

# **BUILDING ON EXCELLENCE**

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# Building on Excellence



**The University Plan**  
**Duke University**  
**February 23, 2001**

## The Mission of Duke University

James B. Duke's founding Indenture of Duke University directed the members of the University to "provide real leadership in the educational world" by choosing individuals of "outstanding character, ability and vision" to serve as its officers, trustees and faculty; by carefully selecting students of "character, determination and application;" and by pursuing those areas of teaching and scholarship that would "most help to develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to promote an intellectual environment built on a commitment to free and open inquiry; to help those who suffer, cure disease, and promote health, through sophisticated medical research and thoughtful patient care; to provide wide ranging educational opportunities, on and beyond our campuses, for traditional students, active professionals and life-long learners using the power of information technologies; and to promote a deep appreciation for the range of human difference and potential, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the University; to contribute in diverse ways to the local community, the state, the nation and the world; and to attain and maintain a place of real leadership in all that we do.

Approved by the Duke University Board of Trustees, October 1, 1994.  
Revised February 23, 2001.

*To the Memory of Tommy Langford, Charles Putman and Wes Magat:*

*They stood for excellence; they built community.*

## INTRODUCTION

### DUKE'S SIGNATURE IN AMERICAN HIGHER EDUCATION

The purpose of this introductory essay is to provide a broad context for considering the carefully crafted and intellectually exciting initiatives outlined in the academic plan described in the following pages. Before we turn to these specific initiatives, it is useful to situate our high ambitions and bold goals in the context of American higher education and the particular traditions of Duke University. Above all, this introduction is intended to remind us of the ultimate ends and values that motivate our collective efforts and that must ultimately provide the touchstone for measuring our success. Duke has been blessed in the past by far-sighted, effective leaders attuned to these values; such outstanding leadership will be equally important in achieving the goals of this plan.

#### **Private Research Universities in American Higher Education**

American higher education is widely admired throughout the world. Although the United States has no national university system, we have achieved a breadth of access to higher education for our citizens that is unequalled and a depth of accomplishment in advanced training and scholarship that is unrivalled. The balance of trade in intellectual capital and in providing intellectual services is decidedly in our favor. Our strength results from the tremendous diversity of our educational “system”—which is of course no system at all, but rather an educational *ecosystem* of over 3,000 separate institutions, some public and some private, some large and some small, some focussed exclusively on undergraduate education and some with broader aims in teaching and research.

While institutions of many types and levels can be effective in meeting their missions and serving their particular constituencies, only a small number of the more than 3,000 institutions of higher education are nationally and internationally preeminent by virtue of the breadth and depth of their capacities and the contributions to education and learning that result. There are institutions of this caliber among the great state universities, and some of our liberal arts colleges are truly distinguished. Among the great research universities, a very high proportion are private. Many of these same institutions are leaders in graduate and professional education, research, and health care.

Private research universities occupy a special place in the diverse world of American higher education because of their distinctive missions, organization, governance, and funding. They are deliberately intermediate in scope and scale between the small private colleges and the large public universities. As a group, they attract a disproportionate number of the best faculty, are highly selective in their admissions policies, create a residential educational experience that promotes interaction with the faculty and student learning outside the classroom, and provide much of the nation's leadership in research and scholarship. They are resource-intensive places, typically combining large endowments, strong philanthropic support, and external research

funding with high tuition. These resources are powerfully additive in supporting the teaching and research missions of these institutions and their commitment to national and international leadership.

Like the best small colleges, the premier private research universities provide low student:faculty ratios, small classes, and extensive residential programs with attractive social and cultural amenities. At the same time, they support their research missions through competitively paid, research-oriented faculty and the library, technology, and facilities infrastructure necessary for them to succeed. Professional schools in areas like business, law, and medicine add further to the range of opportunities these institutions provide. Out of this combination comes an education of extraordinary breadth and depth, as students learn from faculty members who themselves are actively engaged in creating new knowledge and solving real-world problems.

### **Duke's Mission, Ambition, and Responsibility**

Duke University is among these top echelon private research universities. We have substantially realized James B. Duke's remarkable vision of transforming a progressive regional liberal arts college into a national and international university. Thanks to the vision and patient labor of generations of trustees, administrators, faculty, students, and alumni, Duke has claimed "a place of real leadership in the educational world," as he envisioned. Our trajectory has been remarkable, and our momentum is strong. But our work is never done. Honest self-examination and understanding of the competitive advantages enjoyed by even more successful institutions show us the way. Moreover, like other successful private universities, Duke must continually adapt its priorities and commitments in the face of new environmental opportunities and challenges and the changing internal dynamics of the educational ecosystem.

This is not a matter necessarily of catching some institutions or surpassing others. We do not know with certainty which institutions will be "the best" 20 or 30 years from now, or how the best will even be defined. ***Our overriding goal therefore is to be among the small number of institutions that define what is the best in American higher education.*** Certainly Duke can learn from other institutions, but we must also set our own sights and help set the standards for others. This is what leadership means.

What are the practical implications of this overarching ambition? It means first of all focussing on fundamental purposes and then setting our own standards. We are the stewards of a sacred trust rooted in our strong historic ties to the Methodist church, recognized civilly in our tax-exempt status, and reinforced by the benefactions of generations of donors who have reposed confidence in us to exercise wise stewardship over the resources they have entrusted to the university. This sacred trust and attendant resources have but one inter-related, common purpose: to foster the intellectual and ethical development of individuals and to promote the good of society. We pursue the good, as the Indenture and our mission direct, through teaching, patient care, the preservation and discovery of knowledge, and other forms of service to our community.

Being a leader in these pursuits requires an unstinting devotion to excellence. The notion of excellence and its pursuit has become something of a cliché in recent years so it is worth pausing to consider what we mean by it. Like other fundamental values, excellence eludes simple definition; nonetheless, some effort at clarification is worthwhile. Excellence is first of all a quality of what we aim to create. To paraphrase Ambrose Bierce, excellence is the quality that distinguishes the imaginary state of perfection from the mediocrity we too often see around us. Although we can't always define or measure it precisely, thoughtful people recognize excellence in the various walks of human life, and that subjective recognition—justly deserved fame—is intrinsic to its elusive quality. Indeed, the most common way to recognize excellence is through peer review processes—juried competitions and selection committees for prestigious awards, for example. From another perspective, excellence is not a “thing” or an end-point but rather, as Aristotle was probably the first to say in his discussions of ethics, a habit—or discipline—of constantly pursuing the best. The pursuit of excellence is not a destination but the disciplined commitment to excel (to rise above others, to be eminent).

Duke's ambition must be to excel in its chosen endeavors, to pursue the elusive goal of perfection through constant improvements, to surpass others and gain distinction. This is our responsibility if Duke is to claim and sustain a “place of real leadership” in the educational world and to serve society as James B. Duke envisioned. This striving to be the best is what gives us the prospect of being among the best.

How do we know if we are hitting the mark in doing good and pursuing excellence? We need both internal standards and external feedback. While a substantial section of the strategic plan is devoted to assessment, it is worthwhile to reflect here on the fundamentals with regard to teaching and research. Consistent with our mission, we want to have a demonstrable impact on the good of society through our teaching, research, and direct service to the community. Our social impact in teaching is greatest if Duke educates leaders, men and women who will not only succeed professionally but who will be role models in their personal conduct, their civic contributions, and their commitment to lifelong learning. It follows that we want those whom we teach to leave Duke better equipped not only with specific knowledge and skills but also with a truer ethical compass, a deeper sense of social responsibility, and a more passionate engagement in the multi-faceted world around them. This is especially true of our responsibilities to—and expectations of—undergraduates, who spend four especially formative years among us, shaping their characters as well as their minds. As Duke graduates, all our students must share that sense of stewardship of our sacred trust that properly motivates trustees, administrators, and faculty.

We can only imperfectly measure our success in educating in this expansive way, but what we want to gauge is the long-term satisfaction of our alumni, both with their Duke education and with the lives they lead, and the contributions they make in their professional endeavors and the communities in which they live. Shorter term, we can—and do—learn from our currently enrolled students about their Duke experiences, what is working well and what needs improvement. While we can gauge success

anecdotally, and measure it periodically through survey research, there is also an important market test, and that is the demand for our programs expressed in our applicant pool and matriculation rates. The expected value of a Duke education is embodied in the choices of the thousands of students who apply for places in our programs each year. Indeed, this is one of most critical forms of external feedback we receive.

When it comes to research and scholarship, Duke serves society by preserving and extending the body of human knowledge, enriching the diverse perspectives that can be brought to bear on the fundamental character and practical problems of human life and society, and contributing to the stock of useful products and services available to society. How do we know if Duke is succeeding in this part of our mission? Again, there are no definitive, easy measures. Just as the individual impact of a Duke education is played out over decades, the work of research and scholarship is long-term and cumulative. Some impacts are immediately evident, but the lasting impact of ideas and discoveries is something only time can tell. But we know Duke is succeeding when the work of our faculty is published in prominent places, discussed in the national media, cited in the works of other scholars, taught in their courses, and honored by professional organizations and national awards. In professional fields, we want to inform the practice of doctors, lawyers, preachers, engineers, businessmen, and public policy makers well beyond the ranks of our own students. In the sciences and engineering, we want to earn the support of private foundations and government agencies, produce important discoveries and translate them into successful products and processes. Though harder to quantify than student demand, these are all real market indicators of our effectiveness.

But we can also look closer to home. The most immediate impact of our scholars and researchers is on their faculty colleagues and their students. Interesting faculty attract interesting faculty, and we can size up the vitality of our faculty individually and collectively by the degree to which they serve as magnets by virtue of their ability to stimulate the creativity and contributions of others. It is not just the quality of our faculty that matters but the quality of their interactions with each other and with their students.

This latter point provides an important reminder of the centrality of community in higher education. Our job as leaders is to create the conditions that allow teaching, learning, scholarship, and research to flourish. While each of those activities can take place under a wide range of circumstances, there is no question that they flourish most effectively in a community that shares a common purpose and values, a community that fosters creativity, intellectual risk taking, spirited debate, and social engagement. Essential to achieving those common purposes is a value system that respects and takes full advantage of the intellectual and cultural diversity of our community and that accords dignity and respect to all of the varied people and roles essential to the mission of Duke. Like excellence, community is an elusive ideal. It is both a goal and a discipline—and we must keep it constantly in view.

## **Competition and Differentiation: Duke's Distinctive Signature**

In our consideration of the broader context in which Duke functions, it is important to discuss the dynamics of our market within American higher education. The leading private research universities have much in common, offering similar degree programs and pursuing similar lines of research, yet the rivalry among them is often intense. Each institution is pursuing excellence—and the public recognition that comes with it—on its own terms, seeking to create the deepest, richest, and most diverse environment possible for teaching, learning, and research and for the preparation of new leaders for our society. The leading universities compete with each other for the human and financial capital they need to excel in their broadly overlapping missions.

Although this competition can be costly and sometimes takes on the character of an arms race, the independent pursuit of excellence by individual institutions is an important source of innovation. Because there are few if any trade secrets in higher education and many channels of information sharing, successful innovations are widely publicized and then diffused. This free flow of information and innovation is undoubtedly one of the great strengths of the American system of higher education, contributing to its ability over the last century and more to meet the challenges and seize the opportunities presented by changing environmental circumstances and new public demands. It also helps to explain the broad similarity of the leading institutions as well as the relative stability of the prestige hierarchy in American higher education. If Duke develops an innovative, effective program of teaching or research, other institutions with adequate resources can seek to imitate our success. Similarly, we are always on the lookout for what is working elsewhere.

Nevertheless, because no institution has the resources to escape defining choices, and each institution evolves independently, every private research university has its own distinctive signature reflecting its unique history, specific programmatic balances, and relationship to place and space. We need to understand what is truly distinctive about Duke's signature and what elements of that distinctiveness we want to preserve or sharpen over time. Having this or that program is not alone the answer because programs can be replicated and their leadership attracted away. Our signature is determined far more by distinctive programmatic balances, relationships, and values. James Engell, Professor of English and Comparative Literature at Harvard University, has expressed this idea most eloquently in a discussion of the *entelechy* (en-TEL-echy) of higher education:

*Entelechy* means the striving for perfection in a series of goals taken together as a whole. The word comes from Greek *enteles*, or complete or full, which in turn derives from *telos*, or goal. An *entelechy* demands we envision how to fulfill the potential of the whole by coordinating and giving proper relative weight to a set of varied goals and the goods they seek to achieve. For each institution, this

entails a particular inflection or emphasis.<sup>1</sup>

How do we describe the balances and inflections that form the signature of Duke? Several interrelated factors create this signature:

- We have an exceptionally strong tradition of academic freedom dating back to Trinity College; we recognize that this tradition of unfettered inquiry, free expression, and spirited debate is essential to the critical examination of the human condition and the discovery of new knowledge. Like other forms of freedom, its productive exercise requires mature judgment and respect for the rights of others.
- The distinctive combination of schools that constitute Duke and the relationships among them are unique. Each of our schools has substantial interactions with virtually all the others, and our faculty members have close colleagues and collaborators not only in their own disciplines but in many others as well. This is less true of our students but ought to be more so; the intergenerational University Scholars Program is a start.
- This sense of complementarity and habit of cooperation extends beyond our own campus to formal and informal partnerships with other universities and organizations in the Research Triangle, across the country and, increasingly, throughout the world. Duke has been and will continue to be a leader in collaboration.
- Our signature reflects a combination of place and scale and a relationship between campus and surrounding towns that is especially conducive to community. It is easier at Duke than at most other major private research universities to establish multifaceted relationships that span professional interests, family friendships, religious devotion, and recreational pursuits. In addition, we have abundant opportunities, individually and collectively, to help meet the many needs of the Durham community and to see our efforts make a tangible difference. We need to sustain and expand this sense of belonging to a community, and make it more intergenerational and inclusive; it is one of our defining assets.
- Duke is a community of deep engagement for students outside the classroom, in community service, the arts, political organizations, academic competitions, and athletics. Duke's men's and women's sports attract the interest and loyalty of people in all walks of university life, and in the wider community as well. Participation in high-level athletics competition while engaging in a challenging course of study is a defining characteristic of Duke for many students; and many more of us take pride in their efforts and accomplishments and share their triumphs and disappointments. Our widely shared interest in athletics is an important source of community; the academic and athletic performance of our student athletes and their personal conduct reflects our commitment to excellence, personal growth, and high standards for all our

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<sup>1</sup> James Engell, "The Idea of Organic Growth in Higher Education," paper presented to the Forum on the Future of Higher Education, The Aspen Institute, 1999, p. 1.

students.

- Duke has a culture of innovation and collaboration rooted in its long tradition of academic freedom and the ease of interaction in an academic community situated in a small town environment. Duke is especially open to innovation and supportive of entrepreneurial initiatives undertaken by our schools and members of our faculty, staff and student body. We need to make this sense of shared ownership and empowerment even more pervasive.
- We have a tradition that fosters moral and ethical reflection, responsible leadership, and spirited debate. This tradition permeates Duke in many ways: through the central presence of the Duke Chapel; the broad influence of the Divinity School; and the fresh energy of the Freeman Center. Our innovative Institute for the Care at the End of Life spans schools, disciplines, and faiths in addressing some of the most personal human needs and profound mysteries. The innovative work of the B. N. Duke, Hart Leadership, and Kenan Ethics programs touches many members of our community. Our robust faculty governance system and the active roles played by students, through DSG and GPSC and many other avenues, provide abundant opportunities for leadership, linking faculty and students with each other, campus administrators, and trustees.
- Duke is committed to the value of diversity in all its forms as part of the celebration of human life and a fundamental foundation for effective teaching, learning and inquiry. Though this commitment has never been perfectly realized, it has deep roots and requires constant nurturing. An especially important part of this commitment is our strong support for effective financial aid programs in each of our schools; these programs help ensure that our programs are accessible to talented students from many diverse backgrounds and that all our students benefit from participation in a diverse academic community.

Our quest for academic excellence is inextricably bound up with these signature qualities. Like any other great university, Duke depends on attracting outstanding faculty, students, and administrative leaders. But it is how their talents and energies work together that matters, and Duke is a particularly conducive place for working together, for interdisciplinary collaboration, for the transmission of values and experience through participation in an intergenerational community in which we learn from each other—and challenge each other to excel.

These relatively intangible qualities require careful cultivation, and that work goes on as a function of leadership at many levels, an essential backdrop to the development and execution of our academic plans. We recognize, of course, that none of these signature characteristics is fully formed or free of tensions and contradictions. Raising them to consciousness helps us understand these tensions, and the work that remains to be done to build a distinctive, inclusive community devoted to academic excellence, not for its own sake, but as part of a fabric of stewardship, citizenship, and reverence for the gifts that have been assembled here. This is the *entelechy* that makes

Duke a special place—a place like no other—to teach, learn, discover, create, and offer care.

### **Fundamental Threats to the Pre-eminence of Private Research Universities**

This mission-driven, values-driven view of our defining characteristics comes under periodic pressure, and the pressure is intense today. Over decades and centuries, however, universities have shown a remarkable capacity to adapt and change; they may change slowly, after many committee meetings, but they do change. “New inventions, fresh discoveries, alterations in the markets of the world throw accustomed methods and the men who are accustomed to them out of date and use without pause or pity,” wrote Woodrow Wilson, then Princeton’s president in 1909.<sup>2</sup> But the institutions about which he worried are still with us, recognizable though also clearly different. Indeed this combination of change and constancy, innovation and consolidation, is what makes it possible to think of universities as *institutions* and not just organizations or enterprises. Private universities like Duke are here for the long run and must chart their courses accordingly.

Yet this is a moment of paradox. On the one hand, the demand for high-quality higher education is at an all time high and support for our research mission is equally robust. Despite the substantial costs, would-be students are lined up by the thousands to attend the leading institutions, and most are turned away. The returns to a college degree are also at an all time high; the knowledge economy is for real, and solid college preparation and advanced degrees are rightly seen as essential to success. Moreover, it is widely recognized that the breadth of education acquired through a liberal arts education, with its emphasis on lifetime learning and life skills, is the best preparation for a complex, rapidly changing, interdependent world. Yet this is also a moment of great anxiety for higher education. We have weathered a decade of criticism about rising costs and “political correctness” that has not wholly subsided, and there are now new threats on the horizon.

The threat most often cited today is digital technology and, more particularly, the emergence of vigorous, entrepreneurial for-profit education providers. A 1999 study by Merrill Lynch & Co. outlined the opportunities for private investment in for-profit higher education,<sup>3</sup> and the sums invested are rapidly increasing. The question is not whether for-profit distance education will become a factor but at what rate and with what implications for the leading private research universities. The issue for Duke and similar institutions is whether for-profit on-line education will unleash new forms of competition that will erode our core markets and thus force a fundamental restructuring of the kind of education that has been the hallmark of private research universities.

On-line education by for-profit providers could fundamentally change the dynamics of competition and educational delivery. In the “old economy,” the leading

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<sup>2</sup> Quoted in Engell, p. 1.

<sup>3</sup> M. Moe, K. Bailey, and R. Lau, “The Book of Knowledge,” Merrill Lynch & Co., 1999.

institutions competed for the best students and the best faculty, but they did not compete for market share—no one wanted substantially more students, who would overwhelm finite campus resources and dilute student quality. But in the model of the “new economy,” education is infinitely scalable, and the new for-profits will want market share above all. This makes all the difference. Standardized curricula consisting of “plug and play” modules prepared by the leading content authorities and supported by wizards of the new on-line, multimedia technologies and cognitive learning specialists will obviate the need to prepare local lectures on American politics or English literature or organic chemistry. At the same time, the cost per unit of instruction delivered can be driven dramatically downward as economies of scale are realized, potentially extending the reach of high quality education but threatening the purchase of old-fashioned, labor intensive, high-cost providers. Students will not only benefit from lower costs and the wider availability of “name brand” education, they will be free to choose the time and place of study to suit their own convenience. Students will have “live” interactions with their professors or instructional guides through two-way video or at their convenience through electronic mail and course web postings. On-line libraries from around the world will be at their fingertips. Students will meet and greet each other digitally, discussing course content, collaborating on projects, sharing cultural and political interests, developing friendships and romances, and perhaps even competing in their favorite “dream team” on-line sports. The beautiful grounds and expensive bricks and mortar foundations of today’s leading institutions may become a liability rather than an asset.

This stylized vision of market forces and new technology is powerfully exhilarating to some, deeply troubling to others. What does it mean for Duke and other distinguished private research universities? We are, after all, the “old-fashioned, labor-intensive, high-cost providers” in the paragraph above. In one very important sense, the scenario outlined above is not really new. Private research universities have always faced competition from lower cost institutions. We have deliberately chosen a small market niche, providing high cost/high value education to a small number of the best qualified students, all of whom would have had a wide array of less costly alternatives open to them. So competition itself is not new. Demand for selective private higher education under these circumstances has always exceeded supply, despite significant cost differences. Our market power can only be explained on the assumption that students and parents are finding an experience of great value in the education we offer. Notwithstanding bursts of public concern and criticism about the quality of the education Duke and similar institutions offer, we have stood up to this fundamental market test very well.

The real question for the future is whether the structure of demand is likely to change. Will the students and parents who currently chose institutions like Duke prefer a digital university without walls in the future? This alternative will be cheaper (as are other current alternatives), but will it also be more appealing, or at least sufficiently appealing to change current preferences? These are not questions that we can answer with certainty. But to face them squarely, we need a clear-eyed understanding of our “customers” needs and expectations and a commitment to meeting them through the “value proposition” we offer them.

Survey research suggests two things: students are seeking academic quality and a sense of community that will reach beyond the years of study on campus. Clearly, there is a mix of practical and idealistic motives in seeking these characteristics, but many students are finding them in private research universities. We have been meeting their needs—never perfectly, but in many substantial ways. The “value proposition” of the private research university has rested on three fundamental principles: the complementary relationship of teaching and research scholarship in producing a distinctive form of education that at its best involves students directly in the creation of new knowledge; the value of personalized education that is as much about leadership and character formation as it is about skills and knowledge transfer; and the overarching importance of participating in a learning community, with a wide range of intergenerational interactions and opportunities for leadership and participation in athletics, cultural events, and social service.

Our conviction is that the best way to succeed under changing market conditions will be to intensify these distinctive characteristics of private research universities, and Duke’s signature among them. At the same time, we must be fully accountable to our many constituencies in demonstrating as effectively as possible that the education and community we sustain creates superior value, widely accessible, for the students who experience it directly and for the larger society. This vision of conserving a legacy rooted in deeply held values and intensifying our signature is fully compatible with, but must constantly shape, our commitment to innovative leadership through bold initiatives in teaching and research. These initiatives will not only deepen our commitment to traditional modes of inquiry and discussion, they will also harness new technologies to our carefully defined purposes and allow us to reach new markets of students, particularly in our professional school programs, beyond our traditional reach.

The academic plan that follows gives bold expression to our commitment to stewardship, leadership, excellence, community, and values—to our distinctive *entelechy*. Duke University, like the other great private research universities, was created and has been sustained by men and women for whom these simple virtues have real meaning. If we cannot sustain these virtues, we are unworthy of our legacy and deserve to be judged by ordinary, commercial, and utilitarian logic. Cyber-U will not be far behind.

## PART ONE

### THE PLANNING ENVIRONMENT

Duke is recognized nationally and, increasingly, internationally as among the best private universities in the nation. Over the next twenty years, we aspire to become fully as good as any of the leading private research universities in the country, with comparable breadth and depth, and deserved reputation for excellence in teaching, research, and wide-ranging contributions to society. To achieve this ambition we will need vigorous, visionary leadership; an effective, responsive planning process; growing resources; and careful management and execution.

We recognize fully that perfect foresight is not possible and that our ambitious plans must be carefully monitored, with mid-course corrections as necessary to seize new opportunities or to meet unanticipated challenges. As will be clear in subsequent sections of this document, assessment is thoroughly integrated into our plans (see especially Part VII) and the plan itself provides a framework of principles and priorities for making the inevitable mid-course adjustments.

#### **A. The Mandate for Planning**

Effective planning is critical to our success; our planning must be both comprehensive—looking at the university as a whole—and particular, focusing on the needs and possibilities of our individual academic programs. Several of our individual schools have already attained levels of excellence comparable with the best of their peers. They are national and international leaders. Others are close to attaining such standing. All of our schools have used this planning process to plot a path toward greater achievement in teaching and research. The excellence of our top schools must be protected, a task requiring not complacency but vigilance and strategic innovation. Those that are close need to identify how to use their current base to build points of true national and international achievement, peaks of strength that can take the greatest advantage of developments within their fields and their own and Duke's strategic assets. Those farther away need to chart the steps to major gains in excellence, recognizing that their advance will come in stages that must be attuned to ambitious but realistic interim goals and strategies that can take maximum advantage of opportunities in their fields.

To improve at the rapid pace we intend, and to reach the level of excellence to which we aspire, will require that Duke invest wisely and strategically. We need to decide where and how to invest in excellence in areas in which we have great potential, even as we retain our leadership in areas in which we are already strong. And, we will have to do so by bringing as many of our resources as possible to bear on our strategic priorities while assuring that our faculty and programmatic goals are matched by modern facilities, without which they cannot be attained. Sixteen years ago, in his Presidential Address to the Faculty, Terry Sanford spoke of President Crowell's plan for Trinity and the move to Durham, stating that "there is nothing wrong with being outrageously

ambitious for your institution.” Duke University’s history is the unfolding of these “outrageous ambitions,” and Sanford’s apt characterization of this institution must be no less true today than it was when he first made this observation.

## **B. Assessment of the External and Internal Environments in Which We Plan**

Duke’s year 2000 institution-wide planning effort has been undertaken in the context of the major external and internal environmental trends that promise to shape our endeavors for decades to come. Our process has identified the following as critical influences that, when combined with our core commitments, will shape our plan for Duke in the years ahead:

- Major intellectual trends across the disciplines;
- New and rapidly changing information technologies;
- Emerging new markets and products;
- The increasing importance of diversity, including the forging of international partnerships;
- Regional responsibilities and underpinnings;
- Infrastructure: facilities for science and engineering and interdisciplinary collaboration;
- Financial resources.

## **Major Intellectual Trends Across the Disciplines**

### Interdisciplinarity

While the modern research university was forged from an alliance of disciplines, with knowledge largely fostered within traditional departmental or school structures, recent decades have seen an accelerated integration of knowledge across the sciences, social sciences, and humanities, in fields ranging from the biosciences to cultural studies. The mode of research that permits this integration of knowledge can be characterized, to a substantial degree, as multidisciplinary and interdisciplinary. Important new understandings of the nature of research reveal that interdisciplinarity and integration were key factors in the major discoveries in the biomedical sciences in the twentieth century—and institutional nourishment of both factors was the constant. Because of its relative youth, comparatively smaller and more integrated campus, and less deeply entrenched departmental cultures, Duke has particular opportunities to build on its culture of fostering interdisciplinary collaboration, while retaining the positive qualities of disciplinary teaching, training, and research.

What should be clear from all of our multidisciplinary and interdisciplinary planning is that the connections between areas of knowledge are growing increasingly complex. Policy and ethical issues are as key to discussions of genomics and global change as is the science that underpins them, while information technology initiatives require us to consider equity, access, and even aesthetics. Given that technology is changing faster than our imaginations can keep up, it is not surprising that many of the traditional departments and disciplines around which universities were organized a hundred years ago are being tested in 2000. Duke's planning process is about ideas and creativity, and we consciously have not been bound by the traditional structures that limit many of our peer institutions.

