distance Education Network in Wisconsin. It is equally critical that teachers receive the instructional technology training they need to utilize technology tools to their fullest. This will be money well spent because that knowledge will be taken back to the classroom for students' benefits. In turn, the State of Wisconsin will benefit.

3) Wisconsin's Economic Development is Dependent Upon an Educated Workforce

Throughout the State

Wisconsin must attract new commercial investment to *all* parts of the state—from the more developed southeast to the more sparsely populated northwest. To accomplish this, Wisconsin must retain and nurture its national reputation for highly educated and skilled workers. Formal education no longer ends at age 18, or even upon graduation from higher education. Increased use of technology, the global economy, and the rapid changes in farming, manufacturing, business, education, and government processes require continuing education in all fields. Workers are also switching fields at a rapid pace or are looking to begin new careers at older ages. These workers must have avenues to increase their knowledge and capabilities that are not limited by geography. Distance education can provide that avenue, even to citizens in the most remote parts of the state, who are anxious to learn and contribute to the economy of their state. Wisconsin needs educated and skilled workers in all quadrants of the state in order to remain competitive.

Wisconsin's future is based on the productivity of its citizens. Distance education technology that is accessible to continuing and lifelong learners provides the opportunity to citizens throughout the state who want to learn, to work, and to be productive.

At the focus group in Chippewa Falls, a teacher from a technical college related that he asked the students in one of his distance education classes what they hoped to gain from it. One student gave a poignant response. She said that without this specific class, available only via distance education, she could not achieve her mission of earning a living doing one job rather than the three jobs she currently juggled. She was confident that she would meet that goal by the time her daughter was five years old.

With the help of distance education, not only will this young mother achieve her goal of security and quality of life for her family, but Wisconsin will also benefit because this young mother and her daughter will have stability, and a future, and will contribute to her community.

An important question is where does lifelong learning occur? How do Wisconsin's citizens seek out the information they need to grow, learn and prosper. Formal, continuing education can be obtained from colleges and universities located throughout the state. However, the most common point of access for life long learning for the majority of Wisconsin citizens is probably the local public library.

Libraries Touching All Citizens

WENCC held eight focus groups throughout Wisconsin from March through June 2002. One of them, was held at the South Central Library System and included a range of library staff from a variety of public

library types and geographical locations in the state. It was revealing because they are sometimes the forgotten educators in communities throughout the state who provide an environment to *all* of Wisconsin's citizens for lifelong learning.

These librarians eloquently argued that libraries are resources that supplement the more formal support students receive from academic libraries. Two thirds of the Wisconsin population have library cards and are served by public libraries. When Wisconsin's citizens no longer have access to the PreK-12 school library, technical college library or the university library, public libraries become the main resource for the rest of their lives. Unfortunately, the funding libraries receive is rarely enough to meet the needs of the citizens who patronize them; and because funding is usually at a local level, library resources vary dramatically throughout the state. These librarians believe that Wisconsin will take a huge step when libraries are funded with the same priority that school funding receives.

Libraries are a primary educational tool and are a common denominator for Wisconsin's citizens in villages, towns and cities throughout the state regardless of a person's age, financial situation, or background. Traditionally, Wisconsin's citizens go to their public libraries to use a computer to write a document or send an email or search the Internet. They use printed library resources to help them with research; they sign up for book clubs sponsored by libraries; they bring their children to story hour at the library.

The Internet has changed library services and access. Libraries provide remote access to online catalogs, eBooks, web resources and licensed reference databases. Librarians teach citizens how to use these resources. In the SCLS more than 50% of the holds placed on materials were placed remotely, not from within the walls of the traditional library. Libraries need to be where their users are...online. They will need bandwidth to provide increasing multi-media access to information sources from both within and outside their walls. Dispersed human resources in the library community can be maximized through audio and video conferencing for training, administrative use and public facing services.

Librarians can be trained remotely. Staff in multiple locations and multi-county systems could communicate via desktop video. Virtual reference will start with Internet chat, but two-way audio and video will be enabled by affordable bandwidth. Video-on-demand story hours can maximize resources and provide specialized services such as story hours in Spanish and Hmong. It is in the state's best economic and long-term interest to promote literacy across all segments of the population. Distance education technology that is accessible to continuing and lifelong learners through the Wisconsin's public libraries will provide the opportunity to *all* its citizens to learn.

4) Distance Education Technology in 2010 and Beyond

Technology changes constantly and at a faster pace than ever. What was leading edge technology five years ago is outdated today. Money spent on what may now be old technology provided access to information not otherwise available to thousands of students all over the state and opened the world to them as they prepared to become Wisconsin's future workers and leaders in the global economy.

To protect the investment in distance learning technology over the last five years, Wisconsin must continue to invest rather than slide backward. The existing videoconference network has given thousands of students the opportunity to complete study programs not otherwise available to them.

Students in the northwest part of the state can videoconference with classes held in schools in the southeast part to complete coursework in subject areas they could not otherwise study. The existing videoconference network is a window to the world via special events and field trips to places such as the Great Barrier Reef; the Field Museum in Chicago, and the United States Senate.

One teacher at the Green Bay focus group said that after 9/11, her school had the opportunity to videoconference with an American diplomat in Ecuador who gave the students global insight into the events of 9/11. The teacher said this contact was invaluable during a confusing time; and it was an incredibly unique and effective learning experience that the school could never have provided without distance education technology.

Wisconsin must continue to move technically Forward and embrace the next generation distance education network so that its schools can use technology to teach its students to compete in this global economy.

Wisconsin must continue and provide the educational technology training its teachers need to teach their bright, technologically savvy students.

Wisconsin must provide distance education opportunities to its lifelong learners to ensure that all citizens can contribute to the state's welfare. And Wisconsin must move *Forward* to ensure that government utilizes distance education networks for training and meetings to cut operating costs.

Adoption of this plan and allocation of funding for the next generation of Wisconsin's distance education network will be pivotal as this great state moves into the 21st century.

Strategy

The strategy for undertaking this complex project was to establish two specific segments of the project and assign a project manager for each. TEACH was designated as project leader for the needs assessment/business plan portion of the project. DEG was designated as project leader for the procurement and implementation portion of the project.

For the first segment of the project, WENCC, with TEACH as project leader, would spend 10 months obtaining the information for the development of a business plan to present to the Legislature. During that time, WENCC would:

- develop the process to obtain the necessary information;
- gather the information to do a needs assessment; and
- write a business plan using the information gathered.

For the second segment of the project, WENCC, with DEG as project leader, would spend approximately 15 months to write a Request for Information (RFI) and a Request for Proposal (RFP) and then 18 months for implementation once the contract is awarded.

The data gathering would use various methods to target a number of audiences. WENCC was to:

- facilitate focus groups with a variety of PreK-20 end users including public and private PreK-12, higher education institutions including the technical colleges, UW System and private universities and colleges;
- facilitate focus group with education special interest groups;

- facilitate focus group with representatives of Wisconsin public library systems;
- send a survey from DPI and TEACH to all 426 public school districts (to be completed by administrators and technology coordinators);
- submit a Request for Information from the Wisconsin Association of Distance Education Networks (WADEN), the directors of which manage the 40 regional networks around the state;
- send a survey to teachers in all 426 public school districts requesting a response from the classroom educators in Wisconsin;
- interview state government agencies regarding their current and planned use of distance education technology; and
- survey representatives from deaf and hard of hearing state, university and technical college employees.

Common Themes, Conclusions, and Recommendations
By
Wisconsin Educational Network Collaboration Committee (WENCC)

Over the past nine months, the Wisconsin Educational Network Collaboration Committee (WENCC) has gathered a significant amount of information regarding current and projected use of videoconferencing and other distance education media in Wisconsin. This process included facilitated sessions with eight focus groups throughout the state, surveys sent to teachers, administrators, technology coordinators, and network directors, and interviews of state agencies and the hearing impaired community in state government as representatives of special interest groups. The objective was to learn participants' needs regarding the next-generation, distance education network.

The committee studied hundreds of pages of information and met numerous times to discuss the information. Through a professionally facilitated session, WENCC came to a consensus regarding the most significant documented common themes from the focus groups, surveys and interviews. Using those themes, the group agreed on conclusions and wrote recommendations and an action plan.

Following are the major themes identified as crucial to Wisconsin's next generation educational network along with each theme's conclusion and recommendation:

Theme: A Standards-Based Network with Adequate Bandwidth

- A statewide Wisconsin Educational Network is required. The enterprise network solution must be based on a standard platform capable of supporting current and emerging educational and administrative technology applications.
- The network must provide seamless connectivity between all Wisconsin educational institutions, libraries, and municipal governments. In addition, the state should consider the benefits of allowing non-profit and community organizations to use this network as well as allowing private sector use for training. Interoperability between all these entities is paramount.
- All users must be on a common standards-based platform. The technology should be ubiquitous and flexible, support accessibility anywhere, anytime, and provide sufficient bandwidth for future needs/growth.
- The State of Wisconsin must continue to support the existing high quality video distance educational classroom application used by the 450 video distance education classrooms functioning today.
- The Wisconsin Educational Network must be affordable.

