University and Community College System of Nevada Strategic Technology Planning for the 21st Century

Compiled by the UCCSN Information Technology Council - DRAFT April 21, 2000

Introduction
Strategic planning for technology is a continuous process shaped by the Board of Regents' strategic directions, each UCCSN institution's mission and goals, the state's priorities, and the technologies themselves. This current planning process is based on: the Regents' *Strategic Directions for the University and Community College System of Nevada* , information technology plans developed by UCCSN campuses in the spring of 1998, and current technologies proposed by the computing and networking professionals in each institution and within System Computing Services.

Common goals run throughout the Regents' strategic directions, the campus plans, and the System plans: **access for students, institutional growth and vitality, instructional and research excellence, effective administrative processes, and service to the state**.

Common technology themes that address those goals include: **statewide, around-the-clock electronic availability of instruction and student services; professional development and support for instructors; computation and network tools for researchers; accessible, reliable campus and central administrative information technology; robust network capacity within and among Nevada's educational institutions; and connections to the Internet and national research networks** .

Overview
Section I, <u>Board of Regents Strategic Directions for the UCCSN</u>, summarizes the Regents' goals for the UCCSN and relates technology objectives to those goals.

Section II, <u>Strategic Technology Objectives for the UCCSN</u>, outlines system-wide comprehensive technology objectives for today and approximately the next two biennia.

Section III, <u>Achieving Technology Objectives</u>, identifies strategies for achieving technology objectives, with emphasis on establishing a stable funding base for technology, assessing outcomes, and a regular reexamination of objectives and strategies.

Section IV, <u>Institutional and System Plans</u>, provides World Wide Web links to the information technology plans and vision statements of the seven UCCSN institutions and System Computing Services. (Printed individual plans are available on request.)

I. Board of Regents Strategic Directions for the UCCSN
   The Board of Regents has identified three *end goals* to define where the UCCSN should be in the future. The **bold sections** briefly summarize the Regents' goals and the <u>underlined material</u> relates to technology-based initiatives that support the goal.
   1. Undergraduate Access and Growth
      Provide programs and support services that are accessible to Nevada students. Remove barriers to educational opportunities so that more Nevadans can benefit from post-secondary education. Ensure that education is of the highest quality.

      <u>Accessibility</u> - Increase statewide 24-hour electronic course delivery and support services via Internet, desktop and interactive video, satellite, TV, and ITFS. Develop web-based programs and services.

      <u>Growth</u> - Build ties to K-12 students through electronic courseware, shared technology

centers, Internet and video connectivity.

Education quality - Provide professional development and technology support for staff. Provide tools for incorporating technology into on-campus and remote courses.

2. Research and Graduate/Professional Education
Provide access to high quality graduate and professional education opportunities. Encourage vigorous research programs that serve the state, maintain academic stature, attract excellent faculty and students, and enhance both graduate and undergraduate experiences.

Research - Provide connections to national high-speed research networks for access to national research labs, opportunities for statewide, national and international collaborative research, and eligibility for private and public grant funding. Provide high-end and mid-range computation tools.

Graduate/Professional Education - Provide network infrastructure and instructional tools for statewide teacher recertification and distance education training in numerous fields. Enrich graduate and professional programs with courses not locally available. Provide technology tools on campuses to maintain currency in professional training.

3. Meeting State Needs
Provide benefits to the state in economic diversification through a trained workforce, research revenue, statewide health services, teacher training, education standards reform, and access to lifelong learning. Partner with K-12, state and federal agencies and industry to maximize technological investments.

Statewide Network Infrastructure - Enable distance education, statewide conferencing, research collaboration, access to data, medical education and consultation, and a variety of collaborative information exchanges with state agencies through a robust statewide educational network.

Distance Education - Make use of a variety of electronic media to provide multi-level educational and training opportunities throughout the state independent of location or time of day.

Partnerships with Industry and Government Agencies - Work with other agencies in computing, networking and information technology collaborations to efficiently utilize technological resources.

The Regents also identified five *means goals* : **Accountability, Planning, Resources, Technology, and Productivity.**

Accountability and Planning depend heavily on accurate, accessible, relevant information systems. Planned individual campus administrative system development and System Computing Services development will improve access to data and tools for analyzing and disseminating it.

Resources such as faculty, facilities, infrastructure, and time will be efficiently used through distance education, shared technology centers, video conferencing, electronic collaboration, data warehouses, web-based services and other technological solutions.