Our task is to facilitate interdisciplinary research and teaching through incentives, encouragement, rewards, and the removal of institutional, bureaucratic, and intellectual barriers. To achieve these goals, we need to find ways to ensure that scholars who pursue exciting boundary-crossing intellectual work are not only free from penalty but also receive recognition in Duke's tenure and promotion process.

### Basic Research: From Timeless to the Timely, from Future-Oriented to Use-Inspired

The research university is one of the few places in society where knowledge is prized for its own value.

By supporting their faculties' individual and collective curiosity, universities have produced new knowledge that has driven revolutionary intellectual developments. We need only look at the "information revolution" and the pervasiveness of electronic information and delivery to appreciate the power of curiosity-driven research. Our planning process has once again convinced us of the importance of reaffirming our commitment to support research and scholarship that is driven by the intellectual

curiosity of our faculty. We do so not just because we believe this benefits the individual investigator, but because we are convinced that the results of such inquiry can lead—as it so often has led in the past—to fundamental advances of our society.

At the same time, we realize that much important research conducted by universities today is use-inspired. This term, used in a 1998 report by the late Charles Putman, pointed to a proposal by MIT President Charles Vest for a new paradigm for the relationship between pure and applied research: if physicist Niels Bohr and inventor Thomas Edison may be said to represent opposite ends of the spectrum of the search for knowledge versus the search for practical applications, then a scientist like Louis Pasteur can be seen as representing basic research that is “use-inspired.” This paradigm is defined by greater engagement of the disciplines and university teaching and research with problems defined outside their borders, by societal needs, and by increased collaboration among disciplines and partnerships with other institutions, inside and outside the academy, in the public, non-profit, and private sectors.<sup>1</sup> At the same time, research in the university will continue to be defined and distinguished from that in industry by its focus on fundamental principles, its longer time horizon, and its broader view; thus it continues to be characterized by the crucial word “basic.”

At Duke, this paradigm is most evident in scientific fields like genomics, global change, and biological materials. In the social sciences, the re-balancing of disciplinary and use-inspired research has advanced less far, with the notable exception of Public Policy. In the humanities, the societal pressure for “relevance” takes a somewhat different form in the increasing attention to the critical analysis of contemporary social and cultural phenomena. Interactions between scholars in the humanities and in the interpretive social sciences provide evidence of the impact of the broader contemporary focus on the importance of the University’s engagement with pressing social issues.

Central to our planning process is the assumption that we must facilitate an environment conducive to the conduct of use-inspired basic research, building on the considerable internal resources already in place to foster such development. In this regard, the configuration of our departments and schools works for us, and the projected growth of the Pratt School of Engineering is particularly timely. Ultimately, the research enterprise begins with the faculty, and thus it will be essential to create an environment that identifies, promotes, and rewards success in use-inspired basic research. At the same time, we will need to retain our own traditional strengths in the basic disciplines, without which long-term success in use-inspired research is not likely to be sustained. And, we will need to ensure that our commitment to use-inspired inquiry and collaborations with external partners does not compromise the academic freedom that has been a hallmark of Duke.

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<sup>1</sup> See Donald E. Stokes, *Pasteur’s Quadrant: Basic Science and Technological Innovation* (Washington, D.C.: Brookings Institution Press, 1997).

## Integration of Teaching and Research

Teaching and research often have been defined as competing poles of faculty responsibility, with a concomitant urgency to strike the proper balance between them. Over time we have come to recognize the need to reconceptualize how we think about these core activities, to acknowledge more fully their multifaceted and reinforcing nature and the intersections between them.

Duke's commitment to excellent undergraduate teaching has been a core value since the University's founding. As the University has grown, this commitment to excellent teaching has extended to its graduate and professional students. We believe that at a leading university, the faculty's obligation to train graduate students as the next generation of college teachers and knowledge producers requires that we provide excellent instruction; moreover, graduate students frequently are important partners in the conduct of faculty research.

By acquiring the skills that are important to productive scholarship and information management, our students will be better prepared to meet the challenges of work after they leave Duke. The implied learning contract between Duke and its undergraduates assumes, therefore, that our faculty not only bring the passion and excitement of their own research into the classroom, but that they also should include research as an integral part of undergraduate education. By so doing, they enrich the intellectual work of our students and strengthen their own teaching.

## Shifting Centers of Mass in the Sciences and Engineering

Many historians of science have observed that the fundamental issues addressed by physics and its cognate disciplines dominated the last half of the twentieth century, a result of the cold war following World War II and the corresponding federal investments to support the nation's defense objectives. The "atomic era" referred not just to atomic power and its potential destructive power; it included a science built around the ever-finer understanding of the micro-foundations of physical life and their implications for both profound philosophical and religious questions and some of the most practical questions of everyday life.

Not surprisingly, with the end of the cold war, the center of gravity in the sciences has begun to shift from the physical to the biological and biomedical sciences. The genomics revolution, the growing societal preoccupation with disease and rising expectations regarding cures, the increased concern with the ecology of our planet, the pressures created by demography on food supplies and systems for human sustenance—these forces have redirected substantial societal and academic attention to the life sciences. At the same time, these very concerns, and the science needed to address them, require vast resources and capability in fields of computational science and engineering. They also pose a host of ethical and policy challenges.

For a variety of reasons, Duke is particularly well suited to respond to these significant changes. The combination of strong departments in the biological sciences in several of our schools, and an excellent and dynamic (academically as well as clinically oriented) health system, provides us with a firm base on which to build future scientific leadership. If we are to achieve the leadership position to which we aspire, however, we need to muster substantially greater resources in support of our scientific enterprise and to assure balanced and targeted strengths in its component parts.

Nowhere is this more evident than in computational science. The impact of computing on research has been critically important in science, engineering, and medicine. The biomedical community is increasingly building on and demanding more from the power of computing, both to manage and analyze data and to model biological processes. Increasingly, researchers spend less time in their "wet labs" gathering data and more time on simulation and computation. The scale of these computations is enormous and the expertise to perform them can be created only by a careful marrying of skills across disciplines.

Engineering at Duke has traditionally been academic in nature, with less focus on industrial partnerships than engineering schools at many campuses, particularly the public universities. States have always appreciated the value of engineering, their appreciation colored by the industrial and agricultural focuses of their localities. But engineering schools at small, private universities have been less entrepreneurial and less focused on technology transfer than their public counterparts. The new focus on "use-inspired" research and new opportunities for industrial collaborations have helped define a new role for engineering as the transfer engine for the scientific intellectual property of the university. This is not to imply that engineering faculty are less involved in the process of creating new scientific advances, but rather that engineering plays an increasingly important role in the process of transferring basic scientific discoveries into products benefiting society. In fields like optics and communications, the Pratt School is well positioned for future leadership.

### New Connectivities in the Social Sciences

The social sciences have also seen significant changes and more are on the horizon. Globalization of the world economy and its effects on social and cultural systems—linked through the digital economy, the communications revolution, and cyberspace—have had a profound influence on every social sciences discipline. The best evidence of this shift is not in any one discipline, but rather in the emergence of "internationalization" and its move to the forefront of university agendas. With the end of the cold war, we see area studies as only the beginning point from which to explore an emerging paradigm shift into innovative and multidisciplinary and interdisciplinary approaches. Such approaches are more capable of coming to grips with the complicated and far-reaching phenomenon of globalization, addressing questions that are contextual, connective, and comparative, providing insights into the traditional, somewhat more bounded perspectives of area studies.

## Beyond the Cultural Wars in the Humanities

The 1980s and 1990s witnessed a heated international battle over the meaning of culture—what culture is (and is not) and how it should be taught in order to create future generations of educated citizens. The so-called “Culture Wars” debate often was hyperbolic and nasty; in retrospect, however, this debate was useful in bringing public attention to fundamental changes in society and ways in which—both intellectually and practically—they should be addressed. Indeed, some argue that the debate revealed the public’s passionate commitment to the arts, humanistic values, and a humanities-centered general education.

Duke has drawn strength from these Culture Wars by creating a forward-looking vision of the humanities, firmly rooted in such time-honored elements as foreign-language learning, historical research, theoretical and philosophical speculation, global understanding, cultural and social diversity, and aesthetic expression. These are key elements in the new Arts and Sciences undergraduate curriculum, Curriculum 2000, and they are also key to much of Duke’s specialized teaching and research in the humanities.

## **New and Rapidly Changing Information Technologies**

It is hard to deny the pace and centrality of the revolution in intellectual, academic, and social life unleashed by the emergence of digital technology and its permeation of so many aspects of our lives. Indeed, *everyone* knows that computer technology and its related developments—including the Internet in its various forms and uses—have transformed many of the areas in which universities have traditionally been leaders. It would be fair to say, however, that the private research universities have not been at the forefront in taking advantage of this technological revolution, especially in the classroom. In many ways universities have lagged, pressed neither by the need to teach large numbers of students nor by public mandates to expand their reach to student bodies in remote areas. Although The Fuqua School of Business has been a national leader in remotely delivered educational programs, and several schools at Duke have experimented—often with success—with remote delivery, this has not been a University-wide priority.

There are several technological areas that we need to target if Duke is to be a leader in the 21<sup>st</sup> century: the development of technologically related innovations in the fields in which we specialize; the use of technology in teaching and in research; the teaching of technology and its impact on society, both for those intending to specialize in technological fields and everyone else who will have to be prepared to use technology in their daily lives; the use of technology to better disperse and reap rewards from Duke’s intellectual products; the provision of technological infrastructure and training for these purposes; and the mustering of the necessary resources—human, financial, and temporal—to support these activities.

We must continually examine why we—and other universities like us—tend to lag in these areas and how we can overcome these lags when appropriate. Our task is to draw on and foster leading edge and visionary thinking while recognizing that in the *use* of technology we have neither the resources nor the organizational structure to be front-edge innovators across the board. Instead, Duke needs to define its strategy to allow the University to be a technological leader without tying our innovations too closely to particular technologies, when obsolescence occurs at a rapid pace and a serious misjudgment can be extremely costly.

## **Emerging New Markets and Products**

Technological advancements in tandem with our intellectual property and untapped markets create dynamic environments for sharing Duke’s intellectual expertise and for raising new resources to support our academic mission. At the same time, current markets for students, particularly in professional degree fields, may be vulnerable to penetration by others using new technologies in innovative ways to challenge our traditional predominance. We need to be highly attentive to both these opportunities and potential challenges.

Niche markets can be defined in many ways, including by profession, gender, and age. With career changes in one’s life becoming increasingly frequent, and with the accelerating pace of intellectual and academic change, continuing education is no longer to be considered *non-traditional*, even at so traditional (by academic standards) an institution as Duke. With increases in life spans, the years after retirement provide further opportunities for learning—learning for the sheer joy of it, divorced from practical dimensions. Duke possesses a ready-made loyal constituency for courses and programs in its ever-growing alumni body. And with a national emphasis on pipeline issues, Duke University’s ability to reach out to pre-college students to enrich their educational experience and to prepare them for further education (perhaps even at Duke) is significantly strengthened.

At the same time, we cannot be complacent about our traditional student markets. A higher education environmental scan would show that at the professional school level there are aggressive initiatives already underway that claim to offer a high quality remote education at prices significantly below those charged by Duke, and with far greater convenience. Particularly at the undergraduate level, Duke enjoys a number of characteristics that should make us relatively immune to invasion from the current low-cost providers. Indeed, these providers are generally approaching Duke and institutions like us to provide them with intellectual content that they can then market to students very different from our traditional student cohort. Nonetheless, we need continually to assess whether our programs for our traditional student constituencies are well designed to fill their educational needs and demands in a market environment that is rapidly changing with technology.

Each of our schools addresses these issues in its individual plan. Using distance learning technologies to reach new markets is an expensive and time-consuming proposition that is not without risk. Some units, like the Fuqua School, have made the investment; others have not yet been so inclined. The determination of where new niche markets lie, and how we might best reach them, requires careful thought on the part of each academic unit and careful monitoring by the University.

### **The Increasing Importance of Diversity, Including the Forging of International Partnerships**

The face of institutions of higher learning in the United States has dramatically changed over the last decades of the 20<sup>th</sup> century. At the elite private research universities with which we compete, there has been a major focus on the educational benefits created by bringing students of diverse backgrounds and experiences to enrich our campus communities. As an institution in a region with a history of racial segregation, we feel a special responsibility to address this issue. Duke is committed to the principle that our intellectual strength rests in large part on our diversity, in both our student and faculty bodies. True learning requires moving out of comfort zones and confronting the new, the different, the unfamiliar. A rich plurality of perspectives is a hallmark of the educational experience at an institution of Duke's quality and ambition. This principle is reflected in the cross-cultural competency requirement in the Arts and Sciences undergraduate Curriculum 2000.

Our senior surveys show a steady and encouraging increase in satisfaction with Duke on the part of our undergraduate ethnic minorities. Nonetheless, these results still lag behind those of our white students and minorities at many peer institutions. How to move beyond issues of access to those of community remains a serious challenge, one that must be tackled on several fronts simultaneously: by faculty, students, and administrators alike, in our undergraduate colleges and in our graduate/professional schools.

Diversity is not an end unto itself, but a means to reach an end. Then, too, it is more than a function of different races; in its broadest interpretation it is a mosaic of many different pieces. The education of future generations of leaders requires that they be equipped to understand different cultures—domestic as well as international. Internationalization is an important intellectual trend in itself and has been a growing priority for Duke for several years. Thus, we acknowledge our responsibility to make internationalization an integrated part of undergraduate teaching, graduate and professional training, and faculty hiring. One of the most significant trends in internationalization involves the formation of strategic partnerships, positioned within targeted countries in such a way as to provide mutual reinforcement of common interests for faculty and students as well as to build on or reinforce common strengths. Duke University, like other institutions, is seeking to develop alliances with a few major international universities, based on shared research and curricular concerns that are

directly related to university priorities. It will continue to give the development of these alliances high priority.

### **Regional Responsibilities and Underpinnings**

After a period in which it was difficult to bring ideas together with capital, the Research Triangle is now recognized as an area positioned for explosive growth. Life sciences, electronics, pharmaceuticals, and clinically related innovations are likely to be particularly important. In addition, the presence of the EPA and related activities provides linkages for environmentally oriented activities. Finally, our neighbor public research universities continue to be a major potential asset in the sciences, social sciences, and area studies. As this scenario suggests, there is substantial possibility for strengthened University ties and mutual benefit with private sector, public sector, and public university collaborators. We must move from a mode of competitiveness to one of increasing cooperation and collaboration. The regional economy and its development should be a major asset for Duke in its strategic planning.

We have begun to link our research efforts with those of the private sector and neighboring public universities in ways that should substantially enhance our quality in the next decade. The Pratt School of Engineering is in the process of significantly enhancing its outreach and developing internal programs to promote “translational” science. Similar efforts are underway in the School of Medicine. Initiatives in genomics and bioinformatics have established initial faculty linkages with North Carolina State University, built on significant complementarities of interest, research approaches, and the types of data to which different scholars can gain access. The new John Hope Franklin Institute for Interdisciplinary Studies, a humanities research unit that belongs to the consortium of programs designated as the John Hope Franklin Center for Interdisciplinary and International Studies, is located in the renovated Hanes Annex. The Center is working to create collaborations, faculty and student exchanges, and other joint ventures with the University of North Carolina’s Humanities Institute, North Carolina State University, North Carolina Central University, and the National Humanities Center (in RTP), as well as with many local community organizations. And the Fuqua School has highlighted “entrepreneurship” as a major area for teaching and research development, one that is expected to be enriched by connections with start-up firms linking scholars and private venture capital. In addition to strengthening the quality of the undergraduate experience students will receive, the recently established Robertson Scholars Program, which is premised on forming an alliance between Duke and UNC-Chapel Hill undergraduates, will help facilitate faculty exchanges between the two campuses because of the transportation infrastructure that it will build and the habits of collaboration that it will foster. With the addition of advances in technology that make distance less relevant, we have an unprecedented opportunity for building alliances and collaborations with UNC-Chapel Hill and other regional institutions.

## **Infrastructure: Facilities for Science and Engineering and Interdisciplinary Collaboration**

As Duke plans to deepen its contribution in science and engineering teaching and research and to strengthen its tradition of interdisciplinary inquiry, developing adequate state of the art facilities will be a major challenge. There is a building boom on leading campuses around the country, and Duke will need to bring new and renovated facilities on line to remain competitive and to relieve the current pent-up demand for additional space in many programs. The quality of facilities for teaching and research is critical to the recruitment of the best faculty, who, in turn, determine the quality of our undergraduate, graduate, and professional students. Major initiatives identified in this plan will require substantial renovation and new construction to achieve their programmatic goals.

In May 2000, the Trustees approved the Duke University Campus Master Plan. We are now moving to the next phase of that plan by identifying carefully the priority academic needs of the university. In assessing the critical space needs on campus, we have developed a comprehensive management perspective that carefully emphasizes incentives, standards, and flexibility. We are confident that our planning process and this new management culture, emphasizing more active and effective management of this important resource, will support the suppleness necessary for adapting quickly to emerging intellectual trends.

## **Financial Resources**

The financial outlook for supporting priorities in Duke's strategic plan is currently quite positive, despite the recent market downturn and signs of a slowing economy. Fluctuations in national economic conditions may affect the pace at which we can move, but our overall financial structure is strong and the outlook good. The long-term outlook is good for each of the four major revenue streams that support our academic programs: tuition, where continued restrained growth is necessary; sponsored research, where federal and corporate support is increasing; philanthropy, where our growing potential is evident in the tremendous success of The Campaign for Duke; and endowment and investment income, where the combination of the strong market performance in recent years, new gifts, and DUMAC's savvy investment strategy holds great promise for long-term growth. In addition, the development of new mechanisms for funding central initiatives, which were instituted at the time of President Keohane's arrival and furthered in recent years, are bearing considerable fruit. The University also has considerable unutilized debt capacity that is available for investment in major projects requiring capital expenditures. Together, these resources—both in the schools and at the center—should enable us to support the major initiatives we identify as priorities in our planning process. We are keeping a careful eye on the health care financial environment, which is continuing to evolve at the national and local levels, to ensure adequate funding for medical education and research.

The Board of Trustees and the central administration have also recognized the importance of managing ongoing resources wisely and actively. This management must include redirection of resources from less successful or less promising academic activities to more promising new initiatives or successful current programs, as well as periodic examination of the value of significant university academic and administrative programs. The provost's office has reviewed several major programmatic areas thought to be of potential significant savings but has concluded that, with one possible exception still under examination, each of these programs adds substantial value to our academic mission. We have strengthened processes to assure active management of our resources, particularly with respect to faculty lines. In addition, over the past several years we have been ratcheting down administrative growth and identifying operational efficiencies. We will continue to constrain our academic and administrative support costs and to seek savings that could be redirected to support important academic or intellectual priorities.

### **C. Conclusion**

In the preceding pages we have discussed the significant intellectual trends that will define the contours of the most vital scholarship, teaching, and learning, and the intellectual contributions that universities will make to society. We have considered advances in information technology and their impact on and importance to the academy, including their influence on how we conduct research, what and how we teach and learn, and to whom we communicate knowledge. We also have addressed issues concerning the shape of our own communities, including the multiple facets of its diversity. And we have highlighted and examined our role in our own city and region, and potential partners within it, both as a resource from which we can draw strength and as a community that we have a special responsibility to nurture. Finally, we have assessed our own financial and capital resources and limitations, including the crucial need for renovated and new facilities to support our academic and intellectual ambitions. These are the most important factors our plans must address if we are to achieve our ambitions and help define what it means in the new century to be a leader in American higher education. In Part Two, we lay out the principles that inform our planning and nine major goals for Duke University in the next decade.

## **PART TWO**

### **PRINCIPLES AND GOALS OF THE ACADEMIC PLAN**

Our academic plan is rooted in our assessment of who we are and what we want to be. We aspire to attain the broad range of excellence that characterizes those other institutions that attract a disproportionate share of the most outstanding faculty and students and that are regularly ranked above us. Ours is not a niche university. Among our most important comparative advantages are our ability to build excellent multidisciplinary and interdisciplinary programs, both within and across schools, and our ability to move somewhat more quickly and flexibly than many of our competitors, as demonstrated by our innovations in combining place and cyberspace. Our physical layout, especially the close proximity of the medical school and our professional schools, promotes interactions that are much more difficult at other universities. Our youth is also an advantage, for we are less tied to traditional modes of operation and more able to construct broad new innovative programs. Our culture generally supports programmatic cooperation and coordination as illustrated by the degree to which the current strategic plans of our constituent schools have developed along cooperative and complementary, rather than competitive, lines.

One clear outcome of our self-assessment is that in order to move to the next stage of excellence, we generally must build greater depth in selected areas before we can successfully broaden. Our facilities are badly out of date in a number of areas; to support our current faculty and recruit the most attractive new faculty, we must have quality space to support their teaching and research. Our facilities needs are most significant in the sciences and engineering and in support of information technology. A broad theme of our plan, therefore, is “deepening”—the intensification of support, including facilities and infrastructure, for the research and teaching of existing faculty, and expansion only in targeted areas where we suffer particular vulnerabilities or need to deepen faculty strength in order to fulfill research and teaching priorities.

Our greatest challenges are these:

- Rapidly changing funding environments;
- Implementing innovative approaches to education and research made possible by information technology;
- The need to train our students at all levels for leadership in a world characterized by diversity and globalization;
- Alleviating the potential tension between excellence in teaching and excellence in research.

With these in mind, we begin our academic plan by stating the principles that will organize and coordinate our actions over the next five to ten years. These principles derive from our internal and external assessments; that is, they have emerged in bold relief from the planning process itself. While these principles may seem obvious, they

actually entail constraints on the choices we have made in strategic planning and on the choices we will make in the future.

### **A. Principles**

1. Investment in constant improvement of the faculty is the route to excellence in all that the University does.
2. We should concentrate new faculty in the most dynamic intellectual areas where Duke can achieve excellence and make a difference, and deepen our resources in areas of strategic priority.
3. The educational experience at a research university rests on the scholarship of the faculty.
4. Integration of knowledge across boundaries to address fundamental problems of knowledge, society, and values is a critical component of the successful university in the 21<sup>st</sup> century.
5. A community built around diversity in all its dimensions—ethnic, international and cultural—is critical to securing the greatest intellectual talent and hence to the quality and success of the contemporary university.
6. Information Technology is an integral and indispensable component of education and research in the 21<sup>st</sup> century.
7. The quality of the student experience is an integral part of achieving institutional excellence and mission.
8. Extending Duke’s global reach and influence is crucial to our becoming a pre-eminent international university.
9. In certain strategic areas, it makes more sense to compete as a region than as an individual institution.

With these principles in mind, we first list and then detail our major goals for the next five years and beyond as well as the critical actions necessary to implement them. Each section suggests a set of benchmarks for judging our progress in meeting our goals, although we will reserve the discussion of how we will measure the overall success of the plan until Part Seven (Implementation).

## **B. Goals for Duke University**

1. Build an excellent faculty in every school.
2. Significantly strengthen science and engineering.
3. Be among the best universities at integrating teaching, learning, and research.
4. Promote major multidisciplinary and interdisciplinary programs.
5. Promote diversity in all aspects of university life.
6. Intensify the use of information technology.
7. Nurture the personal and intellectual growth of students by building community in social, civic, and academic realms.
8. Extend our global reach and influence.
9. Take a leadership role in building partnerships and collaborations in the Research Triangle, the state and beyond.

Our strategic plan for bringing excellence to all aspects of Duke University is framed within these goals and in the initiatives that we plan to undertake in support of them. Our intention is to be clear and concise about the issues each goal raises, the actions we must take, and the judgments we must make as we move forward. We will be bold in stating our intentions in each case, but we reserve the right to be flexible in our implementation so that a grander vision of excellence is attained.

## **Goal 1: Build an Excellent Faculty in Every School**

Principle 1: *Investment in constant improvement of the faculty is the route to excellence in all that the University does.* This principle is the cornerstone of our strategic planning effort. It dictates that we strategically invest resources to build strength in our faculty in every school, generally in targeted areas and, in some cases, more broadly. The specific plans for each school's development are essential appendices to this University plan, as they lay out in detail how and where that strength will be built.

Hiring is a keystone to improvement of the faculty. We create new faculty lines when there is a good academic reason and when we can afford it, but strategic use of positions created by regular turnover in the faculty is our greatest opportunity. We must, therefore, be willing to hire precisely in those areas of most dynamic intellectual development and not simply replace faculty just to continue a presence in a particular area. Making such choices requires institutional will and can be accomplished only with strong, consistent, and effective leadership. Generating the vision that guides that leadership and builds support for the choices made is the fundamental purpose of our strategic planning.

Our planning process has, however, identified that growth in the faculty of some schools is critical to maintaining and improving excellence and to attaining Duke's broader intellectual priorities. Specifically, we expect significant growth in three schools: Fuqua, Pratt, and, to a lesser extent, Law.

There is a pressing need for expansion of the faculty in the Fuqua School of Business. The successful leadership of the school in the international and distance learning markets drives this need as does the increasing demand for business education, especially among corporations. It is also a reflection of the Fuqua School's "thinness," and hence vulnerability, in existing and proposed areas of greatest research and teaching strength. Because Fuqua's trajectory of improvement is so steep, it is particularly subject to raiding of its faculty by schools ranked above it and must also compete intensely with these schools for the most promising or established new faculty. Fuqua's rise into the top five of the nation's elite business schools is precarious, due at least in part to its size.

There is also a need, as well as an opportunity, for expansion in the size of the faculty and student body of the Pratt School of Engineering. The role of engineering in translating scientific discoveries into innovations and products is critical, and this role calls for marked growth. Pratt is also currently our weakest school as measured by the national standing of its graduate programs. Without strength in engineering research, linked to excellent teaching and training on the graduate, professional, and undergraduate levels, Pratt cannot fulfill its role in the University and in society. A substantial improvement of the school cannot occur without significant increases in new faculty. At the same time, the dynamic emergence of new fields in engineering—including photonics, soft-wet materials, new aspects of bioengineering, and others—creates the opportunity for the Pratt School to leapfrog into national prominence despite its

weaknesses in more traditional engineering fields. We now have the basic resources to make such sustained enhancements to the school.

Finally, we expect modest growth in the faculty of the School of Law, thanks to disinvestments, reallocations, and support for accelerated appointments from the central administration. As with Fuqua, the size of our law school significantly limits its ability to compete in the current market. Law is a school with a high quality and highly stable faculty. Developing “peaks of strength” in areas such as intellectual property, as proposed in the Law School Strategic Plan, requires modest growth in its faculty.

But Duke will not improve its faculty solely by hiring new faculty. Duke’s emergence as an institution of national and international stature has been based on the contributions of its current faculty. We must retain our best faculty and support the efforts of every faculty member to become the best scholar/teacher possible. The latter objective, of course, is an important part of achieving the former. Support of faculty excellence can take many forms, but the primary one is an improved infrastructure to support teaching and research. We will provide new spaces and renovate others, especially in the sciences and engineering, where the need is greatest. We will provide the necessary support personnel with the expertise to assist faculty efforts, especially in the incorporation of information technology into teaching and research. And we will work to add and keep up to date the equipment and instrumentation necessary to support and strengthen our programs. This deepening of support for our current faculty may come at the expense of adding new faculty slots, but is necessary to allow our current faculty to attain the excellence of which they are capable.