Conclusion:

Wisconsin needs a standards-based, affordable network with adequate bandwidth that can support multiple applications and provide universal connectivity is critical to accommodate increasing demand as use of the Wisconsin Educational Network continues to grow. The network must be scaled at implementation to meet these bandwidth needs.

Recommendation:

Procure a standards-based Wisconsin Educational Network with adequate bandwidth to support curriculum/training and administrative needs of educational institutions including libraries, state and municipal governments, as well as the private sector, non-profit and community organizations for training and education. The network should be extended to the building level or a primary distribution point in each district or campus.

The new educational network should provide seamless connectivity between all Wisconsin educational institutions, libraries, and municipal governments. All users should have access to a common platform. The technology chosen must serve educational needs, be ubiquitous, and flexible.

Theme: Equity

- Equity of access for all students regardless of age, geography or economic status is needed. Rural areas are more dependent than urban areas on video distance education to provide classes to meet their basic educational mission. As intended through programs funded by the Legislature, educational technologies break down the barriers of time, distance and course availability providing equity to students in geographic areas that offer fewer class options. Wisconsin has made a good start in its goal to provide equity to all students, but it must continue forward or that mission is not complete.
- The Wisconsin Association of Distance Educational Networks (WADEN) survey provides many examples of equity statements. It should be noted educators feel progress is being made in attaining equity, but more is needed. (*For additional information see Document III, Wisconsin Educational Network Business Case Appendix.*)
- All services must be provided in an equitable manner regardless of where one resides in the state or economic status.

Conclusion:

The quality of education in Wisconsin should not depend on economics or geography. Legislative funding of telecommunications access programs has made it possible to connect the 426 public school districts and 441 public libraries in Wisconsin to the Internet with an affordable basic level of service. The UW System, technical colleges, and private colleges and universities are connected to the Internet via high-speed lines. The first milestone—getting schools connected as directed by the Executive Branch and Legislature—is complete.

However, until there is access to each school building, whether rural or urban, PreK-12 or higher education, the state cannot achieve the ultimate goal of fully maximizing educational technology in all instruction, at any grade level. Educational technology investments made thus far in Wisconsin have narrowed the educational equity gap. The narrowing and eventual closing of the gap will be accomplished with sustained and future funding.

Information obtained for the needs analysis identified the strides made to improve educational equity statewide, but Wisconsin still has not achieved complete equity. Focus groups identified many non- and under-served groups of people, traditional and non-traditional students who will be served by furthering educational technology, which in turn is a catalyst for economic development.

Recommendation:

Continue to support expansion of access to educational technology in order to enhance equitable educational learning opportunities for all Wisconsin residents regardless of where they live, their age or economic status.

Theme: Professional Development (training for effective use of instructional technology incorporated in the teaching/learning process)

While WENCC's charge did not include professional development, data gathered indicates that this issue needs to be addressed by the Executive Collaboration Committee. Reinforcement of statewide guidelines regarding instructional technology training for teachers is paramount. The issue goes beyond merely training teachers, instructors, librarians, students, citizens, and other users on how to operate the network. Digital technologies are fundamentally changing the way we create, access, store, and communicate information, which is directly related to the success of continued improvement and utilization of technology in teaching.

The following is specific feedback on this theme from the WENCC focus group and the WENCC Teacher Survey:

- Teachers have learned to make increasing use of technology.
- The need for more instructional technology training, access to instructional technology training, payment for technical training, and administrative issues associated with instructional technology training were identified as needing substantial change.
- Sufficient instructional technology education for teachers relative to quality and PI34 is needed.

Conclusion:

Professional development for teachers in the effective use of instructional technology and its incorporation into curriculum is critical to maximize the investment in educational technology by increasing competency and comfort in its use.

Of the 9,036 teachers who responded to WENCC's teacher survey, 52.5% cited teacher training as the second most important issue of the nine targeted inhibitors that limit use of technology. Survey results indicate the following statistics:

- Fifteen point one percent (15.1%) responded that lack of training precludes them from using technology at all.
- Teachers are aware of the value of technology with 33.5% saying it is very valuable in preparing for class, 43.5% saying it is somewhat valuable, and only 23% saying it is of little or no value at all.
- Of the teachers surveyed, 65% find technology somewhat or very valuable in generating lesson plans and 78.4% stated technology is valuable to use during classroom instruction.

Focus groups stated there are local issues that impact their ability to attend training. These include:

- required in-class time with their students;
- administrative policy;
- willingness of school administrators to hire substitutes to enable teachers to attend training;
- availability of substitutes;
- conflicting in-service dates;
- lack of a statewide uniform calendar; and
- unclear guidelines on funding for training; i.e., is it the responsibility of the school district or the teacher.

All of the Focus Groups talked about the need for professional development in the use of educational technology. To WENCC's question, "What is your vision of instructional technology for 2010?" the response was that administration will support the use of technology and the need for teachers to be trained, have preparation time for using technology, and teachers and other staff will be better trained in technology in general.

For the past four years, DPI and TEACH Wisconsin have administered a School District Technology Survey. Each year the survey asks, "In what areas are your greatest needs for technical assistance?" In all four years, districts have ranked professional development (helping teachers use technology effectively) as the number one need.

Recommendation:

This recommendation is twofold:

- 1) Appoint a Wisconsin Educational Network Professional Development/Instructional Technology Training Collaboration Committee to conduct a needs analysis to improve instructional technology training and report recommendations back to the Executive Collaboration Committee.
- 2) Encourage instructors, professors, librarians, etc., to be competent in the use of instructional technology.

Theme: Educators Need To Retain Current Applications

- Educational technology and educational telecommunications access services are widely used by educators at all levels today.
- Wisconsin educators have made significant investments in educational technology.
- PreK-20 Educators that use the BadgerNet Video Network distance educational classrooms (approximately 450 sites, 62% of the public school districts and 70 technical college sites) need continued support for this specific application.

- Educators want to retain current technology but also to be able to have the capability to incorporate new technologies as they evolve.
- As decision-makers look to the future of distance education technology, it is important that they not strand the considerable investment already made in educational technology. For example, TEACH has invested \$309,346,300 thus far (see itemization of figures below).

Following is the State’s investment to date for distance education via public policy funding (TEACH) for educational technology/training from 1998 - 2002:

\$167,000,000	Purchase Technology
\$14,000,000	Professional Development
\$88,000,000	Wiring Schools
<u>\$40,346,300</u>	<u>Video and Access</u>
\$309,346,300	Total

Following is the State’s Investment for FY 2002/2003:

\$35,000,000	Purchasing Technology
\$4,000,000	Professional Development
<u>\$14,700,000</u>	<u>Video and Access</u>
\$53,761,000	Total

Note: Individual PreK-20 entity investment is not included.

Conclusion:

PreK-20 educators and librarians that use the BadgerNet Video Network distance educational classrooms, approximately 450 sites, will need continued support for this specific application.

Continued functionality of the video network is essential, as is continued functionality of the data network applications including expanded bandwidth requirements. It is essential to retain the functionality of the digital educational technology classrooms and institutional applications currently operating. The next generation distance education network must be compatible with existing classroom equipment.

Recommendation:

Implement a Wisconsin Educational Network capable of supporting the current BadgerNet Video Network application with its 450 sites and support future applications on a common platform facilitating PreK-20 and library collaboration.

Theme: State Investment

- The State of Wisconsin must continue to provide funding for the current and future educational technology and for educational telecommunications access. Access relates to connection services to the Internet and any network platform involved with transporting educational data. Educational data includes educational content, learning system access, voice, data, and video educational and administrative data. Statewide, national and global connectivity is needed.

- State involvement and financing is critical. Without state funding support, there will be no enterprise distance education network, as schools, especially PreK-12, will not have the funding to connect to Wisconsin's Educational Network, thus creating a lack of equity.
- The State must continue to provide and manage a backbone network for the Wisconsin Educational Network.
- The state must implement procurement strategies that ensure affordable technology is available to the Wisconsin educational community, including libraries and municipal government, for instructional and administrative use.

Conclusion:

Continued state investment and funding is essential. Schools, especially PreK-12, and libraries, can not support budgets to build and connect to a statewide network to provide distance education opportunities to Wisconsin's student population. If the state does not fund the backbone and subsidize connectivity to the end points, Wisconsin cannot achieve educational equity for all its students including lifelong learners.

Recommendation:

Sustain State of Wisconsin educational technology funding (public policy educational funding) and seek and allow other revenue options to maintain and expand the system.

