**Working Draft 1**

# Information Technology Strategy Project, Phase 2
# Environmental Statement

The purpose of this document is to serve as the first working draft of an environmental statement encompassing state, national, and international trends as well as specific issues often associated with information technology. We hope that faculty, staff, students, administrators, and others concerned with the future of the University of North Carolina (UNC) will offer constructive suggestions for this document.

## Background

At the March 13, 1998, Board of Governors meeting, UNC President Molly Broad announced the initiation of the Information Technology Strategy (ITS) project. This strategic planning effort, led by the UNC chancellors, will enable UNC's 16 constituent institutions to address the critical role of information technology (IT) in advancing their missions and goals as we enter the 21st century.

The planning process is divided into two phases. Phase 1 (March - July 1998) focused on developing the vision and goals that will guide the use of information technology within the University. The vision supports UNC's overall mission and goals, as well as efforts by each of the campuses to develop its own program-driven IT vision and plan. Also in Phase 1, teams of network specialists assessed the current network infrastructure and estimated the cost of bringing all UNC campuses to new baseline standards for network connectivity. In response to the UNC Board of Governors' request for $77.5 million to meet these standards, the General Assembly provided approximately $35 million to begin the implementation. These efforts serve as a foundation for the work of Phase 2.

During the second phase of the ITS planning project (November 1998 - June 1999), campus groups will collaborate to define a set of common IT challenges facing all of our campuses and develop initiatives to address those needs. This will require the widespread involvement of faculty, students, staff, and others to propose and evaluate potential IT investments in support of teaching and learning, research, public service, and administration. It will also entail an assessment of the non-network IT infrastructure (hardware, software, training, and technical support) needed to implement the key ITS initiatives.

The ultimate implementation will take place at the campus level, where institutional missions and needs will determine the details of each project.

## Information Technology Vision

As the State of North Carolina enters the Information Age, technology is having a dramatic, long-term impact on quality of life, economic competitiveness, regional development, and equity among social groups. The emerging knowledge revolution is creating unique opportunities and problems that require new thinking, bold action, and continuous effort to improve and innovate. In this environment, the University of North Carolina and its constituent institutions must be leaders in the effective use of information technology to ensure that all North Carolina citizens and regions prosper in the 21st century.

To meet this challenge, the University of North Carolina and its constituent institutions must achieve the following goals:

- ***Student Success:*** UNC students must become effective knowledge workers and lifelong learners who use information technology to create, discover, represent, and share knowledge.
- ***Access and Outreach:*** UNC must use information technology and engage in vigorous outreach to link North Carolina citizens, businesses, and communities to the educational resources, programs, and intellectual capital they need to be successful.
- ***Academic Excellence:*** UNC faculty and staff must be innovative users of information technology in order to provide affordable, high-quality learning and teaching, to support leading-edge research, and to deliver effective and efficient administrative and student services.
- ***Learning Relationships:*** UNC must enhance the learning experience by using information technology to strengthen relationships between and among faculty and students.
- ***Global Information Resources:*** Students, faculty, staff, and the community at large must be able to access, evaluate, and exchange information across campuses and around the world.

While the campuses have already made substantial investments in information technology, the pace of the knowledge revolution is rapidly encroaching on these investments. Therefore, in order to realize the greatest value from its information technology investments, UNC will adhere to the following principles:

- ***Outcome-Focused Investments:*** UNC's information technology investments will be driven by clearly defined and regularly assessed institutional and programmatic outcomes.
- ***Value-Driven Funding:*** UNC institutions will attract levels of public and private investment for information technology that recognize the critical value these institutions provide to the state and nation.
- ***Partnerships:*** UNC institutions will collaborate with all education sectors (e.g., K-12 and community colleges), private industry, and the state to leverage information technology to provide North Carolina citizens with high-quality, lifelong educational experiences.

- ***Effective Balance of Equipment and Support:*** All UNC campuses will balance information technology infrastructure with training and support to best meet the needs of students, faculty, and staff.

## Defining Trends of the 21st Century

There are several defining trends of the 21st century. Among them are demographic changes, educational access, globalization, new models for education, information technology, and the pace of change.