Central to our strategy is a commitment to the identification and retention of those faculty members who are intellectual leaders in their disciplines. One element of our overall strategy is the program of Dean’s Leaves in Arts and Sciences; with this mechanism the dean can reward the most innovative faculty with extra time to develop new areas of research beyond that normally provided by sabbaticals. Another approach is the Research Fellowship Program proposed by the Fuqua School. We will continue to focus resources on our best faculty to reduce the likelihood that they will leave for other institutions and to help assure that they serve as magnets to attract and retain younger faculty of similar quality. Additionally, the Humanities Seminars at the John Hope Franklin Institute for Interdisciplinary Studies will provide faculty with exciting opportunities to develop new programs and interact with new colleagues.

We will also provide new mechanisms for supporting team teaching and course development. To support a broad learning experience for our students, we must choose which programs to develop selectively, but we will not invest halfway just to stay “in” certain areas. The latter strategy leads to lost investments as young faculty members choose to go elsewhere to find colleagues. Instead, we will continually strive to construct or deepen programs that are built on faculty strength within schools and departments, and on intellectual collaborations across the university.

Another important aspect of faculty improvement is proper recognition. The new environment of interdisciplinary research and teaching will require that the accomplishments of our faculty be properly recognized. We must become more aggressive in ensuring that Duke faculty members are recognized for their excellence in national competitions for research grants and on the rolls of national societies such as the National Academies. This requires supporting the faculty's efforts to gain such recognition and devising imaginative strategies for raising not only the faculty's strength, but also Duke's visibility in a number of areas.

Building faculty quality at all levels requires intensive review by peers. Critical to this review are the Appointments, Promotion, and Tenure (AP&T) process, the Distinguished Professors Committee, and the annual reviews undertaken by departmental chairs and deans in order to determine salary increases. The AP&T process begins the day an untenured faculty member arrives at Duke and continues until he or she reaches the rank of full professor. The high standards set and communicated by the Provost and the AP&T Committee need to be implemented at each level—the departments, their chairs and review committees, the deans, the AP&T Committee, and the Provost. Critical to attaining these standards is mentoring junior faculty by their more senior colleagues. It is also essential that the departments and/or deans and schools come to embody these standards and implement them “locally.”

With every decision to grant tenure, Duke will seek to improve the average quality of the faculty in the unit of the faculty member. Newly tenured faculty members must be substantially better, or provide strong evidence that they are likely to be better, than well over half of their already tenured departmental colleagues. The specific target level of quality will vary with the existing quality of the department's senior faculty, and needs also to be evaluated in the context of the department's existing and future expected contributions to the University's teaching and research missions. Hence, we must use the AP&T process as a critical instrument in our search for continual improvement.

In defining quality we consider three areas of performance: research, teaching, and service, in that order. Over the medium and long run, sustained vibrancy in scholarship, as measured by publication, review by peers, scholarly reputation and impact, is critical to continued effective teaching and training. Excellent scholarship, however, does not assure strong and effective teaching. Teaching must be independently evaluated and substantially factored into the assessment of a faculty member's quality and performance. Finally, before, and especially after, tenure has been attained, faculty members must consider themselves part of a number of scholarly communities—research group or unit, department, school, university, profession—and must understand that Duke expects them to contribute through service to the collective improvement of these units.

#### Actions:

In support of these goals we will undertake the following actions:

- 1. Hire and Retain Faculty in Areas of Strategic Importance, Recognizing the Critical Role of Reallocations of Faculty Positions to this Process.**
- 2. Develop the Space Necessary to Support Academic Priorities and Hiring/Retention Practices.**
- 3. Deepen the Resources that Support Faculty Scholarship and Teaching.**
- 4. Ensure Proper Recognition of Faculty Excellence.**

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size of individual units will be driven by a number of factors, not the least of which will be the successful development of these initiatives. Therefore, we will need continually to evaluate our hiring priorities as these programs move forward.

## **2. Develop the Space Necessary to Support Academic Priorities and Hiring/Retention Practices.**

The need for new and improved space and other infrastructure is manifest. We cannot expect to hire faculty at the level of quality we seek, and in the intellectual areas to which we are giving highest priorities, with our current facilities. While there are needs across the campus, we must choose carefully those improvements that will have the most immediate impact on the intellectual areas that have been identified as highest priority in this plan. Part Five (Facilities) discusses the campus's capital plan and how it relates to accomplishing our academic objectives.

## **3. Deepen the Resources that Support Faculty Scholarship and Teaching.**

### a. Instrumentation

In addition to constructing and renovating facilities, we must provide the instrumentation needed to enable our faculty to advance knowledge. This will be accomplished through a mixture of start-up funding, matching funds for external grant applications, and careful management of shared instrumentation facilities. We will also institute new space management principles that will allow us to reallocate research equipment and space when they are not being used productively.

### b. Support Personnel

Despite the ongoing imperative to control administrative costs, there is increased need for support personnel in a number of areas. This need is especially acute in the information technology area, where systems support and other expertise—though strong in a few areas (Fuqua, and to some extent, Law and Arts and Sciences, for instance)—are strikingly weak in others (Pratt, for example). Support for grant applications, at both the departmental level and that of the Office of Research Support, is another example. Finding the right mechanisms to support new centers and programs without taking away from departmental resources is also an ongoing challenge. While many of these needs must be addressed at the school level, the central administration will make efforts to coordinate and help fund personnel in areas where economies of scale are possible.

### c. Faculty Retooling

We will provide support for those faculty members who wish to retool their scholarship, especially in areas that are strategically important to Duke. By “retool” we mean refocus their research in new and innovative areas of intellectual inquiry. In

addition to normal sabbatical and Dean's Leaves in Arts and Sciences, the Smith Fund now supports internal sabbaticals for faculty interested in retooling, and the "New Beginnings" grant also supplies such development support for a period of three years. We will create a Provost's Initiative Fund, similar to the Smith Fund in Arts and Sciences, to increase the assistance to those faculty who wish to retool in areas of strategic importance. Appropriate mechanisms will be established to ensure that such support is used effectively within the mission of the home department and school.

#### d. Innovation in Teaching and Curriculum Development

Our infrastructure for innovation in teaching needs to match the ideals of collaborative, interdisciplinary scholarship that characterize our planning. Many faculty are excited about new mechanisms such as team teaching but are discouraged by administrative and bureaucratic obstacles. In this plan, Duke states unequivocally that innovation in teaching, especially in interdisciplinary environments, is a high priority if we are to provide improved, modern training for our students and support for the continued excellence and achievement of our faculty.

The new Arts and Sciences curriculum, Curriculum 2000, in its very conception invites new methods of instruction. Duke's innovative FOCUS program for first-year undergraduates provides an excellent model for team teaching that can be applied to other programs: by bringing diverse faculty together it successfully provides students with the opportunity to learn about and understand a subject from the perspective of several disciplines. We will strengthen the opportunity for faculty to participate in the FOCUS program to foster increased faculty interaction across departments.

In addition, we need to support innovative teaching programs for advanced undergraduates. The senior year capstone experience should be as rich as the experience that FOCUS offers to many of our freshmen. As we discuss further under Goal 3, the development of an intellectually intensive senior experience built around the student's major, with potential links to other departments and including a significant research component, should be an integral part of what we offer at least the best of our undergraduates. Such a program, however, requires a more intensive faculty effort—and hence diversion from other forms of teaching—and should be coordinated with the use of graduate and postdoctoral students. To undertake such a program in an extensive manner, therefore, will require new resources.

#### e. Information Technology

Proper support for faculty efforts to incorporate information technology into their research and teaching is an important part of both hiring and retention. Our plans for supporting these efforts are described under Goal 6.

#### **4. Ensure Proper Recognition and Rewards for Faculty Excellence.**

Faculty excellence needs to be properly recognized both inside and outside the university community. Outside Duke, recognition by National Academies and other professional societies is an important part of establishing our reputation as a top university. Up to now we have not promoted ourselves adequately in this arena, and we must intensify our efforts in this regard.

Within Duke we struggle, as do all universities, with the proper balance of reward and recognition for research and teaching. Balance questions are complicated by the fact that teaching responsibilities are not driven by institutional norms alone, but also by those of the disciplines. We have evolved a system in which lighter teaching responsibility is often shared by faculty only because of their disciplinary association, independent of whether or not they are still productive and competitive in research. We must end that system by providing the incentives and making the expectations clear. Faculty who are less productive in research can contribute in other ways, and if they do, they should receive proper recognition.

Another balance issue is that faculty can contribute to the university in diverse ways throughout their careers. It is natural, for example, that some senior faculty members will spend less of their time on research and more on teaching, training, and service. We must give proper support and recognition to all these efforts.

#### **5. Expand Our Efforts to Ensure Graduate Programs of High Quality.**

The best faculty require high quality graduate students. Graduate students play important roles in both the research and teaching activities of every department. Initially graduate students work as assistants, but as they progress in their intellectual development they become junior colleagues. The importance of providing a quality graduate program is not only central to our commitment to train future scholars and creative leaders, but is fundamental to the hiring and retention of the best faculty. To achieve this goal, we will continue the policy of allocating funds for graduate students based on the quality of the programs in which they work as well as the opportunities for their job placement. As the planning document of the Graduate School makes clear, resources are available to attract the best quality students to Duke and to dedicate new graduate students to interdisciplinary programs in areas of strategic priority.

#### **6. Review the Appointments, Promotion, and Tenure Process and Its Role in Achieving Our Qualitative Goals.**

The Provost and the Executive Committee of the Academic Council have begun a thorough review of the AP&T process during the 2000-2001 academic year. As part of

this process, we will develop effective methods of encouraging departments to recognize and reward first-rate intellectual work outside the narrow confines of a discipline. We will also establish new standards for measuring the quality of interdisciplinary work.

### Assessment for Goal 1

Mechanisms for assessing and benchmarking progress towards all nine goals are laid out together in Part Seven (Implementation) of this plan. To monitor our progress towards goal 1, we will:

- Continue to regularly assess the quality of departments through outside evaluations. Additionally, we will rely to a lesser degree on national rankings, especially those of the National Research Council (NRC). Unfortunately, the next NRC evaluation will be too early for the effects of this plan to be noted.
- Judge the impact of the strategic initiatives described in Part Three on the quality of the faculty. For each large initiative, we will establish an advisory committee consisting of internal faculty and, when appropriate, external faculty. That committee will have the responsibility, joint with the administration, of developing appropriate mechanisms for benchmarking and assessing the initiative.
- Monitor the number of faculty who receive national awards.
- Monitor quality of graduate students and success in placing them in appropriate careers after they graduate.
- Continue to work to strengthen the Appointments, Promotion, and Tenure process and intensify mentoring of junior faculty within departments.

## **Goal 2: Significantly Strengthen Science and Engineering at Duke**

Historically, Duke has not developed strength across the sciences commensurate with the University's quality in other major areas of intellectual inquiry. We have the strategic opportunity to redress this imbalance in quality, by taking a national and international leadership role in a number of targeted, dynamic areas of science and engineering. Historically, Duke has been strong in the life sciences: our newly unified biology department is outstanding and our medical school is among the very best in the world. To attain excellence more broadly, we must concentrate and expand faculty in areas of strategic scientific and engineering priority, and deepen the resources available to our physical scientists and engineers. Space is a particularly acute problem in this regard, as many of our science and engineering buildings are in need of renovations to meet the current technological needs of our faculty. We cannot recruit top-flight scientists and engineers unless we offer them cutting-edge facilities, nor can we serve our students as well as we should. Laboratory equipment is expensive and must be upgraded through instrumentation funds and start-up funds for new faculty. We also have significant computing and other instrumentation needs for both research and instruction that will require a mixture of internal funds, grants, and philanthropy.

Scientific research is problem-driven, requiring the integration of expertise across disciplinary boundaries if scientific knowledge is to advance and be effectively applied to society's aid. The current intellectual frontiers increasingly require an interdisciplinary approach, a fact that is strongly reflected in today's funding trends. Furthermore, the interrelationship between research and teaching is more important than ever before. This calls for a high degree of integration of our activities as we strengthen our programs—both vertically, through increased emphasis on building communities in which faculty, postdoctoral scholars, graduate students, and undergraduates work in teams, and horizontally, in collaborations across the University.

The most difficult part of planning in the sciences and engineering is determining where the important opportunities for Duke will lie. It is easy to follow today's trends, difficult to see tomorrow's. For this reason a combination of ideas from below with analysis from above has driven our planning. We have examined scientific developments and trends in funding agencies. At the same time, we have promoted a vigorous process to promote cooperative faculty thinking. A provost-level working group has solicited, culled, and synthesized white papers expressing the vision and interests of the faculty to determine how best to concentrate Duke's resources for the future. Planning led by the deans in the schools has also been driven by ideas put forward by departments, programs and centers.

Based on this process, we have put together a selected set of high potential intellectual initiatives that we believe will take maximum advantage of our current strengths and position Duke to be a leader in scientific research in the next decade and beyond. The most exciting opportunities for Duke lie in the areas of genomics, neuroscience and neuroengineering, global change, materials, and photonics. We are planning flexible programs in these areas that will have an impact on every science and

engineering department on campus, as well as many in the School of Medicine. There is a deliberate biological and biomedical bias in all of these initiatives as we attempt to leverage our strength in the life sciences. In addition, several of our programs—genomics, neuroscience, and global change—will also interface with related programs in the social sciences and humanities, where their excellence will help to create programs of national and international quality and prominence.

These new initiatives will be carefully implemented to have maximum impact on our natural science and engineering departments. We also have several existing programs of true national and international excellence that will provide support for these efforts as they move forward. These include:

- The Center for Chemical Biology
- The Center for Cognitive Neuroscience and the Brain Imaging and Analysis Center
- The Center for Computational Science and Engineering
- The Center for Nonlinear and Complex Systems
- The University Programs in Developmental Biology and Genetics

We will work hard to support these ongoing programs and coordinate their continued growth with our priority new initiatives.

We will continue our core support for the science departments themselves, as they are the backbone of the science and engineering enterprise. However, significant reallocations of strength will take place as we direct available faculty positions, space, and other resources to the new and ongoing priorities. In particular, we will seek to facilitate interactions between theoretical, computational, and experimental areas.

### Actions

In addition to undertaking the new initiatives, which are described more fully in Part Three, we need to take the following actions to strengthen the science and engineering enterprise at Duke:

- 1. Improve Space for Science and Engineering.**
- 2. Increase Campus-Sponsored Research.**
- 3. Improve Instrumentation by Creating New Shared Instrumentation Facilities.**
- 4. Provide Proper Support for High Performance Research Computing, Data Storage and Visualization.**
- 5. Promote Increased Collaboration with the School of Medicine.**
- 6. Promote Industrial Collaboration and Encourage Technology Transfer.**
- 7. Expand the Role of the Sciences in Curriculum 2000.**

## **1. Improve Space for Science and Engineering.**

Improved space is the greatest need in science and engineering at Duke. We cannot improve the quality of our faculty and programs in these areas without improving the quality of the teaching and research space available to them. Recent external reviews of the departments of chemistry, biology, mathematics, and physics have all emphasized the need for Duke to address the state of our facilities. In a number of departments, the issue is not only the quality of space but also its quantity and allocation. Allocation issues are particularly acute in Arts and Sciences. But these departments, as well as the department of psychology: experimental and in the Pratt School, there is an absolute shortage of space so significant that it inhibits the ability of highly productive and well-supported researchers to reach the full scientific and funding potential of their current research programs. Fortunately, space is not a significant problem for computer science or ISDS, and plans are under development for new spaces for engineering and psychology-experimental. However, there are significant future needs, especially for the renovation, expansion, and, in some cases, reallocations of our research and teaching laboratories.

Planning for the following is already underway:

- Construction of an Institute for Interdisciplinary Engineering and Applied Sciences, providing space for bioengineering, photonics, and materials science that will serve engineering faculty as well as providing some laboratory space for faculty in Arts and Sciences and the School of Medicine. In addition, we will then have to undertake “backfill” renovations for Hudson Hall;
- Movement of part of psychology-experimental into the new laboratory building for the Center for Human Disease Models;
- Renovation of selected laboratory space in the Biological Sciences Building for both research and undergraduate teaching.

Other needs that will be addressed as funds become available, and as a master planning study for science facilities is completed, include:

- A new science building providing teaching and research labs for chemistry and biology;
- Renovating the Gross Chemical Laboratory Building;
- Further renovating the Biological Sciences Building;
- New space between the Biological Sciences Building and the Physics/Math Building to address space shortages for Mathematics and Physics;

- Renovating the Physics/Math Building;
- A unified science library to serve the natural sciences and engineering.

Though still in preliminary formulation, this is an ambitious facilities program. Several factors provide context for these critical needs. As the University's last long-range plan was completed in the fall of 1994, the LSRC was just coming on line after almost a decade of planning and construction. In addition to serving a variety of Medical School programs, the LSRC provided a home for the newly created Nicholas School of the Environment, the department of computer science, selected biomedical engineering research programs, and the Arts and Sciences research group in Developmental Cell and Molecular Biology (DCMB). Since that time, we have proceeded opportunistically, making isolated program and facilities improvements (for example, the creation of the exciting new Cognitive Neurosciences Program and the up-fitting of approximately 12,000 square feet of shell space within the LSRC to accommodate it, as well as the renovation of laboratories in the basement to support two chemistry faculty), but without a comprehensive long-range plan for either science programs or their facilities requirements. In the current process, we are determined to conduct science program planning and facilities planning in tandem. In order to have first-rate programs in the sciences, we must have first-rate facilities. Recent external reviews and recruitment and retention discussions have demonstrated that, with isolated exceptions like the LSRC or the Free Electron Laser Laboratory (FELL), our science facilities outside the medical school are not capable of supporting world-class teaching and research. Fortunately, we can develop the resources to address this need—see our financial planning section in Part Seven (Implementation) of this plan—and thereby create the possibility for building our priority programs.

## **2. Increase Campus-Sponsored Research.**

Our first priority at Duke will always be to encourage and support research of the highest quality. We will not develop programs or reward faculty success solely on the basis of funding, since not all high-quality research is fundable; and, conversely, not all funded and fundable research is of the quality to which we aspire. Therefore, we seek to develop programs concentrated in the most important intellectual areas. However, research in science and engineering is expensive, in terms of both personnel and facilities. Therefore, no university can afford to ignore funding opportunities in making judgments about which programs to support. If we are to make the investments that significantly strengthen science and engineering at Duke, we must increase our presence in areas that are both at the research frontiers *and* sustainable through external support.

The planning report submitted by the Interim Vice Provost for Research highlights a variety of weaknesses in the overall environment for sponsored research on the campus (that is, non-medical) side of the University. Too few faculty are funded at the levels available to them and too many faculty work in areas in which less funding is available. Here are some steps that we will undertake to address this problem of balance:

#### a. Encourage More Proposals from More Faculty

Currently, 5% of the faculty who work in areas in which research funding is available are responsible for more than 50% of research expenditures at Duke. This number is significantly lower than that of the institutions with which we compete. More than 10% of campus funding is in one unit, the Free Electron Laser Laboratory. Only 8% of eligible faculty have 3-year funding that exceeds \$1M and 50% have no significant funding at all. This situation, especially the fact that half of our science and engineering faculty have no funding, is unacceptable and *must* be addressed if we are to improve the research enterprise at the university.

Rectifying this situation will require three things: increasing the percentage of faculty on campus who are capable of receiving research funding, reducing the percentage of fundable faculty who are currently unfunded, and encouraging those who are currently receiving funding to increase their productivity. There are many mechanisms to address the second and third issues, and these are discussed below. The first requires putting more emphasis on hiring in areas of available funding as well as ensuring that those we hire are of the highest research quality and that they understand our expectations with regard to research productivity. More generally, enhancing our research quality, productivity, and funding will require a shift in our science and engineering research *culture*, a task that will require the sustained engagement of the Provost, Vice Provost for Research, and the deans and chairs of the relevant schools and departments. Specific steps related to this cultural change are discussed in the following paragraphs.

#### b. Make Space, Salary, and Graduate Student Support Dependent to Some Degree on the Level of Sponsored Research in Areas Where it is Available

We cannot afford to provide expensive research space to faculty who are not research productive and/or are not receiving significant external funding for that research. We must therefore create an equitable system that enables us to account for research (and other) space utilization and that allows for the reduction of space allocations to those who are not research productive or funded after a period of time. In addition, incremental salary and funding for graduate student research should in part be tied to research productivity. The latter is important not only for financial reasons but also for recruitment and placement of graduate students, since research funding is linked to trends in science and corresponding employment opportunities and is therefore an indicator of which faculty should be directing Ph.D. theses.

#### c. Provide Internal Funding in Directions of Strategic Importance When There Is Promise of Increasing Outside Support

An excellent use of central and school resources is to provide for instrumentation, start-up funds, graduate student and post-doctoral support, and other seed funds when that support is in directions of strategic importance and holds clear promise for encouraging

new grant opportunities. Central support can take the form of direct grants, matching funds, and loans where appropriate.

d. Provide Travel Funds to Principal Investigators to Meet with Agency Program Directors and Occasional Release Time for Proposal Development in Strategic Areas

Program directors of federal agencies welcome visits from faculty who are interested in submitting proposals, especially in areas of emerging national importance. However, travel funds from research grants cannot be used for this purpose. Encouraging such travel is an effective way to help ensure that our faculty are not only in touch with, but also are helping to shape, new programs in Washington.

e. Provide Increased Support to Faculty for Writing and Managing Grants in Departments and in the Office of Research Support

Within departments, there is need for increased assistance in identifying grant opportunities, preparing grant applications, and administering grants. We will provide, when appropriate, seed funding for the development of new proposals, especially in support of new initiatives and programs at our institutes. We will also study whether there is need for a higher level of service from the Office of Research Support and make staffing changes as needed.

f. Establish a Research Council of Faculty to Advise the Vice Provost for Research

In order to ensure institutional support, funding agencies often limit the number of applications that an institution can submit to a program. Advice about proposals that serve the larger agenda is best given by a faculty council.

**3. Improve Instrumentation by Creating New Shared Instrumentation Facilities.**

We plan several shared instrumentation facilities so that equipment that is too expensive for a single unit can be shared and supported by common staff. These facilities include:

- A Shared Facility for Materials Science, Engineering, and Photonics;
- Photonics;
- A Bioinformatics Laboratory;
- A Centralized Facility to Support High Performance Computing;
- Shared Mass Spectrometer Facilities.

Each of these facilities is in support of a University initiative and a mixture of instrumentation grants, start-up funds, and other internal funds will pay for the necessary equipment. Each facility will have a director, a scientific advisory committee, and adequate support staff so that faculty will be attracted to using it. The University will support these facilities by a mixture of sources including usage charges, indirect cost

recovery, and other central and school funds. The scientific committee will be responsible for scheduling usage of machines through a competitive process such as the submission of short proposals for experiments. Adequate support staff will be made available so that faculty will be drawn to the central facility instead of attempting to recreate their own.

#### **4. Provide Proper Support for High Performance Research Computing, Data Storage, and Visualization.**

There are three areas of computation that will grow significantly in the near future and that are central to research in science and engineering: the storage and analysis of very large databases, high performance (parallel) computing, and scientific visualization. These three areas are intimately linked and must be supported together. The costs for mass storage and other equipment are large enough and the bandwidths available today are adequate to suggest sharing resources to support these needs for a variety of research groups on campus. Perhaps more importantly, sharing systems support personnel between groups will allow us to hire not just systems administrators but experts in each of these three specific areas who can aid faculty in solving the new kinds of problems they will confront in the future. We will therefore develop a model built on a mixture of centralized and decentralized resources to support our efforts in bioinformatics and computational biology, neural analysis and neuroengineering, global change, geographic information systems, multi-scale modeling, and others.

#### **5. Promote Increased Collaboration with the School of Medicine.**

In addition to the new effort in genomics, several ongoing programs involve faculty from campus and the School of Medicine. These include the Center for Chemical Biology, the Center for Health Policy, the Institute for Care at the End of Life, and several others. New opportunities are emerging as the need for broader expertise to address health care research increases.

However, our biggest problem is finding ways to work together across school cultures that are so significantly different. In the basic sciences, most faculty members do not teach undergraduates and are expected to raise a significant portion of their own salary through research grants. In the clinical sciences, faculty can only do research to the extent that they can find external funding. The advent of managed care and other critical changes in the medical profession have put tremendous strains on Medical School faculty. Yet at the same time, the incredible changes in biomedical and biological research brought on by the genomics revolution, and the increased importance of information science in biological research, demand an increased collaboration between campus and medical faculty.

Existing programs that are working well include:

- Chemical Biology;
- Cognitive Neuroscience and the Brain Imaging Analysis Center;
- The University Program in Genetics;
- The University Program in Cell and Molecular Biology;
- The Program in Bioengineering;
- The Center for Health Policy, Law and Management;
- The Institute for Care at the End of Life.

New opportunities include:

- The Institute for Genome Sciences and Policy (IGSP);
- A Broadening of the Program in Neuroscience;
- The Human Vaccine Institute;
- Campus Experiences for Medical Students (especially in their third year program); Integrative Biology (Integrative Biology refers to the in-depth study of model organisms, including humans. Functional genomics demands that we start to study intact organisms to really understand gene function.);
- Health and Environment;
- A new program in atmospheric particulants;
- Integrated Toxicology Program;
- Other opportunities at the National Institute for Environmental and Health Sciences located in Research Triangle Park may be growing;

## **6. Promote Increased Collaboration with Industry and Encourage Technology Transfer.**

Technology transfer has to date been far more developed in the Medical School than on campus. Again, this is in part a cultural issue: campus faculty have only recently begun to engage the entrepreneurial opportunities that have been recognized earlier among clinical and basic science faculty. It has also been an issue of the failure to adequately provide appropriate infrastructure for technology transfer on the campus side. Recently, the Office of Science and Technology (OST, the “Technology Transfer” Office) has been making efforts to provide its services to campus faculty as well as to the Medical Center.

These efforts are to be strongly encouraged, and the Vice Provost for Research is expected to work closely with the deans and faculty on the campus side, and with the OST, to substantially increase technology transfer efforts. Opportunities are already increasing for collaborations with industry, especially in engineering. Many of the new initiatives in Pratt have significant industrial partnerships. We must work to intensify these even as we seek to expand the scope of other initiatives. It is possible, for instance, that one or more campus “incubators” should be developed. A separate planning report

on technology transfer will be developed in the coming months; Part Four (Administrative), however, elaborates on this point.

## **7. Expand the Role of the Sciences in Curriculum 2000.**

It is important to continue to work on expanding the role of the sciences in Curriculum 2000. Science courses provide excellent opportunities for undergraduates to conduct research, to gain expertise in technical writing, and to assess the ways in which scientific issues have an impact on society. The new liberal arts curriculum requires that all Trinity students engage with mathematics and the natural sciences as well as issues in science, technology, and society (STS). If we are to fulfill our aspiration to educate the leaders of the future, we must provide our students with an appropriate command of scientific concepts, language, and methodology. As a part of this effort, we will place emphasis on creating more courses for non-science majors; increasing the role of both science and engineering in the FOCUS program; providing capstone experiences; and expanding the Center for Teaching, Learning and Writing to include expertise in the pedagogy of the scientific disciplines.

### Assessment for Goal 2

Mechanisms for assessing and benchmarking progress towards all nine goals are laid out together in Part Seven (Implementation) of this plan. To monitor our progress towards Goal 2, we will:

- Monitor progress towards improving our infrastructure for science and engineering, including new facilities, renovations, instrumentation, computational facilities, and other infrastructure improvements.
- Continue to keep careful watch on the status of external funding for research.
- Track industrial collaborations and patents to gauge our success in technology transfer.
- Assess the role played by the sciences in Curriculum 2000 as part of regular the assessment of that program as it moves forward.
- Monitor recognition by scientific societies, especially the national academies.