Theme: Progress toward Enhanced Learning Objectives Needs to be Maintained

- Collaboration among agencies, institutions, governments, organizations, community, and business should become a common every day educational process. Access to global resources is critical to expanded learning opportunities.
- Teachers not only want, but also need, technology to continue to improve education and to support expanded learning opportunities. Teachers responding to the survey project the future world will be smaller and more accessible, with a wealth of knowledge ubiquitously available. As one WENCC member wrote during the facilitated session, "It is all about improving communication, which is at the heart of learning!"
- Educational technology helps overcome diverse learning and teaching styles, and this must continue to enhance opportunities for student achievement to be maximized to gain the 21st century skills required to compete in a global economy.
- Access is needed to content providers and the emerging learning system applications.
- Integration of technology into the curriculum will continue with more educational materials delivered via distance educational technologies.

Conclusion:

A network must be installed that will provide access to learners of all ages throughout the state and open the world and a host of content providers to each and every learner. This network will provide teachers,

librarians, instructors, etc., with the tools to help their students obtain the best education possible and obtain 21st century skills in a global economy.

Recommendation:

Design a network that is flexible, affordable, and scalable and can support future education and administrative applications that will meet distance education and administrative goals.

Theme: The Evolution to Lifelong Learning Needs Significant Planning

Libraries and other educators express the need to develop learning systems to facilitate and support lifelong learning. The need to increase public awareness of opportunities available for lifelong learning is keenly important.

Conclusion:

Lifelong learning will provide a skilled workforce for statewide economic development as Wisconsin competes in a global economy. Lifelong learning serves all Wisconsin's citizens and enhances their quality of life. A Wisconsin Educational Network will support access to virtual learning communities.

Recommendation:

Continue the advancement of lifelong learning initiatives via educational technology to improve Wisconsin opportunities, quality of life, and position to compete globally in the 21st century. Include increased state agencies' use of Wisconsin's Educational Network to save money on meetings, training, and travel.

Increased use of the network will allow greater participation by tapping into geographically diverse intellectual resources enabling a global competitive edge, contribution to economic development, and continued leadership in the use of educational technology. It is imperative that we provide a distance education network to learners around the state, regardless of age or location, which delivers education without limits!

Summary of Needs Assessment Based on Themes and Conclusions

Based on the information from the needs analysis combined with the expertise represented on the committee, WENCC concludes that a Wisconsin Educational Network will be significant to Wisconsin's success in achieving its educational goals and state, national and global economic development objectives.

In the United States today, a statewide educational network with global outreach can be procured, installed and maintained only if the cost is shared through a partnership between government and the users. In the past, higher education institutions were better able to develop solutions to support their technical needs. However, public school districts and Wisconsin's Private PreK-20 schools were not able, and will not be able in the future, to achieve parity with public higher education institutions without some form of assistance from government. Because the 426 public school districts are independent entities, there is no process to operate as a group to develop common technological solutions. Establishment of a statewide master plan is needed to provide a link for PreK-20 collaboration and connection via a Wisconsin Educational Network with any educational institution of their choice.

Government funding can be federal, state, local, grants, or combinations thereof. The Federal E-rate program is an example of current federal funding. TEACH Wisconsin is an excellent example of state program funding. There are many business foundations that support educational networks.

The WENCC teacher surveys conducted for this analysis documents positive results regarding teachers' interest in using technology. Wisconsin is itself an excellent national example. North Dakota is another with an initiative similar to TEACH. Minnesota has been watching Wisconsin and has moved toward a more centralized and organized approach.

According to the information WENCC gathered, the Wisconsin educational community, which includes public libraries, has made significant educational technology investments in classroom equipment, computers, software, local area networks, wide area networks, administrative systems, networking and state of the art campus and building wiring infrastructure. This has been done from a number of funding sources.

Wisconsin's independent colleges are some of the best technologically equipped in the country and have a history of PreK-20 collaboration; and Wisconsin's Technical College System is the leader and senior "Pioneer" of video distance education in Wisconsin. Technical Colleges have mentored many PreK-12 school districts in distance education.

With the installation of the BadgerNet Video Network beginning in 1998, the inception of TEACH in 1997, and the cooperative relationship between educational entities in Wisconsin, we have built the Tall Arch of Wisconsin Educational Technology. Each block that rises up from the base in the arch represents funding that institutions have allocated from their own resources to build their portion of arch. Without continued government assistance, the quality and use of distance education technology in Wisconsin could deteriorate.

The keystone holding the various blocks of the arch together is the public policy funding provided by the Executive Branch and the Legislature, which gives the arch its strength, and binds everything together. Without the provision of public policy funding, there will be no arch. And without continued public policy funding and centralized, statewide, collaborative planning, there will be no Wisconsin Educational Network.

The millions of dollars already invested in educational technology have accomplished the Legislature's initial goal of accelerating the use of educational technology to break down the barriers of distance and time, thus leading to educational equity. It is critical that the state continues on this path and to insure adequate educational telecommunications. If we do nothing to support the need for this growth, educators will not be able to utilize educational technology as intended in 2005 and beyond.

Action Plan to Support the Business Case Recommendations

- A futuristic Wisconsin Educational Network should support use by PreK-20 education, libraries, and state/municipal governments. It should also be open to private business for educational applications, which could become a revenue source to help pay for the network. This will require contract stipulations and possibly a change in statute because connectivity between government and business has historically been prohibited.
- Consideration should be given to formation of a PreK-20 Wisconsin Educational Grant Team whose sole purpose is to solicit educational grants for Wisconsin. The team could be formed by the loan of staff time from each educational entity to serve on the grant team and track the results of the team to determine if it should be continued.

- To meet the PreK-20/library educational technology needs as well as the needs of state and local government, a master plan is essential.

Funding

Funding for the Wisconsin Educational Network could be derived from a number of sources

- Approximately 50% of the actual cost for public and private PreK-12, and public libraries can be recovered from the federal E-rate program under the TEACH statewide consortium application.
- Legislation associated with current TEACH programs could be modified to charge additional cost to the users.
- Procurement of a new contract will allow for negotiation of costs to purchase more service with current levels of funding.
- Experience gained by management of current distance education networks will facilitate a more efficient, dynamic and affordable Wisconsin Educational Network.
- The total cost could be shared by allowing the Wisconsin Educational network to serve state agencies and municipalities.
- Fees charged to political subdivisions might provide another revenue source because the Wisconsin Educational Network will help develop the quality of life, economic appeal to businesses, and overall community educational access.
- Providing training to private businesses can generate revenue for educators to offset network participation costs.
- School buildings, higher education campuses and libraries are convenient settings for business meetings. Businesses could hold conferences in school facilities when the facilities are not used for teaching.

Cost Assumptions for the Wisconsin Educational Network 2005

Background

The state has learned from experience that estimating the costs of a statewide education network this early in the process is virtually impossible. There are too many variables and pressures, so budgets are often understated.

In this cycle of development and evolution of the decision making process for the next Wisconsin Educational Network, we know much more about the total needs of educators. We can define the critical issues that will affect procurement objectives that must be achieved for a more cost effective and diverse standards-based distance education network contract.

It was anticipated that deregulation of the telecommunications industry in the mid-1990s, both nationally and in Wisconsin, would bring down the cost of telecommunications service by creating more open competition. Commitments were made following the conclusion of the Thompson Blue Ribbon Commission on Telecommunication Infrastructure (1993) for state government to procure telecommunication services commercially. The state committed that it would not develop, implement and own a statewide fiber distribution network such as Iowa has. A commercially driven, statewide infrastructure with affordable pricing and access to technology for all state residents was desired.

The current reality is that prices for video and data networks are very significant and considerably higher in rural areas than urban. For example, the cost of a data line in a larger city is \$255 to \$355 per month whereas it ranges from \$500 to as much as \$1,500 in rural Wisconsin areas.

Strategy

Cost assumptions for a future network are based on understanding the problems of rural vs. urban costs and managing a more cost effective total solution created by competition or looking at other procurement alternatives that give the state more control over managing the costs and delivering service.

The video link service costs in the current contract are specific examples of rural vs. urban last mile pricing. A possible emerging alternative is to use wireless options that can help eliminate the traditional obstacle of high cost, last mile pricing. Last mile pricing is typically the link from the end user to the backbone network distribution point. In urban areas, there may be options based on wireless licenses currently controlled by public entities to provide cost relief for some of a distance education network if the state finds through the procurement process that a commercially provided service is not affordable.

The inability for business and educational institutions to have statewide access to equitable, affordable, broadband telecommunication access services and the negative impact that has on education and economic development are significant issues requiring attention in this business case.

Scaling the Network

The completion of the first phase of this long-term process is defining the business case recommendations. While it is important to generate some idea of the cost of a Wisconsin Educational Network, we are only at the point where some assumptions can be made. In the next year, during the

technology specification stage, which will lead to the request for bids or proposals, we will be able to more accurately identify the potential cost.