- Education is of critical importance to society. It is closely associated with individual income, economic growth, a stable and democratic society, as well as quality of life. However, worldwide population growth is outpacing the capacity to give people access to education. Universities in the United States are expected to play an increasingly important role in providing global information resources to support educational activities.

- The economy has shifted from high-volume production of physical goods to the provision of services that depend upon highly developed information resources and skilled workers. This shift is also underway worldwide, affecting our exports and our role in the information-based world trade structure of the future.

- Overall, North Americans represent an aging population and one that is shrinking compared to the rest of the world's population. Individuals are working longer, they are making more career changes, and those career changes often require additional education.

- Our world is interconnected. Although we often associate globalization with competition, it is also about interdependence. We are being challenged to redefine success in this global economy in terms of brainpower rather than natural resources, energy, or manufacturing. Graduates from American universities will cooperate and compete with their peers worldwide.

- New institutional models are emerging—for-profit and proprietary institutions, "educational brokerages," clearinghouses and certification agencies. Curricular models have changed as well. Problem-based learning, collaboration, teamwork, and asynchronous learning are becoming increasingly common.

- Continuous learning is a hallmark of careers in the new economy. No two-year or four-year (or five- or ten-year) college or university program will ever produce a fully and permanently qualified professional. Few can anticipate what competencies or skills they will need a few months or years from today.

- Advances in telecommunications, computing, and collaboration are merging to create a networking revolution that is changing how we live, work, and educate. It is changing the expectations of our constituents (students, parents, citizens) for facilities, access, service, and support.

- The pace of change has become a dominant theme in both society and business. Success in this environment is increasingly dependent upon continuous investments in education, information technology, and knowledge management capabilities. Keeping pace with this rate of change is a becoming a defining feature of success for citizens and companies, as well as colleges and universities.

## Defining Trends in North Carolina

### *Demographic*

North Carolina had one of the nation's fastest growing populations during this decade, a trend that is expected to continue. The Census Bureau projects that the state will have the nation's seventh largest population gain over the next 25 years. During that period, North Carolina is expected to rank third in the nation in the amount of population growth resulting from in-migration from other states. Despite this growth, North Carolina continues to have one of the largest rural populations in the nation (as defined by the Census Bureau), ranking third in the nation in overall number of rural residents.

These population trends are closely related to changes in the state's economy in recent decades, changes which have led to differential population and economic growth in various areas of the state. For instance, the Northeast economic development region of the state (one of seven regions) had less than a 5 percent increase in population from 1990-1995, compared to growth of almost 18 percent in the Research Triangle economic development region. This population growth difference is related to regional differences in transitioning to the new knowledge-based economy—about 30 percent of all high technology jobs in the state are located in the Research Triangle region compared to only 1.5 percent in the Northeast region.

There are several implications from these demographic trends for information technology development among University of North Carolina campuses. The University must maintain its leading position in information technology currency and innovation in order to continue serving as an effective partner and resource for the high-tech, high-paying industries that the state seeks to attract and retain. As businesses and industries of all types increasingly become technologically sophisticated, all of the state's education sectors must work together to provide the education and skills that North Carolinians need to be successful in the knowledge-based, IT-driven economy. Further, the state's overall prosperity will be threatened unless innovative approaches are developed to offer higher education opportunities to citizens in isolated and rural areas that are economically dormant.

***Enrollment***

UNC's ten-year, system-wide fall headcount enrollment projections (based on historical UNC attendance rates and projected growth in high school graduates and overall population) suggest that on-campus enrollment demand could grow by 30.7 percent from 1998 to 2008, an increase of about 47,600 students. When this projection is compared to the system's fall headcount growth in the preceding 10 years (13 percent from 1988 to 1998—17,789 students), it is obvious that innovative approaches to delivering higher education in the state must be developed to accommodate this increased demand. In addition, increased UNC attendance rates for women, minority students, and nontraditional students in recent decades indicate the growing diversity that will characterize the University's student population for the foreseeable future.

Beyond the anticipated strain on UNC's capacity to accommodate these additional on-campus students, the evolving information economy will create greater demand for delivery of higher education at a distance. Technological innovations in distance education are developing at a rapid pace, and as access to such technology becomes more affordable, citizens throughout the state will increasingly request higher education distance learning opportunities. Strategies for addressing this anticipated enrollment demand must depend in part on advances in information technology for delivery of both on- and off-campus educational programs.