### **Goal 3: Be Among the Best Universities at Integrating Teaching, Learning, and Research**

The strongest educational advantage offered by a research university is the ability to build the student experience on the scholarship of the faculty, and the best way to convey that scholarship is by exposing students to the research process underlying that scholarship. Through research, students learn to grapple with problems, to formulate questions, and to analyze arguments and information. They come to see themselves in new ways and identify rewarding career paths. They also develop relationships with faculty as individuals and come to understand that they have common interests and capabilities. Additionally, research must ultimately be understood by society; and if we are in the business of educating leaders for that society, it is imperative that our students learn something about the ideas, techniques, and methodologies of modern research and understand the impact of research on our daily lives.

Perhaps more than anywhere else, Duke has the opportunity to distinguish itself in integrating teaching, learning, and research. We aspire to be both one of the top research universities and one of the best undergraduate institutions, and we must coordinate our efforts to reach these twin goals. This will require creating an environment in which training and research go hand in hand and are not seen primarily as competitors for faculty time. In the best instances, these enterprises converge.

*Students often learn best by doing.* Frequently, the term “learning by doing” refers to a paper or report that represents a student’s own original interpretation and argument, based on in-depth research and thinking. But it can mean a variety of other experiences as well, including hands-on experiences in classrooms and other learning environments, along with increased use of online mechanisms for student-to-teacher and student-to-student interactions. We will continue to emphasize inquiry-based learning situations and educational opportunities that are research-related.

It is our goal to increase the number of Duke students who reach a significant understanding of what research entails. Combining research experiences with community service, where possible, is also an important way to work simultaneously toward more civic engagement of our students.

We must also ensure the coordination of new educational programs with new research areas, especially as new initiatives develop across school lines. Our program in genomics, for example, should have a significant impact on the undergraduate, graduate, and professional curricula. New courses are already being offered in bioinformatics and computational biology at the graduate level. Undergraduate courses will soon follow. Similar programs will emerge in the ethics, law, and policy arena as well as in such areas as history and literary studies, since interest in genetics, genomics, and eugenics has a long and complex past from which we can learn. More generally, curriculum development will be an important expectation of our new initiatives.

One focus for our efforts to enhance the relationship between teaching and research will be increased efforts at “vertical integration.” Broadly speaking, vertical integration is the creation of environments in which faculty and students interact with one another in a way that is profitable for all. Such environments provide opportunities for undergraduates to see the life of a graduate student and to work at a more advanced level, and for graduate students to better understand their subject and learn mentoring skills. A vertically integrated research project, for example, typically links faculty, graduate students, and undergraduates; the professor’s experience and vision determine and guide the project, often one that has considerable significance to his or her research program. The postdoc, a professor in training, is given the day-to-day management of the project. Graduate students, just learning what it means to do significant research, are each given one aspect of the project to see through. And undergraduates, who have mastered certain important skills and are filled with excitement, provide the energy and perseverance to complete the task. In many disciplines, most notably in the laboratory sciences, the vertical model is already widely used. Our goal then is to find mechanisms to adapt this model for use in other arenas. We intend to develop programs and incentives to promote this type of integration. In this regard, perhaps our greatest deficiency is in the linkage between the graduate and undergraduate levels. To address this will require continued adaptation of the teaching assistant model to different learning environments.

Another model for broad-scale vertical integration is the University Scholars Program, which will reach a steady state of 70 undergraduate, graduate, and professional school students by 2002; the program creatively utilizes interactions among these groups, as in its seminars on topics to which all can contribute. Capstone experiences that incorporate the research requirement of Curriculum 2000 with existing intensive research experiences, perhaps with an established research team, are also excellent components of vertical integration.

### Actions

In support of these ideas we will undertake the following actions:

- 1. Create More Opportunities for Students to Participate in Research.**
- 2. Provide More Opportunities for Research-Related Service Learning.**
- 3. Introduce New Curricular Programs with Each New Research Initiative.**
- 4. Support Programs of Vertical Integration.**
- 5. Focus Information Technology Investments on Enhancing the Integration of Research and Learning.**

### **1. Create More Opportunities for Students to Participate in Research.**

Duke is committed to having the research experience be a distinguishing characteristic of the undergraduate experience and degree. To accomplish this, we will need to add to and expand on current programs that fit well into the academic year as well as short-term experiences that could be completed in the summer. Summer

Research Experiences for Undergraduates (REU) and other federally supported programs provide excellent formats. Summer research projects for graduate and undergraduate students alike will be created in initiative areas.

## **2. Provide More Opportunities for Research-Related Service Learning.**

We can simultaneously address our civic mission, our responsibility to educate students for leadership and service, and our emphasis on undergraduate research by promoting environments for research service learning. When research is joined with service learning, the outcome is a deeper level of inquiry-based field research that not only builds leadership and life skills but also helps shape students' identities as agents for activism and change in the community. We plan to create research service learning clusters that are composed of both curricular and experimental components. Each cluster will build on current research by Duke faculty that is community-based or has community relevance. These clusters will consist of gateway courses, intensive community-based research experiences, and capstone experiences. These clusters will be important parts of the implementation of Curriculum 2000.

## **3. Introduce New Curricular Programs with Each New Research Initiative.**

Since our goal is the successful integration of research, learning, and teaching, it makes sense to encourage and support new educational developments in the areas that the faculty find the most dynamic and exciting. A good example is the collaborative effort of the Center for Cognitive Neuroscience and the department of psychology-experimental to enhance and strengthen our undergraduate neuroscience program. At the introductory level, we added a sleep lab to the existing first-year FOCUS cluster "Exploring the Mind," a cluster designed to investigate the computational and biological foundations of higher mental processes, including attention, memory, and consciousness. Funding from the Howard Hughes Medical Institute has allowed the development of several advanced laboratory courses, taught by faculty from the Center for Cognitive Neuroscience and from the medical center. Howard Hughes money has also established the senior capstone course in neuroscience that helps to fund junior and senior neuroscience students doing laboratory research. The Center has also profited from the development of the core lecture course "Fundamentals of Neuroscience," taught by psychology-experimental faculty with invited lectures and demonstrations from Center and neurobiology faculty. In each of these courses, undergraduates get exposed to and take part in ongoing research of faculty from numerous departments and units in both Arts and Sciences and the medical school.

This model demonstrates how departments and centers can work together to enrich the research opportunities, courses, and laboratory offerings available to undergraduates. Students likewise can progress with ever-increasing sophistication through research experiences that provide hands-on opportunities for investigation and experiment design.

#### **4. Support Programs of Vertical Integration.**

Departments and centers will be encouraged to develop models in which faculty, postdocs, graduate or professional students, and undergraduates interact as part of a larger community of research, learning, and teaching. Curriculum 2000 and new proposed initiatives under consideration in the Pratt School of Engineering seek to intensify undergraduate research experiences, utilizing both professors and graduate students. The department of mathematics, for example, is currently supported by a grant from the National Science Foundation ("Vertically Integrated Grants in Research and Education") and has developed a model that could be adopted by other departments. The collaboration between the Programs in Cognitive Neuroscience and the Brain Imaging Analysis Center includes significant interaction between faculty, postdocs, and graduate and undergraduate students. The Franklin Institute is developing another model that may be more appropriate for the humanities.

In this connection, it is also necessary to provide intensive, often interdisciplinary, research experiences to the best and most engaged of our undergraduates. As discussed earlier, building capstone experiences for undergraduate seniors that involve intersecting courses and concentrated research undertakings is one of the tools we need to employ in order to enrich the undergraduate research experience.

#### **5. Focus Information Technology Investments on Enhancing the Integration of Research and Learning.**

Much of the section on the integration of information technology is focused on the integration of research and learning. To ensure that these information technology investments have maximum impact on this integration, we will ensure that they support:

- Courses that address the research component of Curriculum 2000;
- Integration of efforts by the Center for Instructional Technology with developing research programs;
- Creative application, use, and demonstration of new technologies that have changed information, archive, and methods in the full range of academic fields.

#### Assessment for Goal 3

In assessing our success in attaining Goal 3, we will look at the following indicators:

- The number of undergraduates who engage in research.
- The number and variety of vertically integrated projects, many of which have already begun on campus.

- The degree to which departments are able to incorporate research into their curricula. This will be an excellent benchmark for the success of the research requirement of Curriculum 2000.

#### **Goal 4: Promote Major Multidisciplinary and Interdisciplinary Programs**

Our assessment of the external environment in which our university operates leaves absolutely no doubt that the emphasis on problem-driven, multidisciplinary, and interdisciplinary research and training will continue to increase in the future. At most universities, strong disciplinary traditions, along with the strong academic and often financial independence of departments and schools, discourage broad interdisciplinary and multidisciplinary collaborations. At Duke, however, our youth, comparatively smaller size, relatively concentrated campus, and evolving culture of interdisciplinary cooperation have provided us with a comparative advantage in seeking to foster collaborations among faculty. Much is already happening across department lines, but we must continue to strengthen our efforts to develop this advantage to the fullest. For that reason, we have worked hard in our planning process to develop initiatives that cut across departmental and school boundaries. By promoting broad-ranging programs, we will position ourselves in the center of the most dynamic academic areas while assuring that our investments in faculty and facilities have maximum impact. Our students will also be beneficiaries of this multidisciplinary perspective as it better reflects the kinds of real-world environments in which most of them will spend their working lives.

In addition to creating new initiatives where appropriate, we must strive to manage the delicate balance between research and teaching *within* the disciplines and that which happens *outside*, in non-departmental settings. Centers and departments compete for resources; our management, reward, and incentive structures must be designed to minimize this competition. New major centers should be created with careful criteria predetermined for their success, all major centers should be evaluated regularly (as is the case with departments), and new and old centers and like programs should have sunset clauses attached to the outcomes of these reviews. In turn, our departments must be encouraged to see the outside efforts of their faculty as an important aspect of the department's role in the University. At the same time, we must develop faculty accounting systems so that the work (scholarly, administrative, and pedagogical) done outside a department also "counts" toward one's total contribution to the good of the University, even when it is sometimes invisible to one's home department. Finally, in such evaluation processes as AP&T, we need to create ways to account for interdepartmental and inter-school contributions as well as to appreciate interdisciplinary reputations and standards (which, in some cases, may differ from the disciplinary evaluation). Often the greatest difficulties in this regard arise at the department level. As a result, the Provost and deans must work to assure that scholars with interdisciplinary interests and engagements are appropriately evaluated. This can occur through intervention at the time of the establishment of the review committee to assure proper representation from the interdisciplinary area, even if outside the department, and through independent evaluation of interdisciplinary contributions in support of the dean's consideration of the case.

Several of our most exciting new programs will cut across divisions of the university in unprecedented ways. Our science and engineering program in global change will parallel a social science program in environmental solutions as faculty in

both groups recognize the impact of developments in environmental law and policy on environmental science and engineering, and vice versa. Our Institute for Genome Sciences and Policy has a similar reciprocity as scientists recognize their inability to do their work in isolation from the legal, policy, philosophical, historical, and ethical questions that future developments in genome sciences will bring. Our bioengineering program is expanding significantly. We plan a broad program in neuroscience and neuroengineering, accompanied by a reorganization of the department of psychology-experimental into a department of brain and psychological sciences. Our proposed Americas Studies Program will combine the range of humanities and social science perspectives with policy, legal, and business perspectives in order to foster understanding of the increasingly complex interactions of the various nations that inhabit the land masses of North and South America and the Caribbean. The John Hope Franklin Center for Interdisciplinary and International Studies has already begun to gather together humanists, interpretive social scientists, and artists to bring comparative, philosophical, and historical perspectives to bear on race, equity, and other issues of enduring human value and understanding. And programs such as African and African-American Studies and Women's Studies have now well established multidisciplinary traditions in hiring and linkages to departments throughout the University. Even in such areas as renovating Perkins Library, we are re-thinking the basic functions and future of a library. We must consider ways that books and other sources of information (from advising to the Internet) might be brought together to serve one another and the varied research interests of our faculty and students rather than to compete with one another. In all these cases, the end product is enriched and facilitated by our re-thinking of the typical academic divides that separate the humanities, social sciences, and sciences, and our attention to the increasing integration and interdependence of different kinds of knowledge and expertise.

A particular challenge is to develop new graduate programs that mirror the changes we see in research. An important new model is that provided by the ecology program, where a new Ph.D. that integrates faculty interests across the boundary between Arts and Sciences and the Nicholas School of the Environment may prove to be the model for the future. Other challenges include a possible broadening of Ph.D. training in neuroscience; a planned Ph.D. and undergraduate program in bioinformatics and computational biology; and other efforts that develop each time a new faculty research group emerges across campus. The plan of the Graduate School is attuned to this need, and we are fortunate to have resources there for these new programs.

Another high priority is to develop a program in information science and information studies that spans all divisions of the University and addresses fundamental intellectual questions posed by the pace of change in the availability of information, how it is managed, and how it is used in our society. We envision a program that will promote interchange between researchers and students in computer science, computational science and engineering, commerce, sociology, science studies, legal theory, histories of information technology, aesthetics (art and graphic design), and other disciplines.

## Actions

In support of these priorities, we will undertake the following actions:

- 1. Develop and Expand Inter-School Initiatives in Key Areas.**
- 2. Continue Support for New and Ongoing Initiatives in the Future.**
- 3. Create and Support Opportunities for Faculty and Students to Broaden their Interactions with Those from other Disciplines.**
- 4. Manage our Centers More Effectively.**
- 5. Encourage Interdepartmental and Interdisciplinary Courses and Programs.**
- 6. Better Coordinate our Activities with Other Institutions in the Research Triangle Park Area.**

### **1. Develop and Expand Inter-School Initiatives in Key Areas.**

In order to promote interdisciplinary programs and to leverage faculty strength, we plan to undertake a number of new initiatives. These are described in Part Three of this plan. In addition to these, there are a number of inter-school initiatives and programs described within the school plans. These include:

- Bioengineering – Pratt School of Engineering and Medicine;
- Innovation and Entrepreneurship – Pratt School of Engineering, Arts and Sciences, and Fuqua School of Business;
- The Institute for Care at the End of Life – Divinity, Medicine, Arts and Sciences, and the School of Nursing;
- The Integrated Toxicology program – Medicine and Nicholas School of the Environment.

### **2. Continue Support for New and Ongoing Initiatives in the Future.**

In addition to the initiatives that are described in Part Three of this plan, we will keep aside adequate funds to allow us the flexibility to take advantage of new opportunities as they arise. Certainly, many of our already existing programs are very strong and may be ready to move to new levels of activity in the near future.

### **3. Create and Support Opportunities for Faculty and Students to Broaden Their Interactions with Those from Other Disciplines.**

As discussed earlier, the Provost's Initiative Fund, the Smith Fund, and the New Beginnings Fund provide support for individual faculty interested in expanding their

research and teaching frontiers by learning the language and culture of another discipline. Groups of humanities and social science faculty can come together for a period of intense collaboration in the Franklin Institute. We will continue to look for every opportunity to support faculty who want to work together.

#### **4. Manage our Centers More Effectively.**

As exciting as it is to create an innovative new center, it is important to acknowledge that centers sometimes outlive their usefulness. We are thus working by which to ensure that new centers have bylaws that require an evaluation and a review mechanism to determine whether or not they should continue. The review will assess the “value-added” of the center to existing programs, the ability of the center to secure external funding, the synchrony between the center and other programs (including both departments and other interdisciplinary centers), and the ability of the center to attract, retain, and support the best faculty, students, and courses. We expect to undertake such reviews of existing centers within the next three years on a staggered basis. All new centers are already required to establish benchmarks, review timelines, and assess the potential for sunset at the time of “sunrise.”

At present, we have done a preliminary inventory of all interdisciplinary units on campus to determine internal and external funding levels and present levels of curricular and research activity. In December, when we have refined our own inventory, we will send a survey to all directors of interdisciplinary units requesting that they verify and/or update our information. Even at this preliminary stage, however, we have determined that Duke is spending few tuition dollars on these interdisciplinary units. Our preliminary inventory reveals that very few of the units require unrestricted funds from the University and, of those that do, most are well on their way to receiving external funding. Many provide curricular and research enhancements beyond individual departments, and most are self-sustaining.

#### **5. Encourage Interdepartmental and Interdisciplinary Courses and Programs.**

Currently Duke has significant barriers to offering courses in the most expansive experimental models. The most notable of these barriers is the cost of developing such a model. We will create a specific fund to encourage the development of innovative methods of cooperative or team teaching across departments and schools. This will be a competition jointly advertised and endorsed by the Provost and all of the deans, with invitations for support for curriculum development.

A model for the sort of dynamic team-teaching we would like to encourage was outlined by the Arts and Humanities Working Group with their concept of Teaching-Learning Communities. In such a community, four or five faculty might work together on some large-scale issue about which each might be expert in one aspect. They would develop a course together and offer it at the 200-level so that advanced undergraduates

and graduate students could take it. The renovated Hanes Annex that houses the Franklin Center for Interdisciplinary and International Studies is a perfect place to host such an experimental course or cluster of courses.

## **6. Better Coordinate Our Activities with Other Institutions in the Research Triangle Park Area.**

Research Triangle Park is one of the fastest growing and most dynamic areas in the nation. Especially in those areas in which Duke does not and cannot have the critical mass of faculty to compete at the very top levels nationally, the potential to coordinate our programs locally is a significant opportunity for achieving excellence. A number of the new programs that we are developing could be much more effective if they were better coordinated with related efforts at our sister institutions and with local industry.

One area in which we plan to make special efforts is genomics. North Carolina State University has an already established, excellent program in bioinformatics and UNC-Chapel Hill has recently taken steps to develop one. There is great interest at the North Carolina Supercomputing Center (NCSC) in supporting computational efforts in genomics, and possible cooperative arrangements exist with SAS, Smith-Kline Beecham, and others. The North Carolina Biotechnology Center has recently formed a coalition to support developments in genomics statewide and Duke is becoming a partner in this effort.

Some additional new exciting opportunities include:

- Potential relationships between environmental science and medicine, working with the National Institute of Environmental and Health Sciences, located in the Triangle;
- A new joint program between Duke, UNC, and Stanford in the applications of computer science to molecular biology (funded by the Information Technology Research program of the National Science Foundation);
- A cooperative effort being developed with NCSC to support mass storage, high performance computing, and visualization in support of a variety of research programs across the university;
- Continued collaboration on our international programs, including several of our Title VI grants;
- Working toward greater collaboration and shared facilities in the arts in order to take advantage of the richness of our increasingly diverse and cosmopolitan population.

Another great opportunity for Duke lies in its newly acquired co-management role at the Oak Ridge National Laboratories (ORNL). Duke, Florida State, Georgia Tech, NC State, the University of Virginia, Virginia Tech, and Oak Ridge Associated

Universities share management responsibility with UT-Battelle of ORNL. In return we have access to research facilities far beyond those we could provide at the University.

#### Assessment of Goal 4

To monitor our progress towards Goal 4, we will:

- Track, to the extent possible, the success of our faculty in attaining grants that support interdisciplinary research. Increasingly, funding agencies are looking to support interdisciplinary teams of researchers and making funding decisions based on the ability of the team to solve important problems.
- Make efforts to judge the extent to which our management of centers helps to ensure quality. In particular, we will attempt to assess whether this management ensures that faculty efforts are redirected into areas of strategic importance to the university.
- Work with our Triangle neighbors to assess our success in coordinating our efforts. In particular, we will evaluate the extent to which the Triangle universities and the Research Triangle Park are recognized as a coordinated national competitor, especially in areas where individual institutions cannot compete effectively alone.

## **Goal 5: Promote Diversity in All Aspects of University Life**

A community built around diversity in all its dimensions is critical to the quality and success of the contemporary university. Creating the optimal environment for nurturing the talents of our students, faculty, and workforce involves more than attention to either the state of our classrooms, laboratories, and office space, or the extent of our resources, or the robustness of our technology infrastructure. The best living, learning, and working environment will be one in which its members are heterogeneous, offering different perspectives from which all can gain knowledge and skills. Thus, our fifth principle affirms the conviction that diversity is not an add-on or an afterthought, or a matter of mere enrichment, but rather an essential factor of crucial importance to our success in all aspects of university life—indeed, of life itself. Attention to diversity involves both ensuring access and making the University’s climate a welcoming and sustaining one for all. A commitment to diversity means helping all members of the community listen to, understand, and learn from each other.

The word *diversity* may by now be so familiar that (like the term *multiculturalism*) it seems a cliché, emptied of real content and hence easily ignored. However, the concept itself needs and merits reaffirmation (especially in the face of challenges to it), and until we have a fresher word, we will continue to use this one. We understand *diversity* to mean the full range of human difference and potential that manifests itself in individual members of a university community. This range includes many different dimensions—racial, ethnic, linguistic, and geographic backgrounds, religious beliefs, physical abilities, sexual orientation, socioeconomic class, political convictions, and lifestyle preferences.

There are many compelling reasons for promoting diversity at Duke. First, actively engaging such diversity is essential to a good education, as well as to a democratic, civil society. Those who learn only with and from those whose life experiences are quite similar to their own learn much less than those who share that learning with teachers and peers who approach the world from very different situations and perspectives. It is the unfamiliar that stretches us, not the already known. On the undergraduate level, the intimate East Campus experience for all first-year students, and the FOCUS program in which more than a fifth of them engage, encourage interchange in the dorms, classrooms, and dining hall—an integrated approach to education. We have thus laid the foundation for helping our undergraduates learn from diversity, but we have not yet built sufficiently on this foundation.

Second, diversity in educational experience also prepares students to work with and lead diverse groups of people. These skills will be essential to the success of our graduates in the years ahead, when economies are without borders, minorities become the majority in many parts of this country, and international political and cultural challenges are of profound significance. We would never choose to overlook the building of competencies in critical inquiry, reading, and writing, or, for that matter, in the use of technology; for we recognize the importance of these competencies for navigating the world as productive workers and good citizens. Just as we acknowledge our responsibilities for helping our students to build those competencies, so, too, we must help prepare our students for the diverse worlds they will encounter after graduation.

Third, we wish to attract to Duke the best talent, from all possible sources. The pools from which we recruit faculty, students, staff, and employees are becoming more diverse. If we limit our recruitment to those whose backgrounds most nearly reflect traditional characteristics of elite private university populations in the past, we will be excluding from our recruitment pools large numbers of highly talented people, and putting ourselves at a disadvantage when compared with more visionary institutions that recruit widely for every position. This means that we must also work to recruit greater numbers of women in those areas such as social science, natural science, engineering, and business where, in the past, women have been underrepresented.

But recruiting from diverse pools places a responsibility on the institution to articulate its valuation of all people and to insist on respect as an operative principle. If diversifying the student bodies and the workforce is essential to the success of an institution in the 21<sup>st</sup> century, then effectively managing diversity is essential to a well-run institution. We need to make sure that all those at Duke who hold positions of authority and responsibility, including faculty chairs, officers, supervisors, and student leaders, understand this truth and become more sensitive to issues of diversity and better prepared to manage them. At bottom this is a matter of simple human decency. In practical terms, an environment that is unfriendly to members of the community prevents the effective conducting of the community's business, be it teaching, learning, or working in the myriad jobs within our complex institution.

We wish, then, to promote not only diversity itself, but also a valuation of diversity. Doing the latter is a tricky business, given the different meanings that people ascribe to the word and the different opinions they hold on its various aspects. Our strategy for achieving the twin goal of access and community building is multi-pronged, including targeted efforts in recruitment, support, and retention of a diverse faculty, student body, and workforce. But these efforts cannot succeed without a commitment on the part of all of us to working through and understanding more fully what diversity means to our endeavor. We must attend to different meanings of diversity and deliberately open ourselves to new kinds of experiences and acquaintances. We cannot simply assume agreement in this complex and sensitive arena. We must find venues and make time for real conversations—conversations in which people feel comfortable speaking about their ways of being in the world, expressing concerns and anxieties about diversity, not just celebrating it.

If we fail to tackle this difficult and complex issue, we will pay the price of neglect in several ways. Not only will we lose the opportunity to attract talented students, faculty, and employees of diverse backgrounds, but also those who do come to Duke will waste precious time and energy in fighting “the system.” They will feel less than fully valued by the University, less than fully included in its mission, rather than directing their energies toward learning, teaching, and doing their jobs well and happily.

We must learn to see diversity as a source of strength rather than an irritant or challenge. Diversity leads to fresh thinking, innovation in problem solving, aesthetic creativity, and renewed wonder about the manifold aspects of our world. An attitude of inclusiveness, living comfortably with diversity, opens up the mind and the spirit, provides fertile ground for a better education, and makes a large, complex institution much more livable, enriching, and harmonious.

## Actions:

In support of these ideas we will undertake the following actions:

- 1. Ensure Student Diversity.**
- 2. Ensure Faculty Diversity.**
- 3. Ensure Workforce Diversity.**
- 4. Create and Support Research and Teaching on Intellectual Issues of Diversity.**
- 5. Explore Creative Ways to Promote Values of Diversity and Make the Climate More Welcoming for All Members of the Community.**
- 6. Insist on Diversity as a Criterion for Excellence in All We Do.**

### **1. Ensure Student Diversity.**

To better promote diversity, we will pursue new initiatives and continue ongoing initiatives on several complementary fronts. The planning document on undergraduate admissions and financial aid, for example, outlines a number of significant initiatives to increase undergraduate diversity through the targeted use of available financial aid funds as a result of the Campaign for Duke, as well as concentrated attention in the selection process to economic disadvantage. These efforts will increase socioeconomic diversity, provide financial aid for foreign students for the first time in Duke's history, and assure that existing financial aid packages are as attractive as possible in drawing financially needy students to Duke. The new residential life plan also seeks to promote diversity as a cornerstone. We want to extend the East Campus vitality throughout the residential experience of Duke undergraduates.

On the graduate and professional school level, each of the school plans addresses the specific mechanisms that the school will employ to assure the diversity of graduate and professional students. In several schools, it is clear that this effort builds on an already successful base (for example, the School of Law and Fuqua School of Business). We will work to ensure that all of our merit scholarship programs, on both the undergraduate and graduate level, also prize diversity.

While eschewing quotas, all schools at Duke University will seek to achieve diversity in our student body, especially in historically underrepresented areas and areas in which we lag behind our peers. They will continue to monitor their achievements.

### **2. Ensure Faculty Diversity.**

We will continue to seek the most talented, dedicated, accomplished, and diverse faculty. Through continuing support for the Strategic Plan for Black Faculty Development, we will work to make progress toward our original target of doubling the number of Black faculty at Duke over the decade from 1993 to 2003. Having moved from 44 regular rank Black faculty to 79 (including a change from 36 tenure track to 50),

we are in the right direction but must work hard to increase the number of tenure-track Black faculty. To do this, we have augmented the three-year walk-down subsidy to a five-year walk down for smaller schools. We have also created a new postdoctoral program, with a new student added each year in the sciences, social sciences, and humanities. In addition, the Office of Institutional Equity is now identifying universities that have been especially successful in recruiting minority graduate students in certain areas, so that we might develop linkages to attract these individuals to our ranks of postdocs and faculty.

We are beginning to explore various ways in which to expand our pool of faculty in other areas, including Latino/Latina, Asian American, and Native American faculty. A review of progress on the Black Faculty Strategic Initiative in 2003 will provide necessary information on the strategies for adding additional ethnic areas.