These cost assumptions are based upon the knowledgeable speculation of WENCC team members. The WENCC representatives, a senior management team with significant tenure and combined experience in education and telecommunications, and their associates, which they brought as resources to help do this business case, have in excess of 365 years of industry experience. They also come from a solid mix of individuals with large company commercial business (private sector) experience and education sector/education and technology management backgrounds. Even so, it must be kept in mind that these assumptions are speculative and many of the variables will be subject to change.

Under the current video contract the average monthly video link cost is \$3,500 a month. (This includes finance costs and some network related costs.)

The 2002-03 TEACH Telecommunication Access Budget for video links and data lines for 875 plus distance education connections is \$15,927,700. (The number of connections varies and is expected to continue to increase slightly annually due to applications for service from libraries, private schools, public schools upgrading services and general program support activity.)

For a network that will be a significant statewide investment for any vendor(s) to deploy, a contract commitment of less than five (5) years would be difficult to negotiate with equitable pricing; the shorter the contract, the higher the price.

With a standards-based and scaleable educational network, the state should be safe considering contract extension options or requesting contract pricing based upon different terms of contract length. This assumption is based on the fact that with a standards-based solution capable of growing with users' needs, the concern of contract duration is not primarily based on the technology but rather what the state agrees to pay a vendor for service over the duration of the contract. The selection of a platform with obsolescence protection will be a significant contract negotiation point.

The WENCC recommendation is to acquire a network with an option to take it to the individual building access level. However, we know from today's experience that in many cases we will only have to get to a campus or a school district distribution point. For example, one large data pipe to UW Whitewater, one large data pipe to Madison Public Schools or Milwaukee Public Schools or St. Norbert College should be sufficient. These entities then have the ability to economically distribute the bandwidth between their schools or buildings either through their own private networks or local service agreements with telephone and or cable companies. School districts like Eau Claire and Stoughton have found ways to economically connect their schools together and solved the last mile pricing dilemma. We do not have to build a network to get to every school building in the state.

The next assumption is based on those situations where we do have to go to individual buildings. The best example is the small school district in rural Wisconsin. In this situation, we have one district with three small schools. Each school is in a town separated by several miles. Each building needs access to a statewide education network (or the Internet). They cannot afford \$1,500 a month per circuit per year to connect their schools. We assume we need 3 circuits for this example or possibly one with wireless technology connecting the other two schools.

The next assumption is we have a number of PreK-12 schools housed with all grades in one building or several buildings on the same connecting property. In these cases we need just one larger data pipe.

We can also assume based upon current and projected bandwidth requirements that smaller school districts will only require 4 to 10 MBPS (megabits per second) of data pipe network access depending upon future desktop IP video individual classroom requirements.

Today the basic option is to provide everyone with one data circuit generally capable of carrying 1.5 megabits per second. In 1996 this was considered high level access, but today it is not.

We can also assume that small rural schools with 50 students and the small town libraries will not need large data pipes but a flexible service that meets their needs. Today, we must purchase an expensive T1 for them and they do not use the vast majority of the service. The objective here will be to obtain more economical, lower cost, flexible service to meet their demands.

Access Network Connection Assumptions

Following is an estimate of the possible number of data circuits required.

12	CESA Headquarters
426	Public School District Primary Connections
450	Public Library Connections
28	University of Wisconsin Primary Connections
28	Private Colleges and Universities Primary Connections
93	Technical College Connections (93 video classrooms in service today)
100	Private PreK-12 Schools (Private schools show limited interest in TEACH funding)
900	Individual PreK-12 Secondary School Buildings Connections (This assumption will be quantified in next 12 months)
150	Miscellaneous Connections, possibly Secondary Higher Education Connections (This assumption will be quantified in next 12 months)

Total Wisconsin Education Network Connections - 2,187

Cost Assumptions

We can assume 1,350 of these circuits would be small data pipes for libraries and slightly larger data pipes for secondary school district connections.

We can assume we would need at least 837 higher capacity circuits (2187 minus 1350). These circuits will range from very big for universities to big for large school districts and technical colleges to medium for the remainder of the users. (These size ranges are an analogy to present a concept.) The network will be designed to support the users' needs. A UW campus or Private College or University will use a significant amount of bandwidth and they will require a very large data circuit with the ability to deliver or manage significant capacity.

- The budget for public policy funding today (rounded up) is \$16,000,000.
- 2,187 circuits is approximately a 250% increase in the size of the current network.
- \$16,000,000 x 2.5 is \$40,000,000 (This number includes no increased bandwidth capacity).

- Assume that more bandwidth or bandwidth on demand capability would cost an additional \$10,000,000 a year. (The objective here is to try to identify a worst case cost scenario)
- The annual estimated cost of the network is \$50,000,000.
- Currently, TEACH Wisconsin is recognized as the Wisconsin state network consortium manager and files for federal e-rate reimbursement on TEACH distance education network circuits. Connections for libraries, PreK-12 schools and CESAs are eligible for reimbursement. In this example, 1,888 circuits would be eligible.
- The discount rate is 52% of the actual vendor billing.
- Because many of these circuits would be lower cost circuits, assuming a vendor will charge more for larger circuits, we will estimate that while these circuits represent 86% of the total connections, they will only represent 60% of the total annual cost or \$30,000,000. (This represents a circuit cost of \$1,324.00 a month.)
- A 52% discount of \$30,000,000 is \$15,600,000
- That leaves a balance of \$34,400,000.
- Today there is a statutory user fee charge for TEACH funded circuits. Users are billed \$250 a month for a video link or DS3 data line and \$100 a month for a T1 data line.
- It will be necessary to reevaluate a more appropriate billing structure.
- If the state were to bill \$500 for the larger data pipe, and we bill 1,000 connections at \$500/mo, 200 connections at \$250/mo, and 688 at \$150/mo. that would generate \$7,838,400.
- That leaves a balance of \$26,561,600.
- At this point we have not covered the cost for 299 circuits, and we have not recovered any cost for any higher education connections or included any commitment for public policy funding. The average circuit cost for the 299 remaining circuits would be about \$7,400/mo.
- Today, this cost of \$7,400 is in the realm of what a very large data pipe may cost a company. While it may be on the high side for some services, we already pay \$3,000 to \$4,000 per month for current DS3 (45 MBPS) data lines for large school districts and private colleges. A bandwidth on demand data or SONET connection is equal to three DS3s or 84 conventional T1 circuits. (One objective of the WENCC business case is to purchase more service for less money.) This price would likely be considered low for a rural, traditionally provided telecommunication service for a business. The question is whether or not they could even get one in some places.
- When we subtract \$16,000,000 (current budgeted amount) from the \$26,561,600 balance that leaves a balance of \$10,516,600.
- This balance, \$10,516,600 divided by 299 remaining circuits equates to a monthly cost of \$2,931 per month. If the state charged \$2,931 per month for SONET speed data connections this would be very affordable for any institution.

Under this exercise, the implementation of a new Wisconsin Educational Network could be achieved without GPR funding by continuing to use the SEG funds established through assessments of the Wisconsin Universal Service Fund as it is done now.

If these assumptions are accurate, an educational network satisfying the needs of this business case can be installed by making a Legislative commitment to sustain current funding and looking for other revenue generating alternatives, some of which are proposed in this business case. While administrative costs are not included in this model, that issue can be properly managed and controlled. Other sources of revenue, grants, or other fees or assessments are not included either.

Should this kind of network be implemented, it is possible that it could ultimately be expanded and be used for state agency video and data services. In the future, the State's voice services could also be incorporated on the network. Today, the state spends approximately an additional \$19,000,000 a year (excluding TEACH video link and data line services) on data network services. This additional volume could further reduce the cost per circuit because of the additional volume of business. Finally, this infrastructure could also make its services available to any business located anywhere in the state, which should further drive down the cost to more affordable levels.

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Supporting Documentation from WENCC Partners

University of Wisconsin System IT Plan and the WENCC Master Plan

On July 30, 2002, the Wisconsin Educational Network Collaboration Committee (WENCC) group identified seven categories, or “Themes of Need,” that will guide future efforts regarding the next generation educational network in Wisconsin.

In its own effort, the University of Wisconsin System (UW System) goes through a biennial process to create and update an IT Plan for the System. To test the WENCC Master Plan, the UW System compared it to the UW System IT Plan and the initiatives directed by that plan. Analysis shows that there is a high correlation between the themes of the WENCC Master Plan and those listed in the UW System IT Plan.

System-wide IT Infrastructure

This is a major category in the UW System IT Plan. It focuses on providing a high capacity, IP based network that affords the reliability and available bandwidth for the vast array of online initiatives laid out in the IT Plan. The usability of this network is dependent to a large degree on its adherence to IP standards. These standards allow any new program or application to start with the assumption of a robust, available, and reliable network, without which the efforts would likely falter. By promoting the use of the existing IP network, UW System will also reduce or eliminate the need for special purpose networks dedicated to single applications. The resulting convergence leads to greater economies of scale and simplicity in network management thereby reducing the burden on funding sources.