Technology is the focus of this planning effort, which focuses on how technology can

best be used to serve the state of Nevada and its educational requirements.

Productivity in instruction, research and administration is affected by technology development in many ways. Numbers of students served and quality of instruction are driving forces behind each campus plan to incorporate more distance education and more on-campus technology into the curriculum. Electronic student services are essential for growth in student populations. Research brings dollars into the state and solutions to society's problems. Research productivity is dependent on access to technological tools, to information and to colleagues. The most essential research tool today is access to very large amounts of network bandwidth. Increased administrative productivity, as well as improved levels of service, can be obtained through office automation, data warehousing, web-based access to information and a variety of other technical solutions proposed in this plan. An important caveat in the relationship between technology and productivity is that, while technology has the potential to improve service quality and quantity, it does not reduce costs.

II. Strategic Technology Objectives for the UCCSN

1. Increase Access to Instruction.
   The UCCSN will use technology to increase statewide, around-the-clock access to instruction and to enhance instruction both on and off-campus. Every institution has plans to increase the integration of new technologies into instruction. Both on-campus and remote courses are evolving as new techniques and delivery methods are incorporated. The distinction between remote and on-campus courses will become blurred as courses use technology-enhanced classrooms and incorporate web-based exercises and research. Courses will be delivered via the interactive video, ITFS, satellite, TV, videotape, desktop video, and the World Wide Web to a variety of locations.

   The goal is to provide online educational opportunities to students throughout the state regardless of their location or schedule. Examples of programs that institutions plan to deliver via distance education include: associate, bachelor and select masters degree programs, allied health and nursing education, workforce training, social sciences, teacher recertification, teacher professional development, college level courses to high schools, correspondence courses, and instruction delivered to UCCSN students at school, work and home.

2. Increase Access to Student Services.
   Recognizing that serving students goes beyond providing instruction, the UCCSN will support student population growth and changing student needs by providing 24-hour access to web-based student services. A number of services are already available online, such as library access and web-based student registration. Work is underway to upgrade the core student information software to one that provides easier access to data, flexible program maintenance, and web interfaces. Institutions are adding campus services and customizations.

   Examples of planned student services to be developed include virtual faculty office hours, online financial aid applications, online bookstores, purchase of parking permits, payment of fines, procurement of transcripts, and online catalogs.

3. Enhance Instructional Excellence Through Technology Training and Support.
   The UCCSN will provide technology support, training, and professional development for faculty, staff, and students to integrate technology successfully into curricula. To achieve the maximum benefits from investments in hardware, software and networks,

corresponding investments must be made in personnel and training.

Web-based courses require instructional designers, webmasters, help desk personnel, lab support, and trainers. Technology-based instruction requires network and classroom infrastructure and technical staff. As technology use increases, so does the need for support personnel.

4. Enhance Research and Professional Education.
The UCCSN will support research and professional education through enhanced networks, access to capable computing resources and expanded use of distance education. Research excellence depends on the UCCSN's ability to recruit capable research faculty, equip them with the tools necessary to fund and conduct their research, and provide research opportunities for graduate and undergraduate students. All of these are dependent on providing robust, up-to-date technology. Today's researchers require high-speed connections to national research networks for collaboration with colleagues, access to national research facilities and eligibility for research grants. They also require access to mid-range and high-end servers for tasks like computer modeling and computation.

Work is underway to expand traditional professional education through distance education and to offer distance and on-campus training in the technology required in modern industries. Teacher education is needed throughout the state. Network design and management training is greatly in demand. Medical education is already heavily reliant on technology. Telemedicine services (professional development and medical consultation) are especially useful in Nevada's rural areas.

5. Provide Reliable, Secure, Effective Administrative Processes.
The UCCSN will provide system-wide computer information systems for reliable, secure and effective access to system and institutional data. Planning, management, accountability, and productivity are dependent upon accessible, accurate data and effective tools for analysis and reporting.

The current strategy for administrative information systems calls for System Computing Services to provide core applications for system-wide student information, human resources and financial processing and to develop a data warehouse for the analysis and reporting of selected system-wide data.

Campuses are using data warehouse technology to develop institutional administrative systems to make their data more accessible and to perform a wide variety of tasks, such as presenting financial data in varied formats, tracking and linking personnel and student data, scheduling classrooms, using electronic forms and many other specialized applications. Significant progress has been made in providing tools for reporting and analysis. Increased web access is planned for both institutional and core administrative systems.