Finally, we must redouble our efforts to recruit women faculty in those areas where they are underrepresented—the social sciences, natural sciences, engineering, and business. Especially as more and more female students enter these areas, it is our responsibility to make sure that we have female mentors, scholars, and teachers in appropriate numbers.

### **3. Ensure Workforce Diversity.**

The Office of Institutional Equity and the Office of Human Resources have joined forces in strategic and fundamental ways to recruit a diverse workforce. To find pools of minority and women applicants, they are compiling a data bank of promising organizations in such fields as accounting, nursing, engineering, information technology, and student affairs.

### **4. Create and Support Research and Teaching on Intellectual Issues of Diversity.**

One such venue for research and teaching on diversity is the John Hope Franklin Center for Interdisciplinary and International Studies, which is committed to bringing new insights to age-old problems. The Center promotes innovative research and teaching on race, equality, and other fundamental issues of social life and human understanding, across national and historical boundaries. With such conversation, we hope to shape ideas, dialogue, and policy about diversity, not only at Duke but nationally. At the same time, the work of the Center lends intellectual support to Duke faculty who work in these research areas.

## **5. Explore Creative Ways to Promote Values of Diversity and Make the Climate More Welcoming for All Members of the Community.**

Attention to access issues is important, but addressing those issues is but the first step on the path to a true community. We have much more work to do in addressing issues of campus climate. For some members of our community with disabilities, the “terrain” is hard to navigate, whether we are talking about the rough pavement and heavy doors or the unaccommodating attitude of some faculty. For many undergraduates of color, the residential life system creates so un-welcoming an atmosphere on main West

Diversity should be woven into the evaluation of all managers, just as it has been added as a category of evaluation for all departmental and school reviews. Across the University, faculty, students, staff, and employees should be rewarded for placing a high priority on the building of community through policies, procedures, and programs.

#### Assessment of Goal 5

To monitor our progress towards Goal 5, we will:

- Continue to track the composition of our student bodies, faculty, and employees to indicate progress toward making Duke a truly diverse community. We will need to pay special attention to workforce mobility issues.
- Monitor the development of, and attendance at, programs centering on diversity. Curriculum 2000, with its cross-cultural competency requirement, is helping to integrate an engagement with diversity into the intellectual experience of every Arts and Sciences undergraduate. We wish to encourage learning through diversity in all aspects of campus life, including panel discussions, artistic performances, and food functions. Our students themselves have manifold creative programming ideas; we must provide them the appropriate resources—including physical space and funding—with which to put these ideas into action.
- Make use of the COFHE senior survey and alumni survey to help us gauge our progress.

## Goal 6: Intensify the Use of Information Technology

*Information technology is an integral and indispensable component of education and research in the 21<sup>st</sup> century.* That principle can only be fully supported by the thorough integration of information technology into all appropriate aspects of university life. This will require increased resources and the skill to direct those resources where they will have the greatest impact. We will focus on improving the effectiveness of teaching, communications, collaboration, and research through the use of new information technologies. We will also focus on the development of our research and educational programs on information technology and the impact it is having on our society today.

Appropriately used, information technology is a means to achieving a more effective teaching and research environment. It is increasingly possible to provide easy online access to class materials and software tools that facilitate learning. The advent of fast wireless networking provides an additional opportunity to make innovative use of technology both in and out of classrooms. Assessing what contributes to learning and what doesn't will be an important component of our efforts. Students still express their desire for face-to-face contact with the faculty and we will preserve this important aspect of the Duke education. Information technology will simply be used to create a rich environment that facilitates communication, learning, collaboration, research, and innovation.

As a private university, Duke does not aspire to be a leader in the use of distance learning to educate large numbers of students. Although distance learning will be incorporated into our strategy as we construct new programs at the University, especially in the professional schools, we will focus more on using technology to enrich the teaching and learning experiences of the undergraduate, graduate, and professional students we have on campus.

Thus, online learning is an integral part of our vision for education at Duke in the future. We will make course materials, discussion groups, and other technology tools available to our students wherever and whenever they need them. We set as a strategic objective the incorporation of some level of online learning into every appropriate class at Duke. We will emphasize the transfer of research ideas and energies into our varied training environments, including the classroom, the laboratory, and the many places in which our students carry out their own research. In addition, we will explore especially innovative uses of online and distance learning that can expand the educational experiences and horizons of our students on campus, our students abroad, and our alumni.

To accomplish this, we will implement **CITIE**, a Computer and Information Technology Intensified Environment at Duke. Described more fully below, CITIE has as its ultimate goal the creation of a campus-wide environment where all students and faculty are connected to each other and to the resources they need whenever and wherever they need them. We will begin the implementation of CITIE by requiring students to own computers (see the first action statement). In support of this requirement

we will develop wireless networking across campus to allow students and faculty alike to be connected to the resources they need whenever and wherever they need them. In instituting this requirement, our focus will be on capabilities, not on any particular technology. To make proper use of these capabilities, we will carefully incorporate them into the curriculum and provide appropriate training for students and faculty alike. This training will be tied to pedagogy, not just to the “nuts and bolts” of IT, and it will respect the fact that the use of information technology is highly discipline specific, not “one-size-fits all.”

As we implement CITIE, we will work to involve more of the faculty in decisions about information technology (IT). This will include our traditional faculty advisory groups such as ITAC, and we will also make special efforts to gather input from those individuals with less expertise in IT. Faculty and students have different motivations for using IT and move at different paces as they learn and experiment. To create the kind of campus-wide community that we envision, it will be necessary to draw everyone into this effort.

In addition to supporting the integration of information technology, we will strive to foster a climate for critical debate about the role of information technology in education and society at large. We already have a wide variety of information technologies in use across the University; this diversity provides an important opportunity for learning about the benefits and limitations of information technology. To formalize this effort, we will create **ISIS**, a certificate program in *Information Science and Information Studies*. The purpose of ISIS is to provide a forum for students and faculty to think deeply and critically about the role and function of information technology and to broaden our student’s understanding of the IT issues they will face in the actual work world.

The third element in our IT strategy is to support opportunities for entrepreneurship by our students and faculty. To do this, we are considering the creation of innovative new curriculum clusters on entrepreneurship and the digital economy that could serve as an area of concentration within the ISIS certificate and that could also be taken by non-ISIS students at the undergraduate and graduate levels. Additionally, we are looking at the possibility of creating a full-service, early-stage business incubator that pursues the commercial development of promising ideas, including those generated in the Duke community

As we organize the elements of CITIE and ISIS, we are exploring a range of options and opportunities for our students and faculty to facilitate the integration of information technology. In addition, we are augmenting our staff and facilities to support these initiatives. We are developing improved support for computation and other aspects of information technology in our research. We are working toward greater use of online learning across the campus. We are working to develop programs that are appropriate for Duke in distance education. We are creating new internal organizations to better manage and market our intellectual property. And we are working with outside organizations to support technology innovation.

Actions:

In support of these goals we will undertake the following actions:

- 1. Create a Campus Environment Where All Students and Faculty are Connected to the Resources They Need When and Where They Need Them.**
- 2. Provide Adequate Support to Students and Faculty in the Use of Information Technology.**
- 3. Incorporate Online Learning into Instructional Programs Whenever Appropriate.**
- 4. Support the Expansion of Distance Education in Appropriate Areas.**
- 5. Create a Technologically and Pedagogically Innovative Information Science and Information Studies Certificate Program (ISIS).**
- 6. Further Explore the Potential for Teaching, Training and Learning in the Areas of Information Technology and Entrepreneurship.**
- 7. Create a More Effective Organizational Structure for Information Technology Support.**

- 1. Create a Campus Environment Where All Students and Faculty Are Connected to the Resources They Need When and Where They Need Them.**

As a first step, by fall 2002, we will require all entering undergraduates to own a portable computer that meets Duke specifications and we will require all returning undergraduates to own a personal computer of some type also meeting basic specifications. By fall 2005, all undergraduates will have a portable computer that meets Duke specifications. We recognize that the pace of change in technology hardware and software may require flexibility in the specific ways this requirement becomes defined over time. In addition, with input from deans, faculty and students, we may choose to require different devices based on learning and communication needs. We will work with the graduate and professional schools to ensure that all students have a computer and/or computing devices appropriate to the program requirements of those schools and units. Additionally, we will pilot wireless network access in selected classrooms and commons areas to allow students to make more effective use of their machines.

The University will facilitate the purchase of both hardware and software, so that all students will have the appropriate capabilities. This will allow faculty to develop course software with full confidence that their students will be properly equipped to use it. By providing extensive access to information, communication, and learning tools, we believe that we can enhance student learning opportunities and that faculty will find new and innovative ways to teach and to conduct research.

Our objective here is to ensure that all students and faculty have the same capabilities. Among these we include the ability to effectively use e-mail and the web, word-processors, spreadsheets and databases. We will provide technology frameworks

and support that make it easy for faculty to integrate web pages, online curriculum and discussions, testing, and e-mail lists into their teaching efforts. These capabilities must be carefully incorporated into the curriculum. This training will be tied to pedagogy, not just to the “nuts and bolts” of IT, and it will respect the fact that the use of information technology is highly discipline-specific, not “one-size-fits all.” We will assess the outcomes of our efforts to ensure that we are having a positive impact. In order to create these capabilities, over the next year we will involve a wide-range of faculty and students in the discussion to clarify the appropriate hardware and software tools we will employ.

Duke has been recognized as a national leader in providing excellent networking in the past few years. However, new opportunities are emerging for providing mobile and flexible access through the selective use of *wireless* networking. We will develop and implement a plan for piloting wireless networking where it will provide the greatest benefit for our students and faculty. Our ultimate goal is to allow students and faculty to have full access to their educational materials in all of the environments where they work and interact with one another.

## **2. Provide Adequate Support to Students and Faculty in the Use of Information Technology.**

As we move to wider use of information technology in teaching and learning, we recognize the need to improve the information technology skills of both students and faculty. Starting in the summer of 2001, Duke will assess incoming undergraduate students’ information technology skill-sets and offer opportunities for students to gain the skills they need. With input from the faculty, the Center for Instructional Technology (CIT) and the Office of Information Technology (OIT), the office of the Dean of Arts and Sciences will regularly identify the required IT skills needed by students and lead the skills assessment efforts. Duke will employ a training coordinator and arrange for students to receive web-based, hands-on, and extended computer lab assistance to bring them up to the desired skill level. CIT will work with faculty and others to help identify emerging training needs and to pilot some of those new training efforts. CIT will assist faculty and departments in the delivery of training with a less-than-institutional scope. When it is determined that a new training skill for students is needed, it will be added to the assessment and training curriculum. These opportunities will be carefully coordinated with the programs that individual students will follow, rather than being a one-size-fits-all program.

We are developing a set of strategies to provide tools that simplify student and faculty use of information technology in high interest areas and promote the integration of research into teaching. We will ensure that these tools are widely available, easy to use, and highly reliable. We are also creating University guidelines concerning fair use and intellectual property and plan to identify a single office for consultations regarding copyright questions. This office will be located in Perkins Library and will be closely associated with the Center for Instructional Technology so that as new technology emerges, the policy and support issues can be rapidly addressed.

Students and faculty will also be provided with ongoing opportunities to learn what is possible with new teaching and learning technologies in order to allow them to take advantage of the latest information technology advancements. We will develop an information technology infrastructure plan to support academic technology as well as a plan for instructional technology assessment. In support of research, we are developing a strategy to support parallel computing, data storage and visualization.

To facilitate students' access to information, we will create a student web portal. This is a web site that offers a broad array of resources and services tailored to a particular audience; a portal presents a personalized view that can be tailored by the individual to present his or her preferred perspective of the university. This web portal will support the educational and campus needs of all Duke students. Since the Duke web site shapes the way we are perceived by much of the world, we will regularly review how easy it is for prospective students to find information about Duke that they consider relevant to their decision to apply.

Duke has traditionally relied on departmental support staff to provide first-line technical support for faculty. This model needs to be strengthened institutionally, especially if faculty are to respond to additional information technology expectations. We are creating guidelines and training on best-practice research and teaching tools to help departmental and central university support staff provide better service to faculty who are not knowledgeable in information technology. By having access to trained departmental support staff who are closely aligned with central University support groups, faculty will be able to carry out their research and teaching activities more effectively.

To assist faculty in instructional efforts, we will increase the number of academic technology assistants to provide faculty support with contextual understanding of given disciplines, and reshape and equip teaching spaces to support the use of new technologies. We will continue, through the Center for Instructional Technology, to provide ongoing opportunities for faculty to learn what is possible with new teaching and learning technologies and to provide staffing and funding to support instructional technology projects that have significant impact. We will identify information technology leaders among the faculty in every department and provide special support to their efforts in order to create models for other faculty members.

To assist faculty in research efforts, we will create and support models to enable high performance and other computing. Support for high performance computing (HPC) will focus on shared mass storage, super computing, and visualization efforts. Additionally, we recognize that computational challenges provide an excellent avenue to draw faculty and student expertise together to solve problems. Finally, we will continue to support the decentralized research support model, but will increase resources where needed for all research computing.

### **3. Incorporate Online Learning into Instructional Programs Where Appropriate.**

Online learning is the incorporation of information technology into teaching and learning for students at the University. While not a substitute for the face-to-face educational experience that is the hallmark of the Duke undergraduate experience, it is an important part of keeping our educational environment up to date. The incorporation of online tools in our course offerings can facilitate faculty-student interaction; enable additional learning opportunities; allow students to keep up with their full training program while spending periods away from campus; and enhance students' baseline computing skills. To accomplish this goal, we will enable all courses at Duke to provide a web-accessible curriculum, class materials, and online forums. A baseline amount of web-presence for each course will be automatically generated. Faculty can then take advantage of more advanced online course services if they feel it is appropriate.

Duke has over 300 courses available on a pilot CourseInfo Blackboard courseware system. This courseware allows faculty to use relatively simple tools to create course web site with course information, announcements, materials, schedules, assignments, online discussions, and other resources. We will upgrade this system and make it capable of supporting the whole institution. We will also provide training opportunities for faculty on a regular basis.

### **4. Support the Expansion of Distance Education in Appropriate Areas.**

Another action step is to establish Duke as a provider of distance education in those areas where it is appropriate. This includes the development and marketing of online courses in graduate or professional schools, courses for alumni, and continuing education courses. For example, the Fuqua School of Business and the School of Nursing currently provide computer-based learning to students on campus and around the world. There is a growing demand for evening and weekend educational opportunities for professionals employed in the Research Triangle Park and beyond. Duke does not wish to provide an undergraduate degree through the use of distance education courses.

We will evaluate the possibility of utilizing distance education courses developed by the University of North Carolina-Chapel Hill and North Carolina State University in our own curricula. Sharing a specialized or rare course could enhance the value of our students' experience.

Other activities we will undertake in support of distance education include:

- Supporting schools and faculty in identifying resources to help develop courses online;
- Developing agreements with outside firms to provide course development assistance and marketing support where appropriate;

- Providing guidelines concerning the ownership of intellectual property so that faculty are rewarded for their efforts and schools see their investment in support and information technology rewarded.

## **5. Create an Innovative Information Science and Information Studies Certificate Program.**

A Taskforce on Information Science and Information Studies was convened in the spring to look at several areas: curriculum; research; incubator ideas; and information technology support. The first agenda item has led to a proposal for a certificate program called **ISIS**. The purpose of ISIS will be to think deeply and critically about the role and function of "new technologies." A secondary purpose will be to fill the gap between current academic training (whether in business or computer science) and the needs of an actual work world that requires a wider understanding of commercial, legal, social, philosophical, computational, and aesthetic issues surrounding new technologies. ISIS will not be put forward as a new major, but instead will be an intellectually adventurous supplement to a traditional major or graduate degree program. It will draw upon expertise from many different areas of the university to create a new kind of collaborative learning community that parallels the interactions that students will encounter in their future work lives. It will also include an extracurricular "skills" component, a community-serving component, internships, and a capstone experience. For the capstone experience, students will work in teams to write a new instructional unit for future ISIS students, create new software, form a company, or invent new devices and support these creations with a business, environmental, or social impact plan. Finally, ISIS will use a range of new information technologies to explore alternative pedagogical models, with an aim towards fostering collaborations among Duke students (undergraduates, graduate, and professional students) in a range of fields as well as with industry and community partners.

Students will begin with a survey course that covers major issues in information studies that spans everything from computer-generated music to writing code to computational science to science studies to graphic design. Social issues (i.e. the Digital Divide) and legal issues (security, privacy, and intellectual property) will also be discussed. Faculty from across the university will lecture in this required course, which will end with advanced students presenting their final projects to the entering students. For the next phase of the program, students take three courses in an "area of concentration" that is different and complementary to their major.

ISIS also includes a number of components that actually utilize new technologies to explore new models of pedagogy. They work in virtual "teams" that bring together undergraduates with graduate and professional students with different areas of expertise, intellectual preparation, and skills. Partnerships with industry, alumni/ae, and high schools in the greater Durham community will all enhance the standard mixture of lecture classes, seminar classes, and labs. A capstone requires teams of four or five students with different expertise to create something (anything from a new unit for the course to be

archived with the program to new software or hardware to a new e-business). Along with the entity itself, the team of students will collaborate on a full report on this entity that includes discussion of the social, political, ethical, aesthetic, business, legal, engineering, or science goals, limits, or purposes. This work will be presented to students in the introductory course.

This is not a program to create technocrats. Rather, it is conceived as an intellectually adventurous, expansive, and experimental supplement to a traditional major or graduate degree program. We do not intend to establish ISIS as a major in and of itself but instead to use expertise from many different areas of the university—from art to zoology—to create a new kind of collaborative learning community that approximates the collaborations students will encounter in their future work lives.

Other goals for ISIS include:

- Helping with the Digital Divide in the Local Durham Community Through a Community-Serving Requirement.
- Establishing Internships in Industry, Government, and Non-Profit Agencies and Allow “virtual” Internships and Distance Collaborations That Spring From Those Internships.
- Creating a Capstone Experience which Requires Students to Rely on One Another’s Different Intellectual Expertise and Skills.

## **6. Further Explore the Potential for Teaching, Training, and Learning in the Areas of Information Technology and Entrepreneurship.**

We are considering how best to support teaching, training, and learning in entrepreneurship, especially in the area of information technology. One possibility is the creation of innovative new curriculum clusters on entrepreneurship and the digital economy that could serve as an area of concentration within the ISIS certificate and that could also be taken by non-ISIS students at the undergraduate and graduate levels. Another would be to create a nearly-stage business incubator that pursues the commercial development of promising ideas, including those generated in the Duke community. This incubator might include 10-12 start-up companies and would function both as a research laboratory and a learning environment for students, as well as a for-profit business accelerator for start-up companies from Duke.

## **7. Create a More Effective Organizational Structure for Information Technology Support.**

In September 2000, the Provost appointed a Special Assistant to the Provost on Academic Technology. This individual acts as an academic information technology champion, coordinator, and facilitator for the planning process. He will develop a detailed plan that builds on this document and addresses instructional and research

technology across Duke. Other enhancements to our organizational structure include creating central consulting resources to guide and assist faculty in the use of academic technology. We will also establish a facilitated executive roundtable to garner external guidance in the use of information technology.

#### Assessment for Goal 6

To monitor our progress towards Goal 6, we will:

- Create benchmarks and a full assessment procedure for CITIE. This will be a major element of the implementation procedure for CITIE that will be worked out in the months before its begins in fall 2002.
- Create benchmarks for ISIS that include student and faculty interest, student satisfaction, national attention and rankings, placement of ISIS students in careers, and usefulness of ISIS as a tool for recruiting students to Duke. We will build a five-year sunset clause into the program, and allow its renewal only if it is serving its constituency with innovation, encouraging excellence, and modeling intellectual entrepreneurship.

## **Goal 7: Nurture the Personal and Intellectual Growth of Students by Building Community in Social, Civic, and Academic Realms.**

We seek to create an environment for students at Duke University that attends to the whole person and fosters development across many dimensions. Our students, on both the undergraduate and graduate levels, consider Duke for many reasons, but it is the totality of what they conceive to be “the Duke experience” that ultimately attracts them. Elements of that experience can be as tangible and obvious as a specific teacher-researcher in a given field, a tent in Krzyzewskiville, or a towering magnolia on the quad. They can also be more subtle: the traditions and values of the institution that play themselves out in the ways in which the University structures its curricula, for example, or encourages faculty-student interaction, promotes student input, creates a welcoming environment for all, and enables learning from diversity. We have an obligation to do more than provide (and tout) Duke’s excellent faculty, facilities, and programs; we must simultaneously maximize the benefits from faculty, facilities, and programs that accrue to our students, in order to make sure that upon graduation these students are more fully developed as human beings than when they matriculated.

Duke provides an attractive setting in which to live, study, and recreate, in ways both literal and figurative. Perhaps most engagingly, Duke has retained a youthful spirit that manifests itself not only in the enthusiasm for camping out before basketball games but, more importantly, in the active role that undergraduate and graduate/professional students play in working for change at the institution and beyond—our student version of the high priority we place on faculty governance, and a true hallmark of the Duke experience. We have listened to our students in assessing how we might best build on our rich traditions to create a future even more conducive to the nurturing of all our students, whatever their background and age.

As we look to the future of student life at Duke, we would do well to reaffirm certain priorities:

- Student voice in the entire life of the University, and students’ ability to effect change;
- Active, energizing engagement in academics, and also in the arts, sports, government, and other activities that nourish the whole person;
- Other-directedness informed by knowledge of, and concern for, others at home and abroad;
- Embracing of diversity, respect for differences, management of conflict.

Our planning for the next five-ten years includes as a critical piece a more comprehensive, holistic approach to student life at Duke University, one that builds on the traditions that make Duke a distinctive university and creates bridges between all aspects of campus life. Our Plan as a whole calls for increased intellectual collaborations. So too it must call for increased community building in student life: enhanced interactions with those with whom our students study and recreate (horizontal integration) as well as with faculty and students less or more advanced (vertical

integration); and enhanced interactions with the local community, its agencies, institutions, and issues.

The nurturing of personal and intellectual growth through the creation of a true learning community rests on three poles: recruitment of an intellectually engaged and multi-dimensional student body; reduction of barriers to interaction among diverse populations; and attention to the personal well-being of every student and a healthy, safe learning environment.

Actions:

- 1. Create a Hospitable Environment for Our Diverse Students and Enable Learning from Diversity.**
- 2. Resolve Space Issues Affecting the Co-Curricular Lives of Students.**
- 3. Maintain Our Historic Valuation of the Spiritual and Ethical Dimensions of Student Life.**
- 4. Promote the Physical and Mental Well Being of our Students.**
- 5. Look For New Ways to Integrate the Campus and the City and Foster Community Service.**
- 6. Take Steps to Encourage Interaction Between Students and Faculty.**
- 7. Bridge the Generational Divide Between Undergraduates and Graduate Students.**
- 8. Set High Expectations for Learning Outside the Classroom.**
- 9. Reduce the Dichotomy Between Curricular and Co-Curricular Activities.**
- 10. Better Coordinate the Divisions of Academic and Student Affairs.**
- 11. Recruit the Best Undergraduate Students to Duke.**
- 12. Give Special Attention to the Concerns of Our Graduate and Professional Students.**

The new Vice President for Student Affairs is a critical player in the achievement of a vision for true community at Duke, who will amend, develop, and implement these plans in tandem with students, faculty, and other administrators.

**1. Create a Hospitable Environment for our Diverse Students and Enable Learning from Diversity.**

Duke University is happily a much more heterogeneous place today than it was as recently as two decades ago. The discussion of diversity in the section on goal 5 details the reasons why diversity issues are important and sets as one benchmark the creation of a more comfortable working and learning environment for all members of our community. Without a hospitable environment, we are not living up to the implicit (and sometimes explicit) promises that we make to those who apply and matriculate. Certainly we are making steady progress on this front: for example, *Black Enterprise* magazine recently rated us 16<sup>th</sup> on the list of top colleges for African-American students, up from 20<sup>th</sup> two years ago. Although we have moved up in this rating, we cannot count

on a natural trajectory. This track requires continuous attention and a daily reaffirmation of our commitment to increasing the inclusivity of our campus.

Creating that hospitable environment, and hence a true learning community, will continue to take a multi-faceted approach toward classroom and co-curricular life alike. As an overarching principle we must continually and concretely affirm the value we place on the contributions made to the institution by our diverse students, whether they are part of socio-economic, racial, religious, national, or broadly defined cultural minorities. These students embody a unique opportunity for all members of our community to learn from difference: through diverse perspectives brought to bear on issues in the classroom, the various educational and cultural programs on the Martin Luther King, Jr. holiday, and such group-sponsored activities during the year as Diwali, Lunar New Year Celebration, or the Naturally Native Film Fest.

We must provide support services commensurate with the needs of our students, whether those students reside on campus, like most of our undergraduates, or are located halfway around the world, whether on study abroad or as part of Fuqua's international education programs. We must build on the first year campus experience for undergraduates, resolving residential and other space issues that have acted to dilute the impact of that early experience on the upperclass years. For our graduate students, we must provide the venues for interaction across disciplinary lines. Our course offerings themselves also provide diverse and global perspectives. The cross cultural inquiry requirement of Curriculum 2000 ensures that our Arts and Sciences undergraduates will benefit from these opportunities, as do our rich study abroad offerings of which so many students avail themselves; but we must attend as well to our faculty and library resources in areas of interest. Finally, classroom "climate" issues need to be continually addressed by faculty and deans, starting with orientation of new faculty to the university's expectations in this regard.

To encourage our students to learn from each other, we will:

- Monitor recruitment efforts to ensure that we are attracting a diverse group of applicants and matriculants.
- Publicly reaffirm and reinforce Duke University's commitment to diversity and to a welcoming campus for all its citizens.
- Make sure that our support services are adequate and well publicized to our students.
- Establish housing policies that work to equalize advantages, thus avoiding de facto segregation into different, narrowly defined communities based on economic or climate pressures.
- Provide adequate resources for programming on topics of diversity, including attention to the infrastructures of current and potential cultural centers and the Office of Intercultural Affairs.
- Cultivate mentorships through the Sam Cook Society and other venues.
- Continue to address curriculum issues related to multiculturalism, to ensure that the academic offerings of the University are adequately reflective of the student body and its intellectual interests.

## **2. Resolve Space Issues Affecting the Co-Curricular Lives of Our Students.**

It cannot be emphasized enough that the quality of student life *in general*, and thus the successful fostering of student development, depends in great part on the quality and accessibility of space. For both undergraduates and graduate students, space has been a prime concern for years. Limitation on the quantity and suitability of available socializing and meeting space has been a consequence of several developments around campus, including changes in Cameron Indoor Stadium; departmental control over rooms; allocation of commons rooms in residence halls. If we are to make the campus as appealing as possible to students, we must provide adequate space—for study, meetings, discussions, worship, parties, and games (even intramural programs in bridge or chess, darts or billiards); for large-scale public events and intimate conversations—and reduce the obstacles in scheduling it.

Attention to space—to its construction, renovation, and allocation across the board—is a high order of business at which we are already hard at work. Construction of the West-Edens Link in tandem with a phase out of the North Campus, a consideration of a sophomore housing requirement on West, and a re-evaluation of housing assignments will enhance the sense of community for undergraduates. At the same time, a newly formed Community Housing Office promises to provide information on appropriate housing in the community for our graduate and professional students. As discussed in Part Five, new space for student life is in the planning stages, most notably an additional floor in the Bryan Center and renovation in the West Union; and, as noted in Part Four, Perkins Library is undergoing renovation. The needs of graduate students as well as of undergraduates must be addressed as these spaces are designed and allocated.