Centralized Course Management Systems

UW System places a significant emphasis on making centralized Course Management Systems and other eLearning applications available to teachers and learners across the State. By providing the services centrally from a small number of experts (currently at UW-Madison/Doit, Dot.Edu, and WiscNet), the level of service can be maximized while minimizing costs. These eLearning utilities are centrally located and managed but rely on local, on-site professionals to provide immediate and personal support to teachers and faculty, retaining the feel of the individual institution while taking advantage of central management.

In addition to providing these centralized utilities for UW System use, many PreK-12 schools and districts are currently supported, and the UW System IT plan calls for continued support to all levels of education in Wisconsin, particularly in the *asynchronous* environment. Other services already available through UW-Extension provide a host of services for *synchronous* learning environments including audio- and video-conferencing. Using this tiered approach to centralizing eLearning systems, the UW System supports the needs of its institutions in addition to PreK-12 and other educational partners.

Library Efforts to Increase Information Access to All Wisconsin Citizens

The UW System IT Plan includes a strategic plan for IT within the libraries. That plan calls for a “one system, one library” concept to guide the coordination of efforts across the state. The vision provides “...all Wisconsin citizens with access to the university library collection and to a global network of electronic information resources.” Again, a centralized approach to standards-based services is the focus. This effort includes traditional paper resources, but more important, stresses the creation and availability of electronic resources. By sticking to IP access standards and other standards like the Open Archive Initiative, content can be retrieved and used electronically, whether serving a Wisconsin student at any level, or providing global access to locally-owned content.

Another Library Strategic Direction states, “The UW libraries will collaboratively implement staff development programs that anticipate the changing information resource needs of students and faculty.” This directly correlates with the WENCC Theme of Need that focuses on professional development and this collaboration is enabled by the use of a single, standards based network.

UW Online

UW Online is a program mandated by the UW Board of Regents mandated UW Online, that will result in a set of programs offered completely online as a collaborative effort among many of its universities. These programs will be offered on an individual basis to qualified PreK-12 students, including a number of online Advanced Placement courses today. In addition to making more programs available online, this effort focuses on improving the Internet skills required of our students to take advantage of these resources. This educational mission also includes long-range planning for PK-16 Teacher Education that incorporates a model portfolio assessment and addresses PI 34.

In another example of collaborative efforts, inter-institutional/inter-agency collaborative programs are also included in UW Online efforts. Current examples include the Wisconsin Regional Instructional Technology Assistance initiative. This is a collaborative program between CESA 6 and UW-Oshkosh. Exemplary PK-12 educators from CESA 6 worked with faculty from UW-Oshkosh to develop a series of project-based workshops and modules focusing on successful integration of various learning technologies into the approved curriculum. In the next two years, this program expects to offer these workshops to approximately 600 teachers.

Summary

The collaborative efforts present throughout the UW System IT Plan mirror the themes predominant in WENCC discussions. There is a strong need to provide uniform access throughout the UW System and the state and to do so in an affordable manner. Commitment to lifelong learning and professional development is also strong, and the challenge of moving forward while protecting past investments is ever present. Through the use of standards based applications on a single, high capacity IP network, teachers and students at all levels in Wisconsin are able to take advantage of educational resources across the state and across the world.

Wisconsin Technical College System

The Wisconsin Technical College System (WTCS) is composed of 47 major campuses, outreach centers, and the state-coordinating agency. Annually, the WTCS serves 450,000 students including 128,000 through customized training contracts to 4,400 Wisconsin employers.

The WTCS is charged by statute to provide occupational training to ensure Wisconsin has a skilled workforce; to foster economic development; to provide customized training and technical assistance to business and industry; and to provide collegiate transfer programs and educational opportunities to secondary school students as well as basic skills to enable students to effectively function at a literate level.

In the last three fiscal years, the WTCS has served over 162,500 students through a variety of distance education technologies. It is envisioned that technologies will continue to develop and evolve, thus requiring deployment of multiple technologies and the blending of technologies in the classroom. No single solution will solve every need, thus flexible and affordable bandwidth that allows the WTCS to take fullest advantage of the multiple technologies is needed.

A statewide network will facilitate the WTCS meeting its strategic directions (copy attached) and immediate goals to ensure a skilled healthcare workforce, youth options for PreK-12, and provision of courses electronically to the business work site.

Presently the WTCS is engaged in a collaborative effort with all higher education sectors to ensure the availability of adequate skilled health care workers for Wisconsin. The WTCS is currently the largest trainer of health related workers, training 6,700 a year, but the need for additional health care workers is great. Distance education training over a ubiquitous statewide network can be one piece of the puzzle to assist in meeting this need.

WTCS has a long-standing collaborative relationship with the high schools with youth options related courses. Currently the WTCS participates as a full partner with many of the PreK-12 schools and CESA districts in the regional DS3 networks. These partnerships need to continue to be facilitated and improved as technologies evolve. An affordable statewide network that can reach into every classroom will assist the WTCS in partnering with its PreK-12 partners.

WTCS is the education provider of choice by business to keep its workforce skilled and up to date to ensure a competitive Wisconsin business economy. WTCS needs to be able to deliver training to businesses in the most efficient way possible for the business and the WTCS. Distance education to the business work site over a network that is standards based for government and the private sector will help meet this need.

WTCS has recently developed a virtual WTCS online course delivery vehicle, E-Tech College that provides the citizens of Wisconsin a virtual technical college housing the collaborative online courses of the WTCS colleges. This resource is expected to grow to meet the demands for Internet delivered courses. As this growth occurs, it will be important that adequate and affordable bandwidth be available to provide this resource to both the public and private sector.

WTCS colleges are partnering together in deploying common administration systems, which run all aspects of their business operations. In doing so, the WTCS colleges are sharing immense amounts of data, and collaborating continuously by web conferencing and video conferencing. Affordable bandwidth and network alternatives that support these needs will facilitate even more collaboration among the WTCS.

A flexible, affordable, and effective network will greatly assist the WTCS in carrying out its mission responsibilities by allowing it to efficiently collaborate with higher education, secondary education, and private sector partners. Economic development, basic literacy skill, occupational training, and services to high schools can all be facilitated by the WTCS if such a network is procured, built, deployed, and centrally managed. Such a network can also minimize the administrative costs of the WTCS, related to sharing data and programs among campuses and the state agency.

The needs identified in this study mirror many of the needs of the WTCS. If these needs are met, Wisconsin will continue to be a leader in delivering a quality education and lifelong learning opportunities to the citizens of Wisconsin that are seamless across the secondary and post-secondary sectors.

Wisconsin Technical College System Strategic Directions – 2001-2004

1) Position the WTCS as the state's educational leader for workforce solutions

a) Strategies:

- i) Market the WTCS's mission and ability to prepare people for the high skill technical careers that form the core of the new technology-based economy.
 - ii) Create with employers, flexible, timely and portable education and training as solutions to the needs of a fast-paced, changing workplace.
 - iii) Meet the challenge of recruiting and retaining quality teachers and other personnel within the WTCS in the face of expected record numbers of retirements and accelerating employer competition for staff with technical skills.
 - iv) Advocate for adequate funding to fully carry out the mission of the system.
- 2) Increase access and success for all students to expand the state's resource of skilled workers**
- a) Strategies:
 - i) Provide opportunities for young people to learn about technical careers, understand labor market realities, and pursue educational options available at technical colleges.
 - ii) Enhance marketing efforts, emphasizing high skill technical careers, to reach under-served populations, including women, minorities, persons with disabilities, and individuals currently in low skill, low wage jobs.
 - iii) Adopt best practices in student retention, academic support, and other services to help students who are under-prepared or face other barriers to academic success acquire gainful knowledge and skills.
 - iv) Create maximum flexibility in instructional delivery to accommodate lifelong learning needs.
- 3) Foster effective economic development partnerships with education and training providers and business, industry, and labor to increase the skills of Wisconsin's labor force.**
- a) Strategies:
 - i) Promote technical college education as a cost-effective means for career employment, employee skills upgrading, and continuing education throughout life.
 - ii) Collaborate with other education providers to develop new models for easing students' progression on the PK-20 continuum at a pace that focuses on learner readiness, as exemplified in 2+2+2 programs.
 - iii) Create strong alliances of employers, labor and education providers to achieve efficient recognition of learning and transfer of credits between workplace learning and educational institutions. Create flexibility to allow students/workers to step in and step out of formal education.
 - iv) Deliver highest quality customized training and technical assistance to business, industry and labor partners to enhance Wisconsin's economic vitality.
- 4) Extend technical college learning opportunities, improve administrative efficiencies, and empower technical college instructors and students to adopt new teaching and learning strategies through the effective use of technology.**
- a) Strategies:
 - i) Increase the number of Internet and other distance learning offerings to provide educational options for students to learn at the time, place and pace desired.
 - ii) Provide professional development opportunities that prepare faculty and staff to fully utilize technology in delivering instruction and providing services.
 - iii) Make technology training readily available to those preparing to enter the workforce or needing retraining or skill upgrading to address the urgent need for a technologically competent workforce.
 - iv) Implement new technology-based solutions to enhance administrative efficiencies of technical colleges.