Adequate processing capacity, data security and reliability are essential elements for critical administrative information systems. Population growth, web access and new software capability place ever-increasing loads on core and campus computer systems. For example, the UCCSN experienced warning signals when newly implemented web registration loads in January 1999 brought systems to a halt until processing capacity was increased. Secure access to data is an ongoing goal. Security procedures will be reevaluated regularly as new methods become available and technical environments change. SCS will continue to evaluate the incorporation of newer technologies, such as

relational databases, object-oriented technologies, and web-based architecture, into core applications.

Lastly, but of great importance, System Computing Services and campus units must ensure that critical administrative information functions continue in the event of a disaster. Failure to provide reliability, security or adequate capacity impacts all of UCCSN - students, faculty, staff and the overall mission.

6. Provide Sufficient Bandwidth to Accommodate Instructional, Research, and Administrative Objectives.
All of the objectives detailed above are dependent on robust connectivity within and among the UCCSN campuses throughout the state and on capable connections to national networks.

The UCCSN will provide sufficient network bandwidth to accommodate the instructional, research, and administrative objectives of the UCCSN. This will require regular, substantial increases in bandwidth. Campuses will continue to enhance local campus networks, and System Computing Services will support and enhance the statewide NevadaNet backbone and will continue to research and implement new technologies that deliver more reliable and efficient connectivity. SCS will support growth in video network switching and connectivity and investigate new technologies to accommodate distance education and video conferencing. Recognizing that research connectivity needs for bandwidth far exceed instructional and administrative uses, the UCCSN will connect Nevada's researchers throughout the state and to the national research networks.

The UCCSN will continue to explore opportunities to establish telecommunications partnerships with businesses and with state and federal agencies and to investigate creative ways to fund connectivity.

III. Achieving Technology Objectives
1. Establish A Stable Funding Strategy for Technology.
Primary to all of the UCCSN's technology objectives is the need to establish a stable funding strategy for technology. Technology needs to grow as the student population grows, as technology is integrated more fully and creatively into higher education, and as the available technologies become more functional and demand more resources. At present there are no ongoing budget allocations for technology and no means for expanding funding commensurate with need. Technology development has been funded with one-time enhancements, reallocations of funds allocated for other purposes and, most recently, with Estate Tax funds.

Technology cannot be supported with one-time, as-available funding. Technology infrastructure, such as technology-enhanced classrooms, computers, software, and networks, as well as maintenance contracts, support personnel, travel and training, require ongoing, reliable funding sources. Technology support is as essential to UCCSN success as it is to business and industry, and must be funded in a way that allows for planning, cost projection, development and ongoing support.

Therefore it is a primary goal for the UCCSN to do whatever is necessary to establish a strategy for funding technology at institutional and system levels. It is assumed this will require investigation into how other higher education institutions fund technology and will be integrated into the statewide efforts underway to reevaluate funding for higher education in general.

2. Assess Outcomes and Reexamine Objectives and Strategies Regularly. Institutions and the UCCSN System Administration should establish strategies for assessing progress toward stated technology objectives. Quantitative measures could include faculty use of technology, distance education offerings, available student services, student FTE increases attributable to network delivered courses, increases in research collaborations, increases in research grants attributable to high speed network access, increases in administrative processes per day, increases in available bandwidth, ratio of technology support personnel to staff, budget allocations for technology and numerous other measurable elements. Qualitative measures will be more difficult, but perhaps not impossible, to identify. The Campus Technology Officers could coordinate this effort. Baseline measures should be established as soon as possible for meaningful reporting. Selecting measurements used by other higher education institutions might be helpful in evaluating UCCSN performance and comparing with other states and institutions.

Informal assessment is already in place through the regular business of various committees dealing with administrative information applications, campus computing services, distance education, academic affairs, research, and network connectivity. These groups should be polled about how to assess progress in the implementation of information technology strategies in their areas of expertise. User groups are also important in the process of reexamining objectives and strategies.

The UCCSN should put in place a procedure for the regular review of objectives and strategies. The review should start with the current directions set by the Board of Regents, continue with each institution's current vision and goals for technology and System Computing Services' current objectives, include assessments of how current technologies are succeeding, and undergo a review of assumptions and plans.

IV. Institutional and System Plans
Each UCCSN institution and SCS developed information technology plans in the spring of 1998. They may be viewed on campus web sites.

Community College of Southern Nevada
Desert Research Institute
Great Basin Community College
Truckee Meadows Community College
University of Nevada Las Vegas
University of Nevada Reno
Western Nevada Community College
System Computing Services