To ensure a use of space on campus that will enhance community, we will:

- Monitor our policies and practices regarding space construction, renovation, allocation, and usage—residential, social, and programming space—to maximize accessibility and equity for all.

## **3. Maintain Our Historic Valuation of the Spiritual and Ethical Dimensions of Student Life.**

We need look no further than our own Duke University motto for one of the principles that inspire our planning for student life in its broadest sense: *Eruditio et Religio*. From its establishment in 1859, Trinity College was conceived as a religious institution, not in a narrowly defined way—such a way would not be consistent with the meaning or intent of its affiliation with the Methodist Church—but “broadly and nondenominationally,” to quote Professor Durden’s history of this institution. Its motto, which later became Duke University’s, shows by its use of the conjunction “and” that scholarship and religion go hand in hand. Duke would stand, in President Few’s words, for “a conception of religion as comprehending the whole of life and of education as

having to do with all the capacities of our human nature.”<sup>2</sup> Thus we consider the definition of “a religious institution” broad enough to encompass spirituality and ethical concerns as well, with an emphasis on the search for meaning in life and service to the highest ideals of behavior.

Our founders were wise indeed to emphasize the place of religion in the life of the university, an emphasis that the Duke Chapel’s central location and soaring spires make obvious. Over the years, as our student bodies, faculty, and employees all across the campus have become more diverse, religion has if anything played a more important role at Duke University. Duke is increasingly a place where people of diverse faith traditions can, without embarrassment or isolation, uphold their customs and practice their observances *and* also engage in academic and social pursuits. Muslim students praying several times a day during Ramadan, Hindu students meeting regularly to read from and interpret the Bhagavad Gita, Jewish students celebrating Shabbat in three simultaneous worship services—President Few might not have quite envisioned such events, but he no doubt would be pleased that religion is playing an integral role in the lives of Duke students.

At Duke, religious facilities, in addition to being particularistic spaces, are also University, public spaces—spaces in which all can seek and achieve spiritual and educational uplift. For example, when a FOCUS section meets for classes in the sanctuary of the Freeman Center for Jewish Life, followed by dinner in the kosher dining facility, something important is happening for Duke as a whole. When the community gathers in the Chapel for a service in commemoration of Martin Luther King, Jr., the power and majesty of the building itself lend dignity and stature to the event and inspire those in attendance to lofty thoughts.

Duke University should maintain its historic valuation of the place of religion, spirituality, and ethical reflection on a college campus. As our motto indicates, this valuation does not stand in contradiction to the life of the intellect, but rather complements that life. Indeed, our newly established program in integrative medicine within the Health System and the Divinity School makes clear Duke’s valuation of the whole person and the role of all aspects of human behavior and belief in illness and wellness. Religious activity and spiritual seeking, when incorporated into the mainstream of our campus rather than relegated to the fringes, reap public rewards—as when our Arab and Jewish students joined together in dialogue during the recent and continuing crisis in the Middle East—and private ones that are not so visible but no less real.

We must continue to monitor our academic and student affairs policies to ensure that all who wish to maintain religious practices, and lead a religious and spiritual life at Duke University, are able to do so. But more, we must continue to insist on the importance of integrity in academic and social realms as a critical component of community building and personal development; doing so will not only improve the environment at Duke but also strengthen habits of good citizenship for the years after graduation. The success of our goals for our students, as for every other Duke

<sup>2</sup> Robert E. Durden, *The Launching of Duke University, 1924-1949* (Durham: Duke U. Press, 1993), p. 205.

constituency, depends on setting high expectations for ethical behavior. Such behavior is grounded in respect for others, adherence to community standards, and acceptance of responsibility for both one's own actions and the welfare of the group. Undergraduates especially, on their own often for the first time, need assistance in learning to make appropriate choices, and we must foreground the university's responsibility for supporting such learning. The ethical inquiry requirement of Curriculum 2000, in tandem with the work of the Kenan Ethics Program, reinforces our institutional priority on integrity and good community citizenship and creates structures for enacting that priority. Ideally, each faculty member in every class, on all levels of study—as well as advisors, deans, and all others who come in contact with students—will highlight the importance of codes of honor and help students understand fully what constitutes breaches of these codes. Appropriate sanctions for such breaches must be developed.

To promote our students' spiritual seeking and ethical behavior, we will:

- Raise faculty and administrators' awareness of diverse religious practices.
- Monitor University policies as they affect students' religious practices.
- Provide suitable worship space for all religious groups.
- Set high standards for ethical conduct in and out of the classroom.
- Expect faculty to address issues of academic integrity with their classes.
- Review as a community our academic and social integrity policies and practices and make changes as indicated.

#### **4. Promote the Physical and Mental Well Being of Our Students.**

It goes without saying that a student who is suffering from a physical or emotional illness cannot learn as effectively as if he or she were well. It is painful to acknowledge that many of the nation's college students are *not* well. Some students carry problems to campus as they arrive for orientation; others get into difficulty once they are here. Over-consumption of alcohol is one of our most intractable undergraduate problems, leading to anti-social behavior ranging from dirtying of bathrooms to outright sexual assault, not to mention the trips to the Emergency Department. Drug abuse, eating disorders, and depression are also all too common on Duke's campus, as at other schools. Nationwide, the number of students with severe psychological problems is increasing.<sup>3</sup> All of these students are at risk in both the academic and co-curricular realms; we are working hard to address their problems and to determine best policies and practices for ameliorating the situation.

Students with physical and learning disabilities are also increasing in number, presenting special challenges to the institution to ensure that its faculty and facilities are hospitable. Navigating literal and figurative rough terrains is still a common occurrence

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<sup>3</sup> The Duke University Division of Student Affairs strategic plan FY'02-'06 notes that 79% of counseling centers responding to a national survey in 1999 indicated an increase in such cases. This plan also notes that the number of students presenting at CAPS with eating disorders rose from 4% of the total to 14% between 1998/99 and 1999/00.

for many of these students at Duke, though less so over recent years as we have enhanced our support services, educated our faculty and staff, and lessened the physical obstacles.

We must continue to promote good health habits and a safe environment on several fronts, including mounting an aggressive educational campaign about the dangers of substance abuse; maintaining a staff of well-trained psychological and disability counselors adequate to handle the number of clients; offering support groups; training the residential staff to spot and deal with health problems; providing nutritious eating options; and educating faculty and staff about the nature and impact of medical conditions and disabilities. By so doing, we attend to the growth and development of the whole person and help to ensure that all our students can get the most out of their Duke education. (See Part Four (Support Plan), for elaboration on this action step.)

To address the physical and mental health needs of our students, we will:

- Consolidate and relocate Student Health Services to a more easily accessible location.
- Monitor the level of service provided by our trained medical, psychological, and disability staffs and expand staffs as necessary to maintain quality.
- Hire a psychologist specially trained to deal with alcohol issues.
- Increase collaboration between Student Affairs and other areas of the University, including the Duke Health System and the athletics and recreation programs, to promote preventive health practices.

## **5. Look for New Ways to Integrate the Campus and the City and Foster Community Service.**

Considering that most of our undergraduate and graduate students are with us for a relatively short but formative portion of their lives, and that the campus (especially West) is to some degree a separate “island,” it is not surprising that many do not think of Durham as their home, and that some focus only on what they see as the city’s shortcomings. At the same time, it is gratifying that so many of our students consider themselves to be citizens of Durham and accept the obligations of citizenship. Duke University’s overall commitment to its surrounding community, as exemplified by the Duke-Durham Neighborhood Partnership Initiative (see Part Four, Support Plan), has been steadily increasing over the last decade. That commitment is very much manifested in the good work that large numbers of undergraduate and graduate students do in Durham; there are many examples of our students’ active engagement in collaborations with neighborhood residents in ways that enrich the lives of each and expanding the notion of community. Indeed, the aptly named Community Service Center is an important locus for this outreach, coordinating the placement of hundreds of students each year, mostly undergraduates, in a wide array of volunteer activities.

Service-based learning courses, too, are growing on the undergraduate level, extending the laboratory model from the sciences into the humanities and social sciences by devoting a several-hour segment of a course to experiential learning off campus and

linking it to research and study. The LEAPS program in the Kenan Institute trains peer leaders for the reflection segment of many such courses. On the graduate level, field education placements in the Divinity School, to use but one example, have created internships that are helping to improve the quality of life for families and children in neighboring Walltown.

It is possible that the growing opportunities for such service-based learning courses for academic credit will cap the potential for “pure” volunteer efforts through the Community Service Center and on an individual or group basis. Nonetheless, the high priority that Duke places on both kinds of community service for students is of a piece with our institutional commitment to Durham, and should be vigorously encouraged as an important part of the Duke education and an enhancement of student life. Our last strategic plan, *Shaping Our Future*, set as a goal the strengthening of community and citizenship, and articulated the need for Duke to “expand its concept of its role as a responsible citizen in the life of Durham.”<sup>4</sup> Through such programs as the Neighborhood Partnership Initiative, Duke has begun to transform its relationships with our community and put flesh on the bones of our rhetoric about a commitment to our host city. Student engagement in these programs has been critical to their success. We are committed to increasing our students’ participation in this outreach, recognizing that the habits of good citizenship and other-directedness that we help to build here in Durham will be carried forward by our graduates into their new communities. This expectation of socially responsible action is evolving naturally as a joint effort of faculty, students, and administrators.

To foster connections between the campus and the city, we will:

- Build on the success of community-university partnerships such as the Neighborhood Partnership Initiative.
- Highlight community involvement in communications geared toward prospective students.
- Encourage community service as part of the leadership aspect of some of our merit scholarships.
- Integrate research-based service learning into the curriculum.
- Recognize students for their good work in the community, in as many and various ways as possible.

## **6. Take Steps to Encourage Interaction Between Students and Faculty.**

The availability of faculty to students is a much-touted feature of the Duke education, and in most cases we deserve this recognition. Yet we need to be vigilant about ensuring that faculty are accessible and helpful to students both inside and outside the classroom, because faculty are the logical stimuli for our students’ intellectual curiosity and academic engagement, as well as being key components of the quality of

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<sup>4</sup> *Shaping Our Future: A Young University Faces a New Century* (September 1994), p. 39.

the educational experience. The teaching, advising, and mentoring roles of our faculty must thus continue to be foci of our attention. We continue to devise incentives for good teaching, including teaching awards and enhanced course evaluation forms.

Advising needs improvement, in our undergraduates' pre-major years as well as after their declaration of the major. We expect that the new student information system will prove a useful tool, because it allows up-to-the-minute access to student records and provides an advisement check sheet with more data than its predecessor. Such tools, of course, are most effectively employed by knowledgeable and concerned advisors.

Mentoring is also an important means of linking faculty and students, and we have taken steps to encourage such activity. The Premajor Center now supports about a dozen Dannenberg Mentorships per year, most of them involving students in faculty research and conferences, which sometimes lead to longer-term collaborations. The FOCUS program, serving approximately one-fifth of our first year students, provides a model of interdisciplinary team teaching and close association with students. The new Fitzpatrick Society in photonics, in the Pratt School of Engineering, promises to provide valuable faculty mentoring to advanced undergraduates. The Graduate School has recently established the Graduate Student Affairs Advisory Committee, composed of faculty and students; one of its first projects is investigating departmental practices in mentoring graduate students. Promoting mentorships is a responsibility of all academic arms of the institution, starting at the departmental level.

Given that faculty spend their teaching and advising hours on campus, have strong incentives to pursue their research, and are tugged by responsibilities and interests at home as well, we cannot expect them to extend their time on campus to any significant degree. The Faculty in Residence and Faculty Associates programs enhance somewhat the "after hours" faculty-student interaction on the undergraduate level. More natural points of connection between a larger number of students and faculty (and their families), however, could be provided through support for faculty entertainment of students linked to classes; more recreational activities and facilities open for use by all (at a competitive fee); reduced prices for faculty-student attendance at arts events (on the order of the faculty-student dining program); and faculty engagement in activities they feel passionate about, whether academic or cultural or religious or political, to which students are also committed. Identifying and enabling these natural points of interaction will be a joint effort of creative and persistent students, faculty, and administrators.

To encourage interaction between students and faculty, we will:

- Make expectations for good advising, teaching, and mentoring clear to faculty and clearly a part of teaching expectations influencing salary, promotion, and tenure.
- Publicize to both students and faculty the availability of such research fellowships as the Dannenberg Mentorships and the Undergraduate Research Support Program.
- Expand faculty-student interactions through the research requirements of Curriculum 2000.
- Develop senior capstone experiences.

- Seek to underwrite more expenses associated with entertaining students, recreating with students, and attending arts events with students.

## **7. Bridge the Generational Divide Between Undergraduates and Graduate Students.**

At present, graduate and professional students principally interact with undergraduates in the classroom as teaching assistants or instructors of the 20S series of courses in several departments, and outside of the classroom as resident advisors in the dormitories. Committee work and cultural centers provide additional opportunities for interaction. We can and should do even more to increase such connections. Our graduate students, closer in age to undergraduates, are in a better position than faculty to be seen as approachable; and, as our 1998 accreditation self-study put it, “they are likely to be more in touch with the language and events that figure prominently in undergraduates’ lives, which allows for the easier ‘translation’ of difficult concepts.”<sup>5</sup>

Graduate students are natural “bridge mentors,” then, to use the term devised by the biology department for its revamped introductory course a few years ago. We will take advantage of the new Arts and Sciences curriculum to enhance productive interchange between undergraduates and graduate students—the course requirements in research and in writing in the disciplines provide obvious mechanisms for creating the “vertical integration” discussed more fully under Goal 3, above.

Perhaps the most striking example of how Duke has bridged the generational divide is provided by the University Scholars Program, an interdisciplinary, intergenerational program. Here, older students mentor younger ones, professional students ask pointed questions of graduate students and vice versa, and students and faculty mix in seminars and in other environments. We need to extend this benefit to more of our students. The majors unions within the departments provide one venue for doing so, and the interdisciplinary discussion groups run by the “Unis,” the Franklin Center, and the Society of Duke Fellows are another locus for interaction.

To encourage connections between undergraduates and graduate students, we will:

- Utilize the revamping of individual courses to re-conceive the role of graduate students in undergraduate education.
- Use the research and writing course requirements of Curriculum 2000 to enhance “vertical integration.”
- Strengthen the departmental majors unions as venues for interaction between students at all levels.
- Include undergraduates in interdisciplinary discussion groups.

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<sup>5</sup> *Balancing the Roles of the Research University*, Philip Stewart, Chair of Self-Study, 1998

## **8. Set High Expectations for Learning Outside the Classroom.**

There is no question that education should be defined broadly and nurtured in a variety of venues embracing the totality of Duke's offerings for its undergraduates and graduate/professional students. We expect that our graduates will be leaders, and we provide many activities for honing the requisite skills, both inside the classroom and out. We must continue to monitor space and other resources to facilitate the fostering of interests, skills, and friendships in the co-curricular realm.

There is some question, however, about whether we are challenging our undergraduates daily in the classroom, pushing the limits of their capabilities. When we adopted a four-course semester as our standard undergraduate course load, replacing the expectation for five courses, we did so in the belief that it is better to delve deeply into a subject matter than to skim the surface. However, taking four courses, especially if they do not have labs and if they meet in the increasingly popular two-day-per-week time period, leaves a great deal of time open. Much of this time is utilized productively, as noted above, perhaps in community service, involvement in interest groups, or engagement in the simple pleasure of talking with friends. But our students and their parents deserve to have high expectations for the intellectual demands of Duke's curriculum. We must continue to monitor this situation and encourage the raising of faculty and student expectations for coursework. The institution of Curriculum 2000 for Trinity students, and the ongoing reevaluation of the engineering curriculum for Pratt undergraduates, hold promise for the renewed rigor of our students' educational experience.

Holding high expectations for out-of-class reading, writing, and problem solving, is but one approach to strengthening the academic education of our students. The FOCUS program and language dorms provide wonderful models for how we might better integrate learning and living at Duke University. Students housed by common intellectual interests "live" their subject matter and deepen their commitment and engagement. Add in the dining experience that is an integral part of FOCUS and we have a recipe for success. This first semester program eases the transition to college, instills an understanding of what a college education means, develops the skills for active, communal learning, and creates student expectations for their upper class years at Duke. We must seek to fulfill these expectations. As we continue to enrich the undergraduate curriculum with similar programs, including senior capstone experiences, we would do well to build residential or dining components into them. Nourishing the Duke version of "residential colleges" will be a partnership between academic and student affairs personnel.

To extend what goes on in the classroom to life outside of the classroom, we will:

- Using senior survey responses as a monitoring mechanism, urge faculty to assign coursework such that students are challenged by and benefit from appropriately demanding workloads and expectations.

- Using the new undergraduate course evaluations as a guide, expect faculty to match content with course descriptions and requirements.
- Make residence-hall-based intellectual theme groups available to all interested students.
- Develop the Perkins Library renovation plans with an eye toward making it an optimal environment for research, study, and discussion.

## **9. Reduce the Dichotomy Between Curricular and Co-Curricular Activities.**

For our undergraduates especially, we should make it a priority to lessen the dichotomy between what goes on in the classroom and what happens “after hours.” As already implied, much of our students’ free time—like that of faculty and staff—is profitably spent in pursuits other than the academic or intellectual. Everyone needs “down time,” after all. Nonetheless, there is no reason why more of our students can’t consider coffee and conversation after a lecture by a visiting scholar to be a relaxing way to spend an evening. Graduate and professional students naturally gravitate to such an activity; it is a challenge for faculty to motivate it on the undergraduate level as well. Faculty should be encouraged to involve their undergraduate students more in such events, not only as members of the audience but as active participants in planning and hosting.

Such interactions, in combination with the more structured opportunities afforded by service-based learning and field education, break down rigid and limiting demarcations between class time and play time. Active engagement in learning, where students make things happen, also fosters the important concept of continuous—i.e. lifelong—learning.

To foster connections between the curriculum and co-curricular activity, we will:

- Involve students in important committee work bearing on intellectual issues and academic policy.
- Encourage faculty to involve students on all levels in the planning of seminars and conferences.
- Encourage and facilitate service-based learning courses, linking a service component to research and academic study, where appropriate to faculty talent, student interest, and curricular need.

## **10. Better Coordinate the Divisions of Academic Affairs and Student Affairs.**

The student affairs and academic affairs divisions, for too long and by too many people, have been considered separate realms. In this model, curricular matters at all levels as well as the relationships between faculty and students have been seen as lying within the purview of the Provost and the academic deans. In contrast, Student Affairs has been viewed largely as an organization geared toward undergraduates (since the

Graduate and professional schools contain their own student affairs offices), in charge of facilitating a healthy, safe, and fun-filled environment and fostering what might be called life skills development. Some activities, like preparing students for their post-graduation careers, have traditionally crossed the boundaries between these divisions. But on the whole, with this model there is a fairly clear demarcation between the classroom and the co-curricular lives of students.

This model will no longer suffice. First of all, students' lives have never divided neatly between the academic and the "everyday." Financial problems, parental pressures, decisions about "coming out," roommate conflicts, over-drinking or under-eating—these issues have always bled into the classroom. Conversely, concerns with performance, worries about the next paper or test not to mention the major or career—these issues affect the personal life. Breaches of ethical standards occur in both the academic and social realms. International students, including more than a quarter of all our graduate students, struggle at times with language and culture adjustments, in class and out. In all cases, these matters are dealt with by academic and student affairs deans alike. Second, all members of the Duke community need to share responsibility for building within our students the habits and skills of leadership, personal decision making, problem solving, and conflict resolution—in short, for educating citizens and leaders. And third, the various boundary crossings discussed above rely on an infrastructure in which the relationship between academic and student affairs is more seamless than it is now.

Collegiality and frequent contact among administrators in both "camps" have kept the divide from widening unduly, but we would do well to re-evaluate the structures currently in place to ensure that strategic partnerships are easily formed and that Student Affairs has the resources and the clout to be an equal partner. The reporting relationships, organizational chart, and purview of the division should all come under especially close scrutiny as the new Vice President for Student Affairs comes on board.

To strengthen communication and collaboration between academic and student affairs, we will:

- Re-examine the mission and philosophies, and then the roles and responsibilities, of the student affairs and academic deans.
- Increase Student Affairs representation on the Undergraduate Administrators Group.

## **11. Recruit the Very Best Undergraduate Students to Duke.**

Over the last decade, Duke has made improvements in several indicators of quality in its undergraduate population: improved SAT scores, more success in competing for students with the country's most prestigious universities, better yield of the strongest students, and more racial and ethnic diversity. However, we have not been as successful as we would like in attracting the very best quality students to either our applicant pools or our matriculating classes. Having gifted and diverse undergraduates is important for shaping the character of the campus, enhancing the educational experience

for all students, forming lifelong relationships and influencing the future, and attracting the best faculty and graduate students. Thus, increasing our share of the most highly-competitive students, in terms of number of applications and yield on admitted applicants, is an important target for the coming years.

The preceding sections of Goal 7 talk about raising the ambitions and expectations of our undergraduates once they are at Duke. We also wish to get more intellectually engaged and diverse students here to begin with. These are twin initiatives, to be attended to simultaneously. The report entitled “Undergraduate Admissions and Financial Aid: Planning for the Next Decade,” which complements this Plan, suggests ways to enhance our recruiting efforts in order to increase intellectual engagement and socio-economic diversity; as well, it proposes initiatives for improving the quality of campus life for students on financial aid.

To enhance our recruiting efforts, and improve the quality of life for students at Duke, we will:

- Mount a more aggressive recruiting campaign through such steps as additional travel and targeted schools.
- Offer financial aid to international applicants.
- Make improvements to our current financial aid packages for undergraduates.
- Undertake additional measures to further improve the quality and diversity of our student bodies.

## **12. Give Special Attention to the Concerns of Our Graduate and Professional Students.**

Although Duke’s graduate and professional students are by and large more mature, more focused, and more self-sufficient than undergraduates, they are also less cohesive and more isolated. Some of their issues and concerns are reminiscent of those held by undergraduates, while others are uniquely their own—and all merit attention. In November of 1999, the Graduate and Professional School Council (GPSC) issued a report highlighting five major un-addressed needs that detract from the quality of life for graduate and professional students at Duke University. These are:

- Safe, affordable, and convenient housing
- A specific social space
- Better academic facilities for teaching and research
- Improved transportation accommodations, including close-in parking
- Affordable, accessible, high quality child care.

A task force formed to study these concerns surveyed the larger student body, developed some short term solutions to identified problems, and proposed longer term approaches.

As a result of this task force work, in tandem with efforts of the other units charged with student affairs<sup>6</sup> or having impact on student life, building community among our graduate and professional students is being tackled by improvements in physical space and cyberspace. These include some free uses of the Devil's Den for large-scale social events, space in the Law School for GPSC-sponsored interdisciplinary discussion groups, a student life web site for communicating with the entire body of graduate and professional students. The Graduate School is supporting the new Community Housing Office, described above, which addresses the need for housing information, while a student-operated child care cooperative and reserved student slots at the Duke-Bright Horizons Center have been proposed as options for addressing the need for daycare. Some of these solutions are viable for the long-term, but other proposals must be addressed by additional bodies if we are to find lasting means of improving the quality of life for our graduate and professional students. Such as-yet-unaddressed issues as parking and social space are university-wide issues and demand a broad perspective.

Support for graduate and professional students alike also includes professional development: mentoring (noted earlier), conference attendance, up-to-date information about job opportunities, and assistance with placement. Increased collaboration among the Career Center, Counseling and Psychological Services, International House, Institutional Equity, and any other campus support services geared toward students, will help graduate and professional students access these services and potentially enhance their progress toward the degree.

Policies related to the professional students are detailed in each of the professional school plans. As for graduate students, the Graduate School plan for its student body that was put forth in 1994 is now playing itself out: numbers have been selectively downsized and stipends increased. At the same time, Duke has experienced some decline in applications to humanities and social science degree programs, and from minorities overall. Additional support for the doctoral students is still a concern. As detailed in the Graduate School planning document, principal goals are to strengthen our applicant pools in areas where we are not performing as well as our peers; to increase our minority applications overall; and to secure broader financial support for research. Then, too, more creative uses of graduate students in the classroom—as suggested in earlier pages—can help us deliver on our promises to undergraduates while at the same time providing graduate students with the training in teaching that most of them need for landing and succeeding in future positions.

Finally, the development of master's programs for niche markets can provide a service to those constituencies while at the same time providing resources for our doctoral students. And joint degree programs between professional schools, and between the professional schools and the Graduate School, could well be expanded: For example,

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<sup>6</sup> These include the Graduate School's Office of Graduate Student Affairs; the Graduate Student Affairs Advisory Committee, referenced earlier; an informal Graduate and Professional Student Affairs network; and the Council of Graduate and Professional Student Affairs, an arm of Duke's central division of student affairs.

there is interest in the medical school in having a larger number of its students pursue an additional academic degree. There are possibilities for a JD/MD, MD/M Div., or an MD with a master's degree in a humanities or social science department.

To enhance the quality of life for our graduate and professional students, we will:

- Continue to foster collaboration among students and student affairs personnel in the focus on concerns of graduate and professional students.
- Monitor the progress on the most pressing concerns identified by the GPSC report and the task force survey.
- Utilize the new web site for informing graduate and professional students of programs and events.
- Refer the investigation of the development of a cooperative childcare arrangement to a committee formed for this purpose.
- Consider graduate/professional student space needs in the Bryan Center renovation.
- Assess departmentally the space provided for students' academic use.
- Review electronic network connections available to graduate and professional students.
- Consider graduate/professional student parking needs, and other transportational needs, in any review of transportational issues university-wide.

### **Conclusion: Student Life at Duke University**

At more than 11,000 strong, our students are a large and central constituency. Their quality at entrance and exit, and the quality of their entire educational experience at this university, speak for and reflect on the character of our institution as a whole. Although different students have different needs and expectations when they embark upon the Duke degree, all have the right to trust that we will attend to their development as students and human beings while they are with us. Living up to that trust is an educational, ethical, and economic imperative.

### **Assessment for Goal 7**

To monitor our progress towards Goal 7, we will:

- Track overall application and matriculation numbers, by category, as well as selectivity and yield indices.
- Regularly assess the utilization and effectiveness of all our support services.
- Continue to examine equity and accessibility aspects of our policies and practices regarding space construction, renovation, allocation, and usage.
- Utilize COFHE and other survey results to track student opinion on various aspects of undergraduate life, attending to responses by gender and race/ethnicity.

- Keep an eye on University policies as they affect students' religious practices.
- Review as a community our academic and social integrity policies and practices and continue to track judicial actions as well as student and faculty attitudes on integrity issues.
- Measure our success in making expectations for good advising, teaching, and mentoring a part of teaching expectations influencing salary, promotion, and tenure.
- Utilize the new undergraduate course evaluation form to provide comparative data.
- Track the number and success of senior capstone experiences.
- Track our success in creating programs of vertical integration.
- Develop mechanisms for assessing learning environments outside the classroom.
- Continue regular evaluation of our admissions process and practices, from recruitment through selection.
- Check the progress on the most pressing concerns identified by the GPSC report and the task force survey.

## **Goal 8: Extend Our Global Reach and Influence**

In the new international environment of the post-cold war world, those who want to survive and thrive need to understand that they are no longer merely citizens of nation states, but members of an interdependent world where nations are no longer masters of their own fate and individuals are part of an increasingly global community. The implications of these changes for institutions like Duke that are responsible for education is that students need greater interaction with different peoples and cultures. Knowledge of different cultures and languages is critical to their development as human beings, to their professional lives, and to their capacities to fulfill their responsibilities not just as citizens of the countries where they were born, but as members of an increasingly global community.