The Department of Public Instruction

The Department of Public Instruction's (DPI) first priority is the New Wisconsin Promise—the commitment to ensure the opportunity of a quality education for every child. DPI believes that the Wisconsin Educational Network can help close the achievement gap between economically disadvantaged students or children of color and their peers by providing quality educational resources to every school and library building in the state.

Part of the New Wisconsin Promise is to provide a quality teacher in every classroom, and WENCC's recommendation that all educators be competent users of educational technology aligns perfectly with the ten new PI 34 standards for all teachers (*see below*). Wisconsin colleges and universities with schools of education are currently developing performance objectives with measurement instruments to ensure that new teachers meet all 10 teacher standards including the use of instructional technology.

The PI 34 licensure rules state all teachers must meet 10 standards, two of which involve technology:

- 1) The teacher understands and uses a variety of instructional strategies, **including the use of technology** to encourage children's development of critical thinking, problem solving, and performance skills.
- 2) The teacher **uses effective verbal and nonverbal communication techniques as well as instructional media and technology** to foster active inquiry, collaboration, and supportive interaction in the classroom.

Increasing student achievement is a primary goal of the New Wisconsin Promise and a requirement of the federal "No Child Left Behind Act" (NCLB) of 2001. NCLB's immediate focus is Reading and Mathematics, where all 3rd through 8th grade students will be tested annually. Thus, a major objective of educational technology is to raise student achievement in assessed subject areas. While research strongly suggests this is possible (WestEd, 2002; Marshall, 2002; Schacter 1999), precise methodologies for raising test scores with technology are unclear. The NCLB provides money for a national research effort to identify the conditions under which educational technology is effective in raising student achievement. As effective methodologies are developed, not only can the Wisconsin Educational Network provide the technology; it can also assist in the dissemination of this knowledge to Wisconsin's practicing teachers.

In addition to being an instructional tool, technology is becoming inextricably entwined with other subject areas. It is difficult to do research without using the Internet. Science cannot be done without technological tools. The influential SCANS report from the U.S. Department of Labor in 1991 and its update in 2000 point out that digital technology has changed business, industry, and society in general. Today's students will need a new set of skills to work and thrive in this new century. These skills, often referred to as 21st century Skills, include technological literacy as one critical component.

Wisconsin's Model Academic Standards for Information and Technology Literacy (1998) define what it means to be technologically literate for Wisconsin's students. While there has been significant work by school districts to integrate these standards into the curricula of the four core standards, there has not been widespread assessment of whether students are meeting these standards. In general, by focusing state testing on specific standards in the four core areas and widely publicizing results by school, the curriculum has been focused toward the assessed standards and de-emphasizing the others, including information and technology literacy. Now, however, NCLB establishes as a goal (Title II, Part D) that all students will be technologically literate by the end of 8th grade. We will need a way to measure whether students are meeting this goal by 2006. Technology will need to be a part of the solution.

While it seems mundane to mention that we can no longer work either internally or with our schools, districts, and libraries unless we can communicate with them administratively. These technologies allow use to assist our clients more efficiently and cost-effectively. Technological tools are absolutely essential to measure and record data, collect and report information required by state and federal law, and communicate. Indeed, it is hard to imagine how we could work without the interconnected technology upon which we have become dependent.

The need to develop an informed citizenry with work and life skills goes beyond the classroom. The rate of change requires all citizens to update their skills and knowledge. Public libraries provide access to electronic resources and the Internet to those who do not have access at home or who have slow or inadequate access. As more information is available online, it is crucial that we not exacerbate the digital divide between those with adequate Internet access and those without. All Wisconsin residents have access to free public library service. All except one of Wisconsin's 442 libraries and branches currently offer Internet access. The inclusion of all libraries on the network is imperative for equity of library services to their patrons. Digital technologies allow smaller, more remote libraries to provide information resources and live educational opportunities the same as larger, more urban libraries. The inclusion of libraries in the Wisconsin Educational Network is essential for the lifelong learning required of our citizens.

As we experience the rapid change being driven by technology, it is evident that Wisconsin's students and citizens will need access to technology to develop the skills required to live and work in the present and future. The Wisconsin Educational Network will provide the critical linkages from classrooms and schools and libraries to parents, communities, the state, the nation, and the world.

Department of Public Instruction: Where Does the Network Need to Go?

One of the dominant common themes as the Wisconsin Education Network Collaboration Committee (WENCC) collected information from around the state was the need for equity. Public libraries provide access to electronic resources and the Internet to those who do not have access at home. Most public library access is subsidized in some measure by the TEACH Wisconsin Telecommunications program. Libraries must be included as an integral part of any state digital network.

Similarly, almost all schools have Internet access. In the latest School District Technology Survey, over 92% of Wisconsin's classrooms had at least one Internet-connected computer. Currently, TEACH Wisconsin will provide one data or video line to each of Wisconsin's 426 school districts, juvenile correctional facilities, and a few other educational organizations. Larger school districts can apply for one line for each high school. Districts have extended these lines to individual schools and placed computers in classrooms for Internet access at great cost, even though they have been operating under spending caps since 1993, which was well before the Internet became essential to schools. Some of this funding has been provided by TEACH block grants and wiring loans as well as the federal E-Rate program.

Video distance education classes and resources are currently delivered to about 60% of the high schools, but very few elementary schools, middle schools, and libraries. When technology coordinators and building principals were asked what classrooms would need in the year 2010, the expectation of distance learning with interactive video was the third most mentioned need in the 2002 building principal and district technology surveys. The first two needs were 1) a PDA or laptop for each student and teacher and 2) wireless access. The responses were evenly divided between video at the building, classroom, and desktop level. The library focus group also identified video conferencing as a future need, to provide interactive reference services, for example. As we design the network, it needs to continue to reach all school and library buildings.

Educational Communications Board Strategic Information Technology (I.T.) Plan and the WENCC Recommendations

The Educational Communications Board (ECB) mission, vision and the strategic business and information technology (I.T.) plans support the themes of the Wisconsin Education Network Collaboration Committee (WENCC) proposal.

The mission of the ECB is to provide a statewide telecommunications system that not only provides delivery of public broadcasting but also provides services that respond to the educational and cultural needs of the residents of the state of Wisconsin.

The ECB vision is to ensure that Wisconsin residents have equitable access to telecommunications services and advanced technologies in support of educational goals.

The goals of the ECB Strategic Business and I.T. plans are to provide and deliver enhanced educational programs to both the residents of the state and the PreK-12 schools.

In partnership and collaboration with other organizations involved in educational and cultural initiatives, we plan to accomplish these goals as follows:

- 1) By completing the migration of analog broadcast technology to digital broadcast technology in compliance with FCC broadcasting regulations.
 - a) The completion of the digital conversion will enable the ECB to provide enhanced and diverse educational programs and delivery opportunities to both the residents of the state and the educational community.
- 2) Continue to focus on professional development services using a variety of diverse delivery methodologies to Wisconsin teachers and educators.
 - a) The ECB currently provides professional development and instructional programming to over 54,000 Pre-12 teachers.
- 3) Design and implement effective educational programming using advanced technologies for Wisconsin teachers and educators.
 - a) Continue to collaborate with DPI, the Wisconsin Historical Society, museums, and other educational entities to provide instructional materials for PreK-12 teachers that conform to the state academic standards.
 - i) Assure that ECB educational programming conforms to state academic standards.
 - ii) Continue to evaluate existing ECB programming to ensure agency goals.
- 4) Partner with PBS, NPR and other state agencies using technologies such as datacasting, to provide cost effective delivery of instructional materials.
 - a) Maintain cross-functional teams to investigate new advanced technologies and to address advanced educational needs that involve state academic and professional development issues.

WENCC recommendations are clearly supported by ECB's own goals of addressing equity through its statewide broadcasting and providing curriculum-based programming that supports both classroom learning and professional development. While not offering a two-way network of the type WENCC envisions, ECB's digital broadcast technologies will also equitably support learners throughout the state by transmitting rich media and video content. The WENCC teacher surveys showed that the use of such content in classrooms is very high and will only continue to grow. With the ability to deliver this content to homes and schools as well as distribution points along the WENCC network itself, ECB will allow

learners to take advantage of whichever delivery method is most efficient for them as they act on their expressed desire to learn anywhere, anytime.