***Economic***

North Carolina has had a robust economy in recent years with its average annual growth rate of 6 percent, about 1 percent higher than the national average. Steady gains in per capita personal income and an historically low unemployment rate have accompanied this progress, along with the development of new industries in some areas and high in-migration of workers from other states.

Nevertheless, there are indications that UNC has an important role to play in ensuring that this prosperity is sustained and extended to all of the state's citizens. Despite declines in overall poverty rates, the percentage of the state's children (age 17 or younger) living in poverty has increased to about 20 percent—one reason for the state's dramatic increases in Medicaid expenditures over the last 10 years (18.7 percent annual growth). Further, as the "Baby Boom" generation reaches retirement age, the state's dependency ratio will rapidly increase. The dependency ratio, representing the number of youth (under age 20) and elderly (age 65 or over) compared to the number of "working age" adults, is projected by the Census Bureau to increase from 67.1 percent in 1995 to 80.6 percent in 2025.

The implications of these trends are that a smaller percentage of North Carolina's population will generate the taxes to pay for state services in the future and that the needs of the young and the elderly will place increased demands on state resources. The challenge to the University of North Carolina in coming years will be to justify the state's investment by extending the benefits of

higher education, including research and service, to all of the state's citizens through cost-effective innovations and creative strategies that address the needs of North Carolina.

***Legislative***

For the University's current planning period of 1998-2003, the Board of Governors has selected six interrelated strategic directions that are consistent with and supportive of those priorities for higher education articulated by the state's political leadership over the last decade:

- Expand access to higher education for both traditional and nontraditional students;
- Preserve and heighten the excellence and competitiveness of the University of North Carolina;
- Improve the quality of education on-campus and off-campus;
- Identify and implement the most promising applications of technology;
- Promote increased efficiency and effectiveness in the use of University resources; and
- Continue to propose and support initiatives to serve the needs of the state's public schools.

The University's planning document, *Long-Range Planning: 1998-2003*, lists a number of ways in which the coordinated and efficient application of information technology plays an important role in each of the above strategies, including:

- Expansion of off-campus instruction sites and distance education courses and programs to enhance outreach to nontraditional, place-bound, and time-bound students;
- Improved services to facilitate enrollment and support the educational experiences of off-campus and distance education students;
- Increased collaboration among constituent institutions and with other education sectors in facilitating access for all North Carolinians to the state's educational resources (e.g., exchange of distance learning courses and establishment of a North Carolina virtual library [NC LIVE]);
- Satisfactory access to library resources and services, both traditional and technology-based;
- Satisfactory access to information technology resources and services and to laboratory resources;
- Ready access to worldwide sources of information;
- Development of graduates able to use technology effectively;
- Improvement in the ability of General Administration to collect, process, and analyze University-wide data for accountability and assessment; and
- Assistance to public schools in the use of new teaching technologies.

The 1998 reconvened session of the General Assembly (Senate Bill 1366) demonstrated its concurrence with the above priorities by providing funding for distance education, campus information technology needs, library technological services, and outreach to the public schools utilizing information technology.

## Questions to Consider

As we develop the information technology strategy for UNC and its constituent institutions, there are a number of questions we must ask ourselves.

### *About instructional computing*

It is increasingly common for information technology to be incorporated into the curriculum. Instructional computing can range from adequate projection/demonstration facilities in a classroom to individual student access to computers.

- As the institution encourages the adoption of new instructional methods, what kinds of education and support should be provided for curriculum design? For instructional design? For technical support?
- What types of support should be provided to students who are using information technology and instructional software?
- What are the implications of the application of instructional technology to planning new classrooms or renovating existing ones?
- How should the demands for instructional technology in the classroom (e.g., multimedia classrooms) be prioritized and funded? How should such facilities be maintained and upgraded?
- How can the institution ensure equitable access to information technology for all students, irrespective of income, living on- or off-campus, and with full-time or part-time status?
- What kinds of dedicated computer labs should the campus maintain?
- What forms of user support do faculty and students require (e.g., help desks, support staff)?
- Are we using information technology to provide us with a global perspective (e.g., interacting with students from other countries and cultures)?
- Are we making sufficient progress in information technologies to keep our institution competitively positioned to attract students, faculty, and staff?