Our responsibility at Duke is to furnish our students with the resources to meet the challenges of an increasingly interdependent world where knowledge knows no boundaries and in which, as Duke graduates, they will have great responsibility for how the future is shaped. Accordingly, there are ongoing efforts to infuse the Duke curriculum with international content (one of the goals of Curriculum 2000); to increase the number of international students in the student body (approximately 5% of the undergraduate population now comes from foreign countries); and to expand opportunities for study abroad (currently, 46% of Duke undergraduates have a study abroad experience). It is through the window of international exchanges, built on the acquisition of languages and the experiences gained abroad, that students can compare themselves with others, examine the extent to which they are culture-bound, and explore the insights of those from other cultures who see the world through different lenses. Such insights can help them recognize that who they are and the context within which they live in the United States, while a product in part of the world they know, is as much a product of our interdependence with other regions and cultures about which they know almost nothing. This recognition is an important prerequisite to accepting membership in and responsibility for citizenship in the global community.

Faculty scholarship in the international arena is promoted through a series of international initiatives and seven area studies centers (five of which are National Resource Centers) which, in turn, inject cutting-edge scholarship into teaching and afford opportunities for students to engage in inquiry-based learning about cultures and international political and economic issues. Cutting across area studies, Duke's Oceans Connect Project, funded by the Ford Foundation's Crossing Borders Initiative, examines alternative ways of configuring world regions. Providing a basin-centered as opposed to a continental focus, Oceans Connect has proved a useful supplement to traditional ways of looking at international relations. It has resulted not only in exciting new faculty research and discussion throughout the university, but also in innovative courses that are built around connections between continents as opposed to comparisons between them or differences that divide them.

Extending Duke's global reach and influence is a critical priority because Duke's relatively short history and its relatively recent emergence as a comprehensive,

international university mean that it has a smaller alumni pool abroad and a greater challenge in projecting itself abroad than universities with which it is compared in the United States. To some extent, this challenge is being addressed by President Keohane's decision to embark on a series of international visits; by the Office of Development's efforts to energize Duke alumni abroad; by the Office of Admission's effort to increase the number of foreign undergraduate students at Duke; and, for the first time, by several initiatives to provide financial aid to foreign students. These latter initiatives will be critical in making us more competitive with our peers, allowing us to recruit some of the best foreign students and making it possible to have a more economically diverse population of foreign students.

We believe that more than anything we do, providing financial aid for foreign students will have a profound effect on Duke's visibility abroad, making people much more aware of Duke's national (and increasingly international) reputation. Finally, the development of strategic partnerships with other international universities by various departments in Arts and Sciences, as well as by Duke's professional schools, has the potential to extend Duke's reach and influence worldwide. While Duke has over 200 agreements with international universities, there are several that deserve special mention. The Law School currently has partnerships with the Institute of Transnational Law in Geneva and the Asia-American Institute in Transnational Law in Hong Kong. The Fuqua School of Business, in addition to the Global Executive MBA, has established the Fuqua School of Business Europe in Frankfurt, Germany. The Pratt School of Engineering is examining a partnership with Nanyang Technical University and Singapore General Hospital in Singapore. Duke's Clinical Research Institute (DCRI) in the Medical Center collaborates with academic groups in Canada, Belgium, the United Kingdom, Australia, Argentina, and New Zealand through the Virtual Coordinating Center for Global Collaborative Cardiovascular Research (VIGOUR). Future relationships will include academic centers in Chile, Scandinavia, Singapore, and China. Arts and Sciences, along with others, is developing a consortium arrangement with Venice International University and other universities in Europe (Barcelona and Munich) and the Middle East (Tel Aviv).

### Actions

Specific steps to consolidate internationalization initiatives at Duke and extend Duke's global reach abroad are discussed in greater detail in the Report of the International Affairs Committee, dated March 29, 2000. This report resulted from a yearlong review by the International Affairs Committee chaired by the Vice Provost for International Affairs, whose office will be responsible for implementing its recommendations. In summary, the report recommends that Duke:

- Develop partnerships that extend the university's international reach and integrate its faculty, students, and programs with their counterparts across the globe through programmatic initiatives that include faculty exchanges, student exchanges, field placements, international internships, and study abroad programs, all tied together through information technology;

- Find a mechanism for overcoming the obstacles that tuition and salary differentials pose for such exchanges;
- Eliminate barriers that inhibit financial aid recipients receiving grant aid from participating in study abroad programs;
- Budget need-based aid resources sufficient to enroll a diverse and competitive population of foreign students;
- Conduct a systematic review of the needs of international students at Duke and develop a plan to coordinate the servicing of those needs;
- Make a concerted effort to increase the number of foreign students admitted;
- Pursue opportunities that make it easier for science and engineering students to study abroad;
- Promote the continuing internationalization of the faculty through the support of international research networks;
- Increase the annual allocation to library collections and place a higher priority on collection development for the international area;
- Expand the infrastructure support for information technology to ensure that the university's internationalization initiatives are technologically capable;
- Promote, as a university priority, a fundraising campaign goal of \$20 million to replace and augment resources currently available for internationalization; and
- Oversee the implementation of these recommendations and provide the provost with an annual report about their status.

#### Assessment for Goal 8

To monitor our progress towards Goal 8, we will:

- Review the depth and breadth of major partnerships that are being developed with a view to prioritizing those partnerships that require greater investment;
- Assess the amount of financial aid available and projected for international students; compare it with that provided by our peers; and review the level of the endowments that will make such aid permanent, with a view to targeting additional resources that will enable us to match the efforts of our peers;

- Review the success we have had in overcoming the obstacles that tuition and salary differentials pose to exchanges, and decide whether or not we should consider a tuition equalization plan as one mechanism for doing so;
- Look carefully at the review committee's report (scheduled to be ready by Spring 2001) on the needs of international students and ensure that sufficient resources are available to address those problems that require support;
- Keep a careful tally of the international students that attend Duke and the countries from which they come, with a view to raising the number from 5% of the undergraduate body to 10% over the next decade;
- Assess the progress of our study abroad program under the new curriculum and promote more Duke students studying in non-English-speaking countries in the host countries' languages (although 67% of Duke students studying abroad do so in countries where the native language is not English, less than half of them study in the host countries' languages);
- Chart the number of science and engineering students studying abroad and continue to explore mechanisms for raising the number;
- Ensure that the infrastructure support (library, information technology) is adequately funded and that rising costs are factored into annual allocations;
- Keep careful track of the fundraising campaign's targets for internationalization and ensure that they are met.

## **Goal 9: Take a Leadership Role in Building Partnerships and Collaborations in the Research Triangle, the State, and Beyond.**

In an era characterized by rapid advances in science and use-inspired basic research, collaboration with external research institutions offers great advantages to each of us because of the obvious efficiencies of scale, the expanded reach of our programs and the increased impact of all that we do. Much of our institutional mission is shared with our sister institutions throughout the Research Triangle as well as the State of North Carolina, especially the role that we play in serving the better of our society. Duke, UNC-Chapel Hill, and North Carolina State are among the nation's top 50 institutions in research expenditures. North Carolina Central University is one of the nation's leading historically Black institutions. Faculty in every school at Duke are engaged in collaborations with scholars at one or more of these campuses. The strategic importance of Duke intensifying its efforts to establish partnerships with neighboring universities, as well as with industries and government agencies in the Research Triangle, is a priority in our long-range plan.

We have seen the benefits of collaborations such as the Triangle Universities Nuclear Laboratory or the Triangle Research Libraries Network, in both enhancing the scholarship and teaching of our faculty and in creating efficiencies from coordinated purchasing of relevant materials. Our arts, humanities, and social science programs have been strengthened enormously by partnerships with faculty and programs at UNC. The new Robertson Scholars program promises to create intensive linkages which will enrich the undergraduate educational experience for students at both UNC and Duke, and, at the same time, provide an infrastructure that should enhance the ability of faculty from these universities to work more effectively together. The Pratt School of Engineering, the Nicholas School of the Environment, and the School of Medicine expect to expand their linkages with NC State. The Center for Child and Family Policy has developed collaborative programs with both UNC and NCCU around the issues of early childhood development and juvenile violence. In addition, the multidisciplinary Institute for Care at the End of Life, housed in Duke's Divinity School, brings together faculty from Divinity, the Schools of Medicine and Nursing, NCCU, and the School of Social Work at UNC.

We must be more systematic in leveraging these kinds of inter-institutional partnerships as we implement our academic plan. Our president and the chancellors of UNC and NC State have increased their institutional commitments to working together. Regular meetings of the provosts of these institutions provide a framework for broadening discussions about inter-institutional partnerships for enhancing our teaching and research and expanding potential areas for additional collaborations.

The quality of life in this region is a strategic asset, and Duke should be a more active participant in public and private partnerships to address the region's challenges and opportunities, from transportation and solid waste to water quality and health care. All of the major employers in the region face challenges in recruiting and retaining a productive work force, and Duke should work closely with other major employers, the Chamber of Commerce, and other organizations to help address these challenges. We should

encourage our faculty and students who have expertise that can be brought to bear on regional problems to become engaged in their analysis and solution. In doing so, we need to recognize that appropriate incentives may have to be developed to support these efforts.

Finally, the strength and growth of the regional economy and its development should be a major asset for Duke. Similarly, Duke should be a major asset for the region's long term economic growth. The Research Triangle is well positioned for national and international leadership in biomedical research, electronics, pharmaceuticals, and clinically-related innovations. The presence of the Environmental Protection Agency and the National Institute of Environmental Health offers significant potential linkages in scientific policy and related environmental issues. Our medical center has established strong linkages to many of the nation's leading corporations and emerging high tech, biomedical companies in the Research Triangle; and, the Fuqua School of Business has a wide range of partnerships with Research Triangle corporations. Others at Duke, especially in the sciences and engineering, have opportunities to intensify collaborative relations with corporations in the Research Triangle. State funded institutions such as MCNC and the North Carolina Biotechnology Center are taking new steps to coordinate our efforts and to help us compete as a region, rather than individually.

As noted earlier, in the discussion of Goal 2, simulation and computation are increasingly critical to advances in scientific engineering and medical research. The new focus on use-inspired basic research, which characterizes fields like genomics, global change, and biological materials, is already evident at Duke, and is a centerpiece for the Pratt School of Engineering's plans for growth in bioengineering, photonics and communications, materials sciences and materials engineering. A significant new role is emerging for engineering as a transfer engine for scientific intellectual property. The Research Triangle is the home to several corporations that focus on these technologies, and should provide significant opportunities for collaborative partnerships that can strengthen the education and training missions at Duke. Additionally, these partnerships can provide a flow of trained scientists and engineers capable of supporting innovation and the work force needs of these corporations, and permit both the universities and the corporations to advance their research agendas and strengthen technology transfer. According to North Carolina Department of Commerce officials, some 15 percent of the electronics engineers in the entire country are now employed in North Carolina. The potential for collaborative partnerships in a field like photonics is striking, as is the unique potential that the Research Triangle and North Carolina have as a national and world center in these fast-growing areas of high technologies.

To take full advantage of this potential, Duke must improve internal coordination of our outreach efforts. In recent years, Duke University Medical Center has benefited from the aggressive technology transfer efforts coordinated through its Office of Science and Technology. We are assessing how we can make our current system of review and support for technology transfer with corporations more effective, including expanding the reach of the Office of Science and Technology to include the Pratt School and other schools at Duke. Our review will address how to maximize our potential institutional

advantages in forming partnerships with industry and other institutions in the Research Triangle. It will also assess how to improve support—including the development of incubator space—for faculty members and students with entrepreneurial ideas or discoveries who are interested in forming businesses to market their products. We need to better understand how we can leverage our close relations with leading venture capital companies and emerging companies in the region to Duke’s advantage and to the advantage of the region. Finally, we need to develop and use our expertise to provide training, innovation, and entrepreneurial opportunities for students in schools across the university.

It should also be noted that, in addition to collaborating with other regional institutions in specific programs of instruction and research, Duke is an active citizen of the higher education community broadly defined. Duke is a member of the leading higher education associations like the Association of American Universities and the Consortium on Financing Higher Education. Our officers, deans, and members of the professional staff frequently assume leadership roles in these organizations, keeping abreast of the major issues affecting higher education and helping to set the agenda for addressing them.

In summary, we now recognize more clearly than ever before that in many areas we cannot attain the excellence this plan so strongly advocates without improving the coordination of our efforts with our neighboring institutions and those outside the state. We commit ourselves to reducing, where possible, the obstacles to this collaboration and to taking a leadership role in forging new joint programs in North Carolina and beyond.

### Actions

In support of these goals, we will undertake the following actions:

- 1. Increase Collaborations with Triangle Universities and Throughout the State.**
- 2. Build on Our Partnerships with Government Agencies and Private Companies, Especially in Research Triangle Park.**
- 3. Support Partnerships that Strengthen the Durham Community.**
- 4. Look for New Opportunities to Collaborate in Both Education and Research Throughout the Nation.**

#### **1. Increase Collaborations with Triangle Universities and Throughout the State.**

##### a. Develop Joint Hiring Initiatives with Triangle Universities

There are numerous possibilities for joint hiring initiatives with our sister institutions in the Research Triangle. We can make coordinated appointments that complement rather than compete, especially when we reach the decision to build programs in new areas. We can make joint appointments, especially in areas where one

individual can offer instructional expertise to more than one campus. And the fact that there are a number of excellent institutions locally is a comparative advantage in hiring.

#### b. Develop Joint Degree and Non-Degree Programs with Triangle Universities

In a variety of areas there are opportunities for collaboration, either because individually we do not have the resources to duplicate each other's efforts, or simply because the programs would be significantly broader and stronger with joint efforts. Areas where we are working on collaborations include:

- **Less commonly taught languages**

Duke and UNC seek to avoid duplication and overlap on less commonly taught languages. Duke, for example, teaches Rumanian, Hungarian, and Turkish, while UNC does not. UNC, on the other hand, teaches Czech, Serbian, Croatian, and Bulgarian, while Duke does not. Our judgment is that more students would take courses in the other institution if transportation problems were solved. (See Robertson Scholars, below.)

- **Robertson Scholars**

The Robertson Scholars Program is a new, merit-based scholarship that will bring 15 students to Duke and 15 students to UNC each year. In addition to full tuition, room and living stipends at UNC or full tuition at Duke, Robertson Scholars will participate together in special seminars, summer enrichment activities, and cross campus exchange. A transportation infrastructure will facilitate inter-institutional exchange for these scholars and other members of the university communities.

- **Bioinformatics**

Graduate programs at Duke, UNC, and NC State are growing quickly and we are exploring cooperative aspects of the programs including a semester or more spent at another campus, summer coordinated programs, and internships for our students at another campus.

- **Marine Science & Policy**

Duke, UNC, and N.C. State all have marine laboratories in Carteret County, NC. We currently have a wide range of cooperative research projects and a limited number of shared course offerings. Another institution with a major marine science program and potential collaborator is UNC-Wilmington. Duke and UNC-Chapel Hill co-own the *Cape Hatteras*, a 131-foot oceanographic vessel. We would like to increase cooperative course offerings and opportunities for students to participate in research projects at the various facilities. We will continue discussions about the creation of a coastal institute, as well as our joint role in a larger, southeastern coastal effort being planned by the Oak Ridge Associated Universities (ORAU).

- **Shared Equipment**

Major instrumentation can be very expensive and is often underutilized by a particular research group. We will make efforts to coordinate the use of specialty equipment where possible.

- **International Area Studies**

At present, six of our seven area studies centers collaborate with all or some of their counterparts at UNC, NC State, and NCCU. In fact, without such collaboration, only one center at Duke and one at UNC would be able to stand on its own—all of the universities in the Triangle need the critical mass of collaborative efforts to be competitive in their bids to be named national resource centers. These collaborations bring in over \$2 million annually from the Federal Government, not to mention national recognition (only eight universities, including Duke and UNC, have five or more designated national resource centers). We should be able to get the Asian-Pacific Studies Institute (which just missed being designated a national resource center in the last round) and North American Studies (which had been a national resource center in the previous round) into the pool next time around and, eventually, African Studies.

- **The Franklin Center**

The John Hope Franklin Center for Interdisciplinary and International Studies is exploring collaborative relationships with NCCU and NC State on programs that range from those serving community leaders in Durham to Muslim networks, as well as a graduate certificate program in Global Studies. The seminars that take place in the Franklin Center will also collaborate with the National Humanities Center in RTP and the Institute for the Arts and Humanities at UNC. Finally, the video conference capacities of the Franklin Center will allow virtual collaborations around the globe. We are currently establishing partnerships as far afield as the University of Capetown.

c. Work to Remove Barriers to Cooperative Programs

Transportation is a major issue in developing joint programs in the Triangle. Prospects of a rail system hold high promise, especially for travel between Duke and NC State, while the bus system designed for the Robertson Scholars will facilitate travel between Duke and UNC. We must also work to deal with the burdens placed on students, faculty and staff by our non-overlapping semesters. This scheduling difficulty leads to problems with providing residence, transportation, food service and a variety of other services outside the normal time periods and strains our students to accommodate the course schedules of the other campuses as well as our own.

## **2. Build on Our Partnerships with Government Agencies and Private Companies.**

### a. Support Efforts by the School of Engineering to Serve as the Transfer Engine for Scientific Intellectual Property.

A major goal of the Pratt School of Engineering is to support a university wide culture for interdisciplinary research and serve as engine for translating breakthroughs in basic and applied sciences, engineering design, and medicine, into new products, processes, diagnostic techniques, and therapies that improve the human condition and the environment. Goal 3 of this plan puts forward our clear focus on interdisciplinary research and technology transfer. We will work aggressively to build partnerships with industry in the Research Triangle and beyond.

### b. Expand the Reach of the Office of Science and Technology

The Office of Science and Technology is responsible for licensing and start-up activity as well as for coordinating corporate gifts and corporate research collaborations. In Part Four of this plan we describe our plans for expanding the activities of this office, which has traditionally focused principally on the Medical School. Of particular growing interest are opportunities within Engineering.

### c. Support the North Carolina Genomics Consortium

In coordination with the North Carolina Biotechnology Center, Duke is a partner in the newly created North Carolina Genomics Consortium. This organization provides the mechanism to create a regional program of national visibility in genomic sciences. The Consortium is working to develop joint research proposals, facilitating the coordination of research efforts by North Carolina Universities and private companies, and helping to ensure the creation of educational programs that serve to prepare new kinds of scientists for a growing national need in biomedicine in the post genome-project era. The consortium is also provided a focus point for other biomedical activities such as a regional effort to become a national center of excellence in biomedical computing.

### d. Further Develop Our Working Relationship with MCNC in High Performance Computing and Networking

We are also working closely with the North Carolina Super Computing Center (NCSC) as we develop support for High Performance Computing on campus. NCSC recognizes the new challenges in such areas as bioinformatics and computational biology and is looking to play a major role in handling not only fast computations, but also mass storage, networking, parallel computing, and visualization.

The North Carolina Networking Initiative, a partnership between MCNC, UNC-Chapel Hill, North Carolina State University and Duke, is a pioneer in the creation of next-generation Internet technology as part of the Internet2 project. It is developing the infrastructure to give Research Triangle industries a competitive edge by pulling together

faculty from the three institutions who are developing advanced applications in networking and telecommunications.

e. Work Closely with Local Industry and the Durham Community in Developing Our Program in Information Science and Information Studies

ISIS (Information Science and Information Studies) is another program that has collaboration built into its instructional design, its pedagogical model, and its curricular and extracurricular offerings. In the third-year course of the program, we will invite industry and government partners to give ISIS students a chance to experiment with software, hardware, and other devices still in the developmental stage. The ISIS student teams will evaluate these materials and write business plans, environmental impact studies, or social impact studies and present these reports to the industry partners. Additionally, all ISIS students will be required to have an extracurricular community-service project that addresses the Digital Divide in our own community of Durham. This might include partnerships with area high school students; mentoring of young female students (to help overcome the gender gap in technology); or working with senior citizen communities to help seniors become linked to the outside world with email (something that has been shown to greatly decrease depression). We will also work on creating virtual linkages between current Duke students and alumni/ae, emphasizing that there might be exchange of the students' current knowledge of technology with the networking possibilities offered by Duke alumni/ae.

**3. Support Partnerships that Strengthen the Durham Community.**

We are continually striving to better coordinate our outreach and community affairs efforts across campus. The Duke-Durham Neighborhood Partnership Initiative, described more fully in Part Four of this plan, seeks to focus collaborative efforts to improve the quality of life of residents of neighborhoods near campus as well as the public schools that serve them.

In addition, Duke has a long history of developing programs with the North Carolina School of Science and Math. We are working on extending these efforts, especially in efforts by the school to provide research opportunities to its students. The North Carolina Museum of Life and Science is another important resource of the Durham community. We are making new efforts to partner with the museum, using their expertise in creating science exhibitions to provide an outlet for faculty who want to demonstrate to the public the excitement of their research.

**4. Look for New Opportunities to Collaborate in Both Education and Research Throughout the Nation.**

Duke is one of seven partners that co-manage, with UT-Battelle, The Oak Ridge National Laboratory. (The other partners are Florida State University, Georgia Institute

of Technology, North Carolina State University, Oak Ridge Associated Universities, The University of Virginia, and Virginia Polytechnic Institute and State University.) Through this partnership, new research capabilities will grow for our faculty through our access to the significant resources of a top-ranked national laboratory. In return, we will have the opportunity to contribute in directing the optimal use of those resources for scientific and engineering applications in areas of national importance.

Our faculty collaborate with other faculty at universities throughout the world, facilitated greatly by the growth of information technology. We are exploring the increased use of distance technologies to coordinate our education programs with a number of universities. Our new joint initiative in Photonics with Stanford University will provide an excellent opportunity to test these new technologies and should serve as a model as we build other partnerships that are on a grander scale than in the past.

#### Assessment of Goal 9

- We will monitor the number of our partnerships and collaborations as well as the increase in total university funding.
- We will measure the cost of collaborative efforts with other institutions against the cost of running the program independently to determine if we have increased efficiencies. We may be able to continue programs that could not be successful without a joint effort. Additionally, we will look to the possibility to cut back on the use of resources that duplicate efforts at our sister institutions. Where we can find these situations, we will be able to free our resources for other uses.

The principles, goals, action steps, and evaluation mechanisms detailed above, in this second part of the strategic plan, lead naturally to a statement of strategic initiatives. Part Three lays out the major initiatives that will bring the planning document to life and, in the process, take Duke University to the next level of excellence.

## PART THREE

### STRATEGIC INITIATIVES

Part Two of the Strategic Plan lays out in detail the principles and goals of our strategic plan, the steps that will be taken to implement them, and the benchmarks and modes of assessment that will be used to judge their success, adjust their direction, or dissemble them if they do not succeed sufficiently in furthering our goals. Yet, as should also be clear, the academic plan is built around a series of major (and additional minor) cross-departmental and cross-school intellectual initiatives that will shape Duke's intellectual profile; serve as cornerstones in the attainment of our goals; strongly influence our facilities planning; and play a central role in our efforts to move to the top of our peer institutions. In this section we outline each of those major initiatives.

In presenting these initiatives, we would want it clearly understood that they are the initiatives with a major span, crossing school boundaries and requiring central coordination and support. While each of the school plans outlines specific programs and priorities *at the school level*, it should also be underlined that these spanning initiatives are interactive with school planning. They are both shaped by, and shaping of, the undertakings of the schools. Furthermore, the financial support for these initiatives generally intersects closely with school priorities. This is particularly true in areas of facilities development (see Part Five), where neither many of the school initiatives nor those presented here could succeed without developing the space—through renovation, new construction, and reallocation—necessary to accommodate them and to attract the quality of faculty and students critical to their success. In alphabetical order, these spanning initiatives are:

- **Child Health and Policy;**
- **Environmental Solutions;**
- **John Hope Franklin Institute for Interdisciplinary Studies Research Initiatives;**
- **Genome Sciences;**
- **Global Change;**
- **Information Science and Information Studies;**
- **Improve the Integration of the Arts into the Academic Mission of the University**
- **Materials;**
- **Micro-Incentives Research Center;**
- **Neural Analysis and Engineering;**
- **Photonics and Communications;**
- **Science and Engineering Research Institute.**

#### **Child Health and Policy**

Two very strong programs on campus, the Center for Child and Family Policy and the Center for Health Policy, Law and Management, have come together and developed a joint vision for research development in Child and Health Policy. The goal of this

initiative is to build the capacity at Duke to help faculty conduct cutting-edge research and to have an impact on solutions to contemporary problems of relevance to children's well-being. This program will bridge basic scientific knowledge of human development and functioning with knowledge of the processes of public policy. It will have linkages to institutions outside of Duke that affect health and well-being, including public schools, hospitals and clinics, juvenile courts, child care centers, community centers, and government at all levels.

These two programs have come together both academically and administratively. Examples of substantive overlap are studies of child health, Medicaid policy, and other public programs addressing the comprehensive health needs of chronically ill children. Other overlaps include the kinds of data analyzed by members of the two centers as well as the kinds of personnel necessary to support the research of both.

The united program will be kicked off with four new initiatives:

- Schooling and Society;
- Culture of Violence;
- Working Families;
- Health in Mothers and Children of Minority Families.

In addition, the program will develop new international research and relationships.

### **Environmental Solutions**

In order to capitalize on our breadth and depth in environmental policy, law, social sciences, and related fields across the University, we will create a new Center for Environmental Solutions. The mission of this new Center will be to mobilize multidisciplinary thinking and institutional analysis to generate creative solutions for the most important and complex environmental challenges. Environmental issues are among the paramount challenges of the future, and, at the same time, they are topics on which Duke University can attain status as a world leader. Until now, there has been no organized mechanism to foster sustained collaborations across administrative boundaries. This new Center will be a network to connect faculty and students and to attract outside interest to Duke. In parallel with the new Center for Global Change, it will enable a new level of analysis of environmental problems not available on this scale before.

The Center will focus on institutions in order to address the systems, rules, organizations, and incentives that shape social interactions and environmental outcomes. This focus will build on Duke's strength in the study of government, social norms, decision making, policy design, and international regimes as they relate to environmental issues. A central theme will be the hypothesis that "institutions matter," based on the argument that a society's economic prosperity is determined not only by its natural resources, human resources, and technologies, but also by its institutions—its policies, structures, and incentives for organizing and shaping social activity. In this context, the

Center's research will address societal institutions of all kinds and on all scales, including governments, civil society, markets, industries, firms, and communities; different branches of government; different levels of institutional reach; different types of regulatory instruments; and comparisons across time, branches, levels, countries, cultures, and types of institutions.

While the Center's main emphasis will be on policy, law, and social sciences, it will involve significant participation by scholars in the physical and life sciences as well as in the humanities. The Center's aspirations to achieving solutions would stimulate constructive, forward-looking, non-partisan, problem-solving responses to environmental questions. These responses will include intellectual solutions to theoretical and empirical puzzles; policy solutions to specific regulatory and management problems; institutional solutions to the need for incentive-compatible structures that generate successful policies over time and space; and perhaps also technological and engineering solutions, depending on the external demand and internal faculty interest.

We believe that launching this Center will immediately distinguish Duke as a forward-thinking place at which to study environmental policy questions. Since no other center addresses environmental issues from a distinctly institutional perspective, this would be our hallmark.