As copyright issues are addressed, ECB's conversion to digital broadcasting will also result in the availability of a great deal of digital content already correlated to the Wisconsin Model Academic Standards. This library of rich digital media can help teachers to make further progress toward enhanced learning objectives, a theme identified by WENCC as a key for reaping the benefits of future networks and technologies. ECB's demonstration of the digital media of tomorrow, already garnering national attention, have teachers saying these will effectively help people with many different learning styles—another WENCC goal for realizing the potential of learning networks. Many of these soon-to-be digital resources will also help further the WENCC goal of lifelong learning as broadcast programming addresses the needs of a variety of age groups and learning needs. And ECB's research into how to easily index, find and access digital resources can also support effective classroom use of the wealth of resources that a statewide network would make available.

Educators repeatedly said that ongoing professional development is essential to realizing the classroom potential of the network recommended by WENCC. ECB stands ready to continue supporting such learning by educators with resources such as those offered currently: "Teaching Through Technology," a video series highlighting best practices by teachers, and "Teacherline," an online professional development program focused on assisting teachers in technology use and other areas.

Department of Electronic Government Enterprise IT Plan Supports WENCC Business Plan

The State's Enterprise IT Plan supports WENCC. The Enterprise will:

- Promote economic development by supporting a skilled, technologically sophisticated workforce to attract and keep businesses that create good-paying jobs;
- Prepare Wisconsin's workforce to successfully compete in the digital economy;
- Use technology in the schools to 1) make distance education available to all school districts; 2) encourage schools to use technology to improve student academic performance; 3) integrate technology into curriculum; and 4) eliminate the rural/urban digital divide that limits opportunities for rural residents;
- Coordinate efforts and share technology resources across agencies and other units of government; and
- Provide greater access to resources by creating options for communicating.

Promote Economic Development through a Skilled Workforce

The State's economic development plan, *Build Wisconsin*, is a vision for Wisconsin's future in the digital economy. The Plan focuses on supporting, retaining, expanding and attracting businesses that create good-paying jobs. Technology, in both the public and private sector, plays a critical role in economic development. To encourage economic development in Wisconsin, the use of information and communications technologies will be employed to develop a skilled and technologically sophisticated workforce.

In the Digital Economy, one of the State's most valuable assets is the skill of its workforce. A pool of skilled workers is often the most important factor in selecting a business location. States with a larger share of workers trained and skilled in the use of information technology will do better economically than states with a smaller share.

As all sectors of Wisconsin's economy adopt and integrate technology into their business functions, the demand for workers skilled in information technology will increase. If Wisconsin business is to successfully compete, our children—the workforce of tomorrow, must be exposed to technology and the opportunities it presents.

Use Distance Education, Promote Technology in the Schools and Address Digital Divide

The Department of Electronic Government (DEG) is a full participant in WENCC. The staff is working with the other sponsoring agencies to conduct an educational technology/telecommunication needs assessment for the development of a future migration proposal for a PreK-20 and Lifelong Learning Wisconsin Educational Network. In the same process, the staff is identifying common educational technology/telecommunication applications and academic/administrative needs that could be supported by a future, standards-based Wisconsin Educational Network.

The Enterprise Plan itself calls for:

- providing PreK-12 teachers, administrators and library staff with technical assistance grants to increase the use of technology in curriculum;
- sharing proven techniques from model classrooms to encourage effective integration of technology into curriculum;
- providing the networking necessary to deliver distance learning to schools located in rural communities; and
- participating on the Joint Legislative Council's Committee to eliminate the rural/urban digital divide to ensure that "no child is left behind" in terms of access to technology.

Coordinate Efforts, Share Resources, Provide Greater Access

The Enterprise Plan further supports the WENCC business case by calling for the Enterprise to:

- create policies and standards that ensure economical and efficient use of technology across government resources;
- maximize "economies of scale" advantage by coordinating information technology purchases;
- pursue legislation to allow state residents to engage in legally binding online transactions using digital signatures. A digital signature law will make it possible for Internet users to "sign" documents electronically, expanding the range of transactions they can engage in;
- partner with the Legislature and contributing to the common goal of using technology to make state government more responsive to citizens by updating outdated telecommunications laws, finding new ways to budget for technology and sharing information about the services most appropriate for electronic delivery;
- further develop the Wisconsin.gov portal;
- create and enforce technology standards and eliminate barriers in information technology for people with disabilities; and

- participate in the Joint Legislative Council's Public and Private Broadband Study to determine the extent of the digital divide developing the Wisconsin.gov portal to create and enforce technology standards and eliminate between rural and urban access to high-capacity communications pipelines.

Wisconsin Association of Independent Colleges and Universities

The Wisconsin Association of Independent Colleges and Universities (WAICU) is supportive of the work performed by WENCC.

Participation by private colleges and universities in numerous collaborative ventures involving the UW System, the technical colleges, and PreK-12 schools is widespread. Although the WAICU organizations are not bound by a collective technology plan or common curricula, they are interested in and support the establishment of a standards-based network throughout the state of Wisconsin. Affordability is of paramount importance to private institutions. Universal access with sufficient bandwidth will advance the work of WAICU organizations and extend equal access to all students within the state.

A statewide educational network is essential to the continued development of new and existing educational initiatives including improved cooperation with other institutions, better communications with libraries, and with other governmental entities.

Good teaching with technology requires an informed and technologically competent faculty. Continued education in the uses of technology in teaching and access to the technology are important to all faculties at all levels within the educational environment. Private institutions must continue to obtain the resources necessary to keep faculty abreast of changes within the educational arena. Continued access to funds for continuing education of faculty will provide an informed professorate that will better serve all students.

Many of the WAICU member institutions have significant investments in the current technology through which they offer coursework to other higher educational institutions as well as secondary and elementary schools throughout the state. It is important to continue support of current technologies and provide support for migration to new technologies as they continue to evolve.

Private colleges and universities need to continue providing high quality education to all students through the effective use of technology both within the classroom and across networks within the state. Affordable access to a state-supported network with sufficient bandwidth is essential to keep all Wisconsin students and teachers in the forefront of education within the United States.

TEACH Wisconsin

The TEACH Board is charged with facilitating statewide adoption of educational technology standards. The Board is charged with encouraging the use of internationally recognized standards, specifications, technologies and considering adopting such standards and maximum interaction with other networks throughout the world. The WENCC business case fully supports these initiatives. Implementation of this business case is consistent with the initial mission of TEACH Wisconsin. Furthermore, this business case really allows TEACH Wisconsin to actually insure the barriers of distance and time are removed.

TEACH Wisconsin implements programs that subsidize PreK-20 and public library educational technology, training, and the development of educational technology standards. The primary

mission of TEACH, from its inception on October 14, 1997, has been to accelerate the use of educational technology. Referred to as TEACH Phase I, that first mission has been completed.

The conclusions and recommendations of the WENCC business case are designed to fully accomplish what the Legislature intended. The WENCC business case clearly defines the accurate, long-term educational technology vision of Wisconsin and TEACH Wisconsin: No barriers of distance and time, equal access and opportunity for education for every Wisconsin citizen regardless of their age, where they live in Wisconsin, or in the world.

In 1996 and 1997 when TEACH legislation was being developed, the founders realized that Wisconsin had a huge gap relative to availability of high speed educational networks, Internet access, educational hardware and software, and technology training for educators. The initial mission, to close that gap and eliminate the barriers, was visionary. In 1996 and 1997, the state could not clearly define just how big that gap was, it was known that it was big but there was no way to know then what would really be required to close it. But today we know the answer to that question and this business case is designed to complete the mission.

In narrowing the gap, now, every public school district has access to affordable, high-speed access to the Internet. Every public library that wants high speed Internet access can have it. TEACH also subsidizes private PreK-12 schools', and private colleges and universities Internet access.

Since 1997, we have learned that the boundaries of distance and time are not removed just by installing Internet access or video link service to a school district or a public library. In many cases, there are still schools with very limited access to educational network services. With the use of technology increasing in the actual classrooms, schools need more capacity. As computers continue to move from labs into classrooms, the need for bandwidth capacity grows even more. This is a **good** problem because the change the Legislature sought is taking place. WENCC teacher and administrator surveys conducted reflect priorities in technology capacity and training of educators to use the technology in the classroom as a tool to support the curriculum.

A standards-based statewide education network must be capable of supporting the large list of educational technology classroom applications our educators and librarians use. A standards-based solution is needed to support full collaboration between all Wisconsin educational institutions and educational content providers. The TEACH Board has advocated a standards-based educational technology network capable of supporting multiple educational technologies since its inception. The recommendations in this business case support all TEACH programs and maximize the use on the millions of dollars provided by TEACH block grants to purchase technology.