### *About student-faculty relationships*

Learning is a social process. We know that students learn more when there is more interaction—between students and faculty, among students, or between students and mentors. Many are using the Internet and World Wide Web to increase opportunities for interaction, as well as access to information.

- Are we using information technology to improve the interaction among faculty and students?
- Do our faculty have ready access to adequate and timely information about students necessary for supporting their learning and personal growth?

***About student services***

Student services encompass dozens of activities that can affect student satisfaction, retention, and success. Students expect high quality service and a student-centered environment.

- Are we meeting (or exceeding) the expectations of our students related to service quality, timeliness, responsiveness, and access?
- Do we have a learner-centered service organization with cross-trained staff capable of handling students' issues and questions in one location?
- Are resources allocated to the activities that are most highly valued by our students and most contribute to their retention and overall satisfaction?
- Do we have a single, integrated student services database?

***About libraries***

Libraries often provide the largest "mission critical" IT application on a campus. In addition, libraries are often responsible for leadership in turning information technology into information resources.

- Considering that libraries are sometimes responsible for the largest information systems on campus, how should the institution support the maintenance, growth, and evolution of the library?
- What policies should libraries follow for the acquisition of materials in digital formats?
- Are there economies of scale (e.g., buying cooperatives, preferential pricing), beyond what is already being done, that are possible for the UNC libraries?
- What are the implications of information technology for planning new and renovated library space?
- What is the role of the library in supporting faculty and student use of information technology (e.g., access, quality control)?

***About research computing***

Research often depends on access to high-performance computing, high-speed networks, and state-of-the-art technology. Research computing can vary widely depending on the discipline and whether research is sponsored or unsponsored.

- How should we balance the need for project-specific, state-of-the-art technology that supports world-class research with institutional interests in standards that manage costs and improve service?
- Although grants often provide acquisition funds, they may not provide funds to maintain hardware and software. How should the institution work with researchers to build the infrastructure while simultaneously providing on-going support?

- How should the institution develop a flexible approach to planning, acquisition, and support considering that research IT needs vary across disciplines?
- How should the institution support the high bandwidth capabilities and electronic collaboration among colleagues that are rapidly becoming necessities in research?

***About outreach***

As public institutions, we have a responsibility to make the collective knowledge and experience of our campuses available to individuals and the community. The importance of outreach is increasing with the information explosion and the knowledge economy.

- Are we using information technology to allow us to reach citizens and other constituents more effectively and efficiently?
- Are we using information technology to allow more individuals on our campuses to provide outreach to the state, the nation, and the global community?
- Are we using information technology to allow professionals and the community to interact with individuals and programs on our campuses?

***About inter-institutional collaboration***

The last decade has seen a significant increase in multi-disciplinary work as well as inter-institutional collaboration. We have the opportunity to examine when and how we can collaborate to improve quality and to conserve effort.

- How can campuses use information technology to support the development of collaborative distance learning degree-credit programs offered by more than one campus?
- What types and combinations of centrally provided and campus-provided technology services should be available to faculty and students?
- How can campuses coordinate implementation of distance learning technology with distance learning partners and recipients, such as the community colleges and public schools?
- What other academic or administrative issues present common IT challenges amenable to common IT solutions? What organizational structures are necessary to support effective institutional collaborations in these areas?

***About administrative computing***

A new generation of client/server administrative computing applications—student information systems, human resources, financial, etc.—are being developed. These applications may offer us the opportunity to ensure that administrative computing is user-friendly and guided by the institution's strategic priorities.

- As campuses select new administrative computing applications for student services, research administration, human resources, etc., can a system-wide initiative be advantageous to them?
- Is the institution taking advantage of e-business opportunities (e.g., use of electronic data interchange [EDI] for billing) to make administrative processes more efficient?
- Is the institution developing "knowledge warehousing" and analytical capabilities that will facilitate decision-making?
- Are imaging technologies being considered to reduce lost paperwork, increase access, and reduce storage space requirements?
- Do we know what skills and competencies are required in our changing environment and have we ensured that our employees have the necessary skills, competencies, and IT tools?