Glossary

Acceptable Lifecycles	Same as reliable service life.
Asynchronous environment	This term has a lengthy definition with numerous technical implications. However it generally means that a group can communicate interactively without being present together in time and in place.
Backbone Network	The state of Wisconsin has a backbone network or circular configuration that traverses each LATA in WI with access points established where local circuits are run to an access point locally in order to get on the backbone network to get to a far away location. For example a circuit for Superior will go to an access point in Eau Claire. The data gets on the backbone there to ride to an access point in Madison where it gets off the backbone and travels on a local connection to get to the Madison user. It is the same as taking a commuter flight to get to the main terminal where the backbone airlines takes you on the long run to another terminal where you take a commuter flight again to get to the smaller city.
BadgerNet Video Network	State of Wisconsin contract that supports high-quality video classrooms and expires December 5, 2005.
Bandwidth	Generally, in this business case, bandwidth can be thought of as water traveling through a pipe and the amount of water the user needs. The bigger the pipe the more water available. The bigger the pipe the more water the multiple users can draw simultaneously. Conversely, the bigger the pipe the more water that can drain. The more users you have at the end of the pipe, the greater the demand, which can impact how quickly the water can be delivered. As we get more and more users at the ends we need to either somehow compact the information before it gets to the pipe or we just need pipes capable of handling the amount of water we need during low and peak times of use.
Building wiring	Wire installed in a building to facilitate networking.
Connectivity	The ability to connect point A with point B or Point A with A, B, C →
Course Management Systems	Software that provides educators with programs to create courses. For example, online classes. The software is also capable of tracking grades and test scores.
Database	Electronic capture of subject matter or information to be used in a myriad of applications, usually by sorting it and formulating reports.
Desktop Video	Video applications which can be implemented at the desktop on an individual PG for example. This is

	where video is emerging and provides different capabilities vs. having to go to a specific distance education room where all the video equipment is located.
Digital Divide	Term: means some locations have affordable access to technology and others do not; lack of equity.
Distance Education	Process of education where the student(s) and the educator are typically not in the same place. Most often, educational telecommunication technology is the medium of either synchronous or asynchronous collaboration.
Education Technology Classroom	Term: Can be a variety of options but mainly pertains to a location where teaching is performed utilizing educational technology that is physically present and available for students and educators.
Educational Technology	In this business case this pertains to any type of technology that is used in the process of teaching or transportation of information associated with education, academic or administrative. This is a general term covering many applications.
Educator	This is a common term, which in this business case can pertain to PK/12 teacher, Higher Education Professor, Technical College Instructor and their assistants.
Egress Points	Usually a networking term where the data leaves the originating point and travels to the destination, which is an ingress point.
ELearning	Generic term meaning electronic learning often used in place of distance learning. This could involve many different kinds of potential educational teaching applications i.e. video, voice, Internet search, teleconference, etc.
End User	Term: anyone who uses the technology at the point of origin or destination. A teacher using a PC for classroom Internet access is an end user. A person making or taking a telephone call is an end user.
Federal E-Rate Reimbursement	Federal program that a K/12 school can apply for reimbursement of portions of their educational telecommunication expenses.
Full Motion Video	This is a term associated with quality. In this case it relates to the same quality of TV picture as if you were watching the evening news on your home TV.
Global Connectivity	The ability for an end user to make a connection with another entity anywhere in the world be it next door or another country.
Grassroots Need	Basic, core need of someone to perform a function.
High-Speed Access	Term: In this business case it generally means access to the Internet or a data network. High –speed is generic. It means different things to different people depending upon their needs. For a Public Library a

	T1, 1.544 MBPS data speed is very high. For UW Madison it would be inadequate and multiple links of 45 MBPS (million bits per second) would be High-Speed Access.
Intra Campus	Transporting information within a campus, between the buildings and locations of a campus.
IP	Internet Protocol which is a standard.
IP Based Network	General term meaning Internet Protocol standards based network.
ISDN	Integrated Services Digital Network. ISDN provides voice, data and signaling services.
IT	Information Technology.
Legacy System	In this business case, it pertains to video distance education networks that may have been in service for many years. Project Circuit is 20 years old. Quite a few Legacy Systems preceded newer systems. These newer systems may not be compatible with the older or legacy systems.
Local Area Networks	Often called a LAN. The primary purpose is to network (connect or link) computers, printers and shared devices in a building or a group of workers together. Most often cabling (category 5 standard cabling) is used to do this and now fiber optics.
Network	The medium that carries voice, data or video between locations. This can be local, statewide, national, or global.
Network Platform	Platform is the primary word here. Platform usually pertains to a particular technology the network architecture is based upon. That is the kind of technology or medium moving the information between points.
Networking	A term used relating to tying things together.
No Child Left Behind Act	The No Child Left Behind (NCLB) Act of 2001, signed into law January 8, 2002, is the reauthorization of the federal Elementary and Secondary Education Act enacted in 1965. It defines the federal role in K-12 education and is a compilation of numerous federal grants and programs. It is based on four basic principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on proven teaching methods.
PI 34 Education Program Approval and License Rules	The recently enacted PI 34 Education Program Approval and License Rules restructure teacher education, educator licensing, and professional development for educators in Wisconsin. The new system is based on the Wisconsin Standards requiring demonstrated knowledge, skills, and dispositions for teaching, pupil services, and

	administration. Initial licensing and license renewal will be based on an educator's successful performance as measured against these standards.
Procurement	Term: process in government used to purchase equipment or services.
Reliable Service Life	Term: Even in the environment of quickly changing technology, hardware, software and other equipment have a useful life, regardless of change, for a period that allows the purchaser to obtain the full value for the reason it was purchased. For example, a BETA VCR will still show a video; but a newer technology, which does the same thing, replaced it years ago. Many products purchased by PK/20+Libraries can be used for years to come. The most common element that supports them is a data network. As long as they are compatible with the network, they have a reliable service life.
Standards Based Network	Communication industry term, which, in this business case, relates to a common network, capable of supporting common applications, based on standards supporting global commonality.
Statewide Distance Education Network	In this business case, it is the primary term that will relate to a standards based voice, data and video network that can support all educational users. The network ideally would also be capable of supporting state business.
Synchronous Learning	In this essence it pertains to communication primarily being one way. Computers communicate with a mainframe synchronously. Typically an interactive video call would not be done synchronously. This type of transmission would be like a broadcast to many possible locations or just one with no response intended to come back from the viewer.
System Access	This means one has access to a system, it is generic relative to what kind of system.
TEACH	Technology for Educational Achievement (TEACH) Wisconsin provides support for investments in educational technology and telecommunications. Wisconsin's schools, libraries, cooperative educational service agencies (CESA), charter schools, secured juvenile correctional facilities, private colleges, tribal colleges, and technical colleges are all served by TEACH.
TEACH Video Link	A TEACH eligible entity can request a video link provided through the state video contract. TEACH pays for the entire cost of the service which can be several hundred thousand dollars and TEACH bills the school \$250 a month through 12/05/05.
Tektronix Video Network	The proprietary name of the manufacturer who built

	and sold the video platform equipment for the current BadgerNet video contract and the common term people use to relate to that network.
Telecommunication	Communication that take place over a distance. This does not relate only to telephone networks, which is a common misconception.
Telecommunications Access Program (TEACH)	TEACH Wisconsin offers state networked Video Link services to eligible applicants at a monthly price of \$250. TEACH Wisconsin basic video service includes spare capacity for a 1.544Mbps data line circuit that can be used for Internet access in most cases. The system is designed to accommodate daily connections for users connected to the locally installed video switch.
Telecommunications Access Service	Voice, data or video accesses to a network. The network can be public, private or it can be the Internet. Private networks can apply to many different situations but is primarily looked upon, as the point where data or information leaves the originators hand and has to telecommute to get where it is being sent.
Upgrade	Term: In this case means that a technology or software can be changed to newer versions without having to throw them away and starting over from scratch.
Upgradeable	Term which means that a technology can be modified with an upgrade to do more applications, meet new standards or become more efficient. The point is the initial investment is protected because changes do not make the item automatically become obsolete or unusable.
Video	Video adds the element of sight to communications.
Video Network	Universal term. It can mean a cluster of video partners sharing their own network or it could be hundreds of users sharing a common network. This generic term does not associate it with any particular technology.
Videoconferencing	Conducting a meeting between distant locations with an interactive audio and video signal. There are many technologies and levels of quality and ways to do video conferencing. This is a generic term.
Virtual Learning Communities	A group of people learning together via the web, not in a classroom.
Wide Area Networks	WAN. Same principal as a LAN however buildings are linked by wide area networks. Quite often used in a campus environment.
Wisconsin Economic Development Plan	The State of Wisconsin Plan that supports development of Wisconsin competition in the global marketplace and also attracts business to Wisconsin.
Wisconsin Education Industry Investment	The money spent on purchasing technology, or

	services, or training that has formed the educational technology infrastructure for the State of Wisconsin.
Wisconsin Universal Service Fund	Established by the Public Service Commission, this fund is assessed upon telecommunication (telephone companies primarily) for a variety of public policy support issues. TEACH telecommunication access programs are paid for by assessments from this fund paid to the telephone companies by their customers.



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