### **John Hope Franklin Institute for Interdisciplinary Studies Research Initiatives**

As noted in earlier sections of this document, in order to improve the climate for interdisciplinary collaborative research within the humanities, and between the humanities and other areas of the University, we plan to initiate and develop a series of scholarly and pedagogical activities. These will be sponsored by the John Hope Franklin Institute for Interdisciplinary Studies, a humanities research unit that belongs to the consortium of programs designated as the John Hope Franklin Center for Interdisciplinary and International Studies, which is located in the renovated Hanes Annex.

Each year, the Institute will sponsor residential seminars that allow faculty a year of experiment, collaboration, and directed research outside of the normal structures of the traditional university. By defining each year of the seminars by a theme or a problem (rather than a discipline), faculty from diverse disciplines and departments can come together for concentrated collaborative thinking and, we anticipate, cross-disciplinary team teaching. The seminars give the University the opportunity to try something out to see if it warrants permanent support and growth. Initiatives build on current strengths at Duke and also push those strengths in new directions and sometimes even in directions contrary to those expected within currently available structures. Currently, eight Duke faculty and four advanced graduate students will be awarded fellowships each year to participate in the seminars. When possible, Center residency (with minimal remuneration) will be offered to various faculty who happen to be in the area. We are also working on exchanges with faculty at other research centers in the area (the

University of North Carolina's Institute for the Arts and the Humanities and the National Humanities Center). Where appropriate, the Black Faculty Strategic Initiative can offer a postdoctoral fellowship for residency in the seminars as well.

In order to make the John Hope Franklin Institute accessible beyond the specific problem-area of a given seminar year, a new category has been added to the Common Fund competition: "Franklin Institute Initiatives in the Humanities and Interpretive Social Sciences." These are competitions that seek to expand the scope beyond the faculty who are part of the seminars, to the larger community. Especially encouraged are research clusters and non-residential seminars that support other faculty working on ancillary areas. For example, in 2000-2001 the main topic is "Race, Religion, and Globalization." Most of the participants work on the modern period. The Initiatives could specifically call for proposals that look at migration, at changing definitions of race in the East and the West, in Europe and Africa, and that work back from the modern period to include medieval and renaissance scholars, those working on the ancient world, and those working on the pre-Columbian cultures. The emphasis would remain on interdisciplinary work and collaborative thinking, but the initiatives would reinforce the idea that excellent, path-breaking, interdisciplinary work is by no means confined to those working on the present era. There will always be an interplay of conversations across the full breadth of humanistic and historical inquiry, with outreach to the interpretive social sciences and sometimes to the sciences. This funding will provide the humanities and social sciences with an opportunity for groups to work together to propose experimental programs. The University of California system does this now to excellent effect, and the new Stanford Humanities Lab (partially modeled after Duke's Franklin Institute, as described in a 1999 article in *The Chronicle of Higher Education*) proposes a similar incubator model.

Other initiatives within the Franklin Center will complement and extend the work of the Franklin Institute for Interdisciplinary Studies. A workshop series called "New Technologies, New Knowledges" will showcase ways that technology has transformed knowledge in the humanities and the arts. The first year will especially focus on traditional areas of knowledge changed by the new technologies, including classics, medieval and renaissance studies, Chinese history, and Muslim networks. The series will demonstrate the Franklin Center's impressive media and informational technology offerings. The Center's student residents (University Scholars) and student neighbors (Trent Hall residents) will be offered internships in media and technology in which students are given the opportunity to use the cutting-edge technology of the Center in exchange for AV/informational technology support for various Center programs, conferences, and classes.

We are also working with Duke University Press toward the creation of two lecture series: one on the topic of the humanities seminars and another—including workshops—sponsored by Press leaders on issues of careers in publishing, revising dissertations for book publication, interdisciplinarity, and other matters of pressing professional concern to undergraduates, graduate students, and faculty.

Finally, the Franklin Institute's location in the consortium of programs that constitute the innovative Franklin Center is a tremendous asset to all aspects of the humanities. Scholars working in ancient, medieval, renaissance, and other pre-modern areas will be encouraged to participate in the life of the Franklin Center and to take advantage of the Center's diverse offerings and opportunities. To have a humanities initiative such as the Franklin Institute at the heart of the Center's inventive new model of interdisciplinary research, collaboration, and teaching—all linked with state-of-the-art technology—is rare. The physical reclamation of Hanes Annex, a former dormitory, offers the humanities many new possibilities. The building, its hardwiring, its administration, its programming, its constituent members, its international partners, and even the contiguous location of various complementary programs have all been thought through in an integrated and coherent way. We see this as a model for future interdisciplinary endeavors at Duke and at other universities as well.

### **Genome Sciences**

breakthroughs. This feature, if fully successful, will enable us not only to shape societal responses but also to shape the science itself, as researchers draw on the ethical and policy analyses in the development of their research programs.

Duke has already recognized the importance of this new direction in biology and its related elements, and is responding. Duke launched the Institute for Genome Sciences and Policy (IGSP) in fall of 2000. This institute brings together investigators and scholars from a wide array of disciplines, including those in the Schools of Medicine, Arts and Sciences, Engineering, Environment, Law, and Divinity. In addition, there is growing involvement in this area with other institutions in the Triangle, and dialogue is already underway with North Carolina State University, The North Carolina Super Computer Center, The North Carolina Biotechnology Center, and The National Institute of Environmental and Health Sciences. Duke is also a leading member of the North Carolina Genomics Consortium, an organization that is coordinating efforts throughout the state to develop genome sciences.

At present, the IGSP consists of five new centers:

- The Center for Human Genetics;
- The Center for Human Disease Models;
- The Center for Genome Technology;
- The Center for Bioinformatics and Computational Biology;
- The Center for Genome Policy, Law and Ethics.

These centers provide an excellent framework on which to build the IGSP. In addition to these, we expect the IGSP umbrella to be inclusive of other, related efforts, including:

- The Developmental Biology Program;
- The University Program in Genetics;
- The Human Vaccine Institute;
- The Integrated Toxicology Program.

### **Global Change**

Humanity now exploits half of earth's plant production and renewable, available freshwater. Most marine fisheries are fully exploited or overexploited. Humans are eliminating plant and animal species, the basic components of our life support system, at an extraordinary rate—far greater than at any previous time in human history. Policymakers have recognized that these changes jeopardize civilization, because reliable flows of ecosystem goods and services are crucial for economic welfare, human health, and social stability. Consequently, a number of international institutions—treaties, principles, laws, regulations and incentives—have been promulgated to protect and sustain ecosystems and the flow of goods and services that they provide. However, the basic science needed to achieve sustainable development is lacking. Wise stewardship of our life-support systems requires sound assessments of their current status and reliable

forecasts of future scenarios in response to possible management strategies. Without such information and forecasts, there is great risk to the national endowment of ecosystem goods and services.<sup>7</sup>

The new Initiative in Global Change will allow us to respond more quickly to rapid change in society's demands on science and a consequent shift in the way environmental science is done. Research questions are increasingly broad in spatial extent and focused at the interface of traditional disciplines such as ecology, earth sciences, math and computation, engineering, agriculture, and social sciences. Global changes, ranging from greenhouse warming and sea level rise to shifts in land use and urbanization, will affect the flow of ecosystem goods and services and pose fundamental, yet tractable, challenges for basic research in environmental science. Extrapolation across scales of space, time, and biotic organization is the fundamental problem confronting efforts to forecast and anticipate change.

Recent changes in the way environmental science is funded make it clear that proactive steps taken now can assure Duke's leadership role over the next decade. Failure to act will leave this role to other institutions. The traditional "program" mode of research funding is being increasingly augmented by problem-based initiatives targeted at interdisciplinary issues that blend scientific investigations with socioeconomic analyses of regional or global extent. A culture of interdisciplinary collaboration and training will position us for the changes in our science that are already underway. Our initiative should establish a leadership role for Duke University, allowing us to set the pace for environmental science in the next decade.

Duke University has an unusual concentration of expertise that is ready to meet the science needs of global change. We build on a tradition of excellence and on a history of leading new directions in environmental science that provide a springboard for this initiative. Individual departments are continually top-ranked, in terms of both research accomplishments and graduate training. Individual faculty members are at the forefront of global change research, through their leadership roles in scientific societies, service on agency panels that determine science funding and influence policy, and visible research accomplishments. Well-funded research programs in climate change, atmospheric CO<sub>2</sub> response, Geographic Information Systems (GIS), and remote sensing technologies have international reputations. The new graduate program in ecology provides an interdisciplinary context upon which this initiative can build. These strengths position us to meet the research priorities of the next decade. We can only gain from an initiative that exploits our strengths and fosters broad new directions in research here at Duke.

Duke is ready to take a leadership role in the interdisciplinary science required for global change studies and ecological forecasting, building on the current strengths found in earth sciences, ecology, engineering, computation, math, and statistics. Strengths that span both environmental sciences and social sciences provide a niche that few other

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<sup>7</sup> Paraphrased from the Research Priorities Statement prepared by the *Ecological Society of America* for NSF's *National Science Board*.

institutions can fill. Duke University can assume immediate leadership on a range of regional issues, but the initiative should also effectively promote a global research agenda. However, to build on that strength and create synergy among disciplines, we need additional academic positions that interface with atmospheric sciences, including regional and global-scale modeling.

Specific research needs will drive the directions of this initiative because well-funded, vigorous research programs must be at its core. However, our research should motivate and benefit from new ways to foster faculty interactions and an integrated training program that spans interdisciplinary areas. For instance, a flexible graduate program might permit focus on specific aspects of global change, such as surface waters, with research and training that involves the Nicholas School of the Environment, applied math, computer science, engineering, and so forth.

Designed in response to a national funding trend toward problem-based (rather than discipline-based) research, this Initiative in Global Change will create an umbrella structure for working groups of faculty (both internal and external) and students who would focus for a period of time on a particular research goal. The Center will begin as one of the first efforts in the new Institute for Interdisciplinary Science and Engineering. As it progresses, if it is successful, permanent space of about 3,500 square feet will be found. Working groups will compete for use of center facilities through a peer review process supervised by a steering committee. Additionally, working groups will develop and offer short courses related to their research topics, as well as graduate courses that will be offered in support of the ecology and engineering Ph.D. programs along with those of students in related departments. Initial working groups are proposed for ecological forecasting, element cycles coupled with the global water cycle, and renewable energy sources.

### **Information Science and Information Studies**

In order to give special focus to the new information technologies that are changing our world, the Provost created a Task Force on Information Science and Information Studies in spring 2000. The Task Force was created as a response to relatively weak attention to technology in the individual school plans as well as a realization that new technologies are a university-wide issue.

The Task Force was asked to concentrate on three areas:

- Curricular issues, including exploring the possibility of an undergraduate interdisciplinary program;
- An incubator program to actually put new technologies to use;
- Possible areas for distance learning, distance teaching, on-line learning and collaborations, and pedagogical enhancements through information technologies.

The first area, curricular, is aimed at a primarily undergraduate audience, although a by-product of identifying faculty with interests in information technology may well lead to a proposal for an interdisciplinary graduate offerings as well. For the undergraduate program, we are thinking of a core, introductory course that might include some basics of computer science coupled with a focus on social equity issues (the digital divide, access, globalization, intellectual property); legal and regulatory policy issues (including the range of legal, scientific, and economic issues around an open, free, and public domain of Internet knowledge); aesthetic issues (design, graphics, and other creative factors surrounding production); and humanistic issues (the history and literature of and about new technology). After this basic introductory course, students could then take more specialized courses within various fields and departments, ranging from engineering or computer science to the social study of science. Keeping a FOCUS track going on information technologies; revitalizing the Program in Science, Technology, and Human Values; supporting science studies intellectual initiatives by faculty and graduate students; and creating programs to make the best use of the new Kimberly Jenkins Chair in New Technologies and Society are other issues being discussed by this Task Force.

The second area has led to a proposal to create a Program in Innovation, an actual enterprise in which Duke students would work with faculty to create their own business ventures.

The third and final area considered by the Task Force on Information Science and Information Studies is enhancement of Duke learning through the strategic deployment of informational technology. Here we are fortunate to be able to take advantage of both the wisdom and the mistakes of others who have moved into this area ahead of us. What has been determined as the bottom line for our informational technology efforts is that technology is a pedagogical tool, an enhancement along with the other pedagogical tools, including lecturing, class discussion, reading and writing assignments, feedback, dialogue, laboratory partnership, mentorship, peer exchange, and other forms of intellectual modeling that have long been key to a university education. We are being circumspect about which technologies enhance pedagogy and which simply add more expenditure of time for no real value added.

Finally, as discussed above and in Part Two, we have been fortunate to reclaim the abandoned Hanes Annex and turn it into a home for the consortium of programs designated as the John Hope Franklin Center for Interdisciplinary and International Studies. The reclamation of Hanes Annex was conceived with an aggressive model of informational technology, including satellite up-links and feeds, a range of video projections (for video materials in a wide variety of world formats), and networked computing throughout the building. Technology internships for students, the “New Technologies, New Knowledges” workshop series, and elaborate virtual global partnerships are central to the Center’s collective program goals. Most important, we are conceiving of this fully networked consortium of programs as a place where Duke can do a cost-benefit analysis of distance collaborations, assessing both the financial costs and the extra human hours needed to partner conferences and colloquia with other universities

and centers around Duke, North Carolina, and the world. This will be one of the first cost-benefit analyses of distance collaborations conducted at any university.

### **Improve the Integration of the Arts into the Academic Mission of the University**

In a contemporary world where new information and media technologies have changed the ways our students receive, understand, interpret, and sort their knowledge, it is becoming increasingly necessary to think of the arts as another way of knowing the world and not simply as an enhancement or embellishment of other forms of intellectual life and research. This generation of students is far more likely to go to the Internet, not books, as a first source in their research. They play computer games that are, in many cases, as sophisticated technologically and conceptually as some of our most advanced research tools. As a number of scholars of information technology have noted, in recent years the military is as likely to go to the entertainment industry for new R and D ideas as the other way around.

Duke has never had a major presence in the arts; yet now, with the increased attention on science, engineering, and information technology, we need to be aware that sophisticated understanding and appreciation of the full range of the visual, aural, and performing arts is part of this new world so dominated by visual imagery, sensory manipulation, e-commerce, and communication through mass entertainment. By integrating the arts into the educational mission of the University, we could greatly enhance the educational experience of Duke's students and faculty through a very modest expenditure of resources. This is an era in which new technologies tap new kinds of creativity. Supporting the arts now could have an enormous future impact on the media that more and more dominate our lives and could help close the gap between C. P. Snow's "two cultures" at a time when, sadly, it is more preserved by our educational structures than practiced in the daily lives of most students.

In addition to adding to the wealth of knowledge and creativity of our students, a strategic arts initiative enhances Curriculum 2000, in which interpretive and aesthetic approaches is one of the categories in the learning grid. By supporting the arts more generally, we add to the overall intellectual atmosphere of the campus and also contribute to our goal of a more diverse student body. Many Duke students, including those most heavily invested in the sciences, come to us with extensive backgrounds in the performing arts. It is almost impossible to sustain those interests and skills on a campus that too often seems un-welcoming to the arts. Hence, in many ways an enhanced arts strategy enhances the learning, research, and social environment of our entire community.

One way of enhancing the modest offerings in the arts at Duke is by beginning to look into the creation of an integrated arts facility—perhaps in the Warehouses, if that purchase is completed—that would offer flexible studio, practice, repertoire, exhibition, and experimental space for faculty, students, and visiting visual artists, musicians, dancers, actors, and performance artists, as well as film, video, and digital artists. Before planning such a renovation, we would need to take an inventory of what is available at

Duke and in Durham, and what would be the most creative, economical, and interesting way to create an integrated arts facility for the campus. Shared spaces, open areas, and other loft-like areas should complement more developed and designed areas. Some facilities might also serve to enhance Duke's relationships with neighboring universities and with the Durham community (such as a color dark room, currently not available anywhere in the Research Triangle) or to support both Duke and Durham arts activities (such as the American Dance Festival). Because of the increasing synergy between the arts and technology, this arts facility might also serve as the home for new programs in information science and information studies. Computer-assisted design courses, for example, are now offered by the art department but enroll almost as many engineering as arts students. A new integrated arts facility should be designed with the *current* student (both arts majors and non-majors) in mind.

## **Materials**

The astounding changes in our world that have resulted from the widespread use of computers, lasers, and novel materials represent only the early stages of a radical transformation of our material culture. The future holds the promise of tiny sensors and computers embedded in everyday objects; interfaces between physical devices and biological systems at the cellular and molecular level; lightweight materials with unprecedented strength; and tiny machines that operate on sub-cellular scales. These will have profound effects on everyday life as well as on physical sciences, biological sciences, and engineering disciplines.

Materials science and engineering focuses on the development of the materials needed to support the technological advances in today's society. There is faculty strength in many areas of materials at Duke. The two areas that we believe hold the most promise for the future, however, are the areas of biological, or "soft-wet" materials, and nanostructures. Faculty working in these areas have appointments in chemistry, physics, electrical and computer engineering, mechanical engineering and materials science, biomedical engineering, biology, and mathematics as well as in several of the basic science departments, such as cell biology. Increasingly these faculty are working in interdisciplinary teams and have common needs in training and infrastructure.

We believe that Duke is in a good position to be a leader in both of these areas. Nanoscience is a field in transition where new chemical synthesis techniques for creating nanostructures are opening up fundamentally new types of structures and materials, and the interface between physical nanostructures and biological systems is becoming a new focus of attention. Traditional materials science and engineering provided important design information for the engineered use of metals, ceramics, plastics, semiconductors, and composites for society in the previous millennium. Carbon-based, soft-wet materials science and engineering will be one of the basic building blocks that are necessary for the upcoming biological revolution to occur.

To support these efforts, we will establish a Materials Instrumentation and Fabrication Facility (MIFF). This facility would be available for use by all materials faculty and would be staffed by the University and equipped by a combination of start-up funds and instrumentation grants (with University matching funds). In addition, we expect to hire new faculty in engineering, natural sciences, and basic sciences. This central facility will be a very efficient mechanism for developing several programs of high impact at Duke.

### **Micro-Incentives Research Center**

This center is designed to breathe new life into the study of political economy at the micro level of analysis, to develop an intellectual community among microeconomists and social scientists interested in microeconomics, and to facilitate development of research proposals in applied microeconomics. The new Micro-Incentives Research Center, which grows out of the “economics initiative” described in the Arts and Sciences strategic plan, will administer and coordinate instruction and research activities. The first year will focus on developing relationships among the broadly conceived “economics” faculty in the colloquium series and associated working paper series; the second on adding biennial conferences and funding for a major outside initiative; the third on implementing the full program, with the major addition of two postdocs who will teach two courses over the academic year. By the fourth year, except for the post-docs, the project expects to be self-financing.

### **Neural Analysis and Engineering**

To effectively build on investments that Duke has already made in brain science, including building four outstanding units:

- The Bryan Alzheimer’s Research Center;
- The Department of Neurobiology;
- The Brain Imaging Analysis Center;
- The Center for Cognitive Neuroscience;

and with the refocusing of psychology-experimental into the department of brain and psychological science, an interdisciplinary effort is necessary that brings together Duke’s significant strengths in analysis, computational modeling, and neuroengineering to develop a balanced program with strength in both experimental generation of data and in data analysis. The amount of data we now have in this area is enormous and will only continue to grow. There are a number of faculty distributed across campus with interest and experience in neuroanalysis and modeling, especially within the following centers:

- The Center for Nonlinear and Complex Systems;
- The Center for Neuroengineering;
- The Center for Mathematics and Computation in the Life Sciences and Medicine.

In order to move forward, we will develop a postdoctoral training program, a doctoral program, and computing facilities as part of our general High Performance Computing (HPC) program. New faculty hires will be needed starting in 2003/2004.

### **Photonics and Communications**

Since the discovery of the laser approximately forty years ago, and the recent development of advanced light sources, our understanding of how light interacts with matter and how these interactions can be exploited has progressed at a truly astounding pace. It is now possible to make movies of chemical, condensed matter, and biological reactions that take place on the femtosecond time scale (one millionth of a billionth of a second) and to transmit the entire Library of Congress from New York to Paris in a blink of an eye using optical techniques. This optics revolution, on both the fundamental and applied frontiers, will entirely change the way we live, improve our health and well-being, and give us a much deeper understanding of the world around us. Based on this vision, photonics is and will continue to be a vibrant discipline of vital national importance that has been identified as a priority area by many federal agencies.

In our opinion, the most important advances over the next few decades will be in the areas of bio-optics and optical communication and computation. In general terms, bio-optics involves the use of photons to probe or modify biologically active materials. Optical communication and computation are the backbone of the information revolution and involve the use of pulses and light in conjunction with nonlinear optical methods to process and transmit binary information.

Duke plans to be a leader in this photonics revolution by bringing together and building on current strengths in Engineering, Arts and Sciences, and the Medical Center, as well as facilities such as the Duke Free Electron Laser Laboratory, and by conducting strategic development to recruit additional researchers in focus areas. Faculty working in this area will be supported by new facilities in the west wing of the new engineering building. Each faculty member will have a presence in her or his own department as well as use of these shared facilities. This will encourage maximum interaction among researchers and allow our program to advance beyond that at other institutions.

Another exciting aspect of the initiative in photonics and communication is the opportunity for interdisciplinary training of students. Like the faculty, the students will be associated with and receive their degrees from a specific discipline but will have the opportunity to augment their training by taking photonics courses from members of the broader program. In addition, their educational experience will be enriched by their proximity to students from other disciplines and from photonics seminars, since they will be exposed to its application to other areas of science and engineering. In addition, there will be significant ties to industry, which will give other educational opportunities in the form of internships and industry-relevant independent research projects. There is

currently a great national need for such interdisciplinary training, but few institutions have programs with the breadth planned here.

### **Science and Engineering Research Institute**

The case has been regularly made throughout this Plan that one of the most fundamental challenges that the University faces in the future is how best to encourage and support new and ongoing interdisciplinary initiatives. Given our small size and the close proximity of our science and engineering units—to each other and to those connected with the Medical Center—we should be much more agile and effective at creating such efforts than larger universities. Nevertheless, there are fundamental obstacles that must be overcome. Too often, the needs of interdisciplinary centers are in conflict with the demands of departments and schools. The burden that interdisciplinary activities place on faculty time, and the disincentives inherent in the reward systems that we currently employ, make active participation much more difficult than it should be.

As a partial mechanism for dealing with these problems we will create a Science and Engineering Research Institute. Part of this Institute will be devoted to bringing together faculty for a semester or a year around the development of a new program or the activities of an existing one. Faculty from within Duke will be appointed to the Institute and will not have departmental teaching responsibilities during that period. In return, they will be expected to develop new research and educational programs related to the supported initiative. These programs could also include the creation of new interdisciplinary graduate and undergraduate courses in the area as well as the development of new collaborative research proposals. Visiting faculty, graduate students, and postdoctoral faculty will also be important elements, with vertical integration of the activities of the program as an expected outcome.

Another part of the institute will be available for use on a regular basis by established interdisciplinary programs. It will contain appropriately designed spaces to encourage interaction. This space will not contain wet labs, for that, we believe, is the principal reason that the LSRC has not met the need the new institute is designed to address. This Institute will incubate new programs for a fixed period of time and then the participants will be required to move out. Participants in such initiatives who have lab requirements will therefore need to keep their own labs, and visitors will need to be offered lab access outside the Institute's space. Office space, however, will be freed up

The Institute will help maintain the vitality of existing interdisciplinary programs as much as it will foster the development of new ones. A properly designed space will serve as a mechanism for regular interaction via seminars, colloquia, common room discussions, and other activities.

The programs to be incubated in this space will be determined by the Provost. Early possibilities include:

- Global Change;
- Bioinformatics and Computational Biology;
- Nonlinear and Complex Systems;
- Computational Science and Engineering;
- Neural Analysis and Engineering.

The academic priorities and initiatives outlined in Parts Two and Three of the Plan will be supported through the academic and administrative support plan, which is detailed in Part Four.

## PART FOUR

### ACADEMIC AND ADMINISTRATIVE SUPPORT PLAN

This chapter outlines the critical academic and administrative services that will support the larger goals of the Strategic Plan. It is clear that attaining our academic goals will require assistance from a number of different university service units. For purposes of this chapter, these services are divided into three sections:

- **Direct Support for the Academic Plan**, which describes several areas closely associated with the academic objectives of the strategic plan;
- **Support for Duke's Workforce**, which provides an overview of how the Office of Human Resources and the Office of Institutional Equity will facilitate recruitment and training of staff and faculty to carry out the strategic initiatives and Duke's overall mission; and
- **Support for Duke's Outreach**, which outlines how Duke's reach extends beyond the physical limits of its campus through its relations with the local community, the private sector, local universities, and an environment that includes the surrounding Forest.

#### **I. Direct Support for the Academic Plan**

##### **A. Student Life**

Frank Newman noted, in *Saving Education's Soul*, "that the most enduring role of a university has been the socialization of young people for their roles in society." He further notes that a university education prepares students for civic responsibility, appreciating diversity, problem solving, and preparation for living in a global society. In many ways, Newman identifies the role of the Division of Student Affairs at Duke University and sets a background for its vision and ambitions.

At Duke, similar to other research universities, much of the socialization of students occurs outside the classroom. Socialization occurs in the residence hall, the commons room, the cafeterias, on the quads, in student organizations, and at social events. The offices of the Division of Student Affairs are either responsible for or intimately involved in most of these student experiences. Further, the Division takes a leading role in teaching, training, supervising, and modeling the life skills and attitudes fundamental to learning civic responsibility, problem solving, and living in a culturally diverse world.

With the above vision in mind, the Division of Student Affairs identified its values and operating principles, which are to promote:

- Educational Excellence;
- Civility and Respect;
- Responsibility and Accountability;
- Honesty and Integrity;
- A Productive and Diverse Workplace.

Specific goals have been established to support the implementation of this divisional value system. (Details are contained in *Division of Student Affairs: Strategic Plan, FY02-FY06.*)

### 1. Provide an Engaging, Safe, and Welcoming Campus Climate for all Members of the Duke Community

- **Expand, strengthen and improve the New Student Orientation Program**

No time is more critical in helping students establish a sense of belonging and comfort than their first several months on the campus. The East Campus experience provides the Division a unique opportunity to aid new students in adapting to the academic and social aspects of Duke while adjusting to being away from a supportive home environment. Continued funding support will be required to maintain the scope and quality of our current orientation.

- **Improve the availability and quality of the services offered to students of color, international students, and cultural groups**

At the present time, the Division has a small staff responsible for all cultural, academics, orientation, and social support services for a growing minority population of students of color and international students. Since the vision of the University is to recruit and retain a culturally and internationally diverse student body, it is imperative that support services for these students be increased. We look forward to being significant participants in expanding multicultural and international students' facilities and contributing to their education and programming.

- **Initiate a "Safe on Campus" program**

This program is designed to reduce homophobia and increase understanding on Duke's campus. Through education, advocacy, and awareness training, the program will contribute to an open campus climate that is safe and accepting for all who are in the Duke community.

### 2. Foster a Respectful and Safe Community Focused on Multi-Faceted Learning and Student Development

- **Formalize our learning objectives**

The Division of Student Affairs is in the process of identifying learning objectives—that is, the knowledge and skills—that are promoted, taught, supervised, and fostered by offices in the Division. These objectives will give the various offices guidelines based upon human development principles for planning, implementing, and assessing the quality of teaching, training, and programming.

- **Focus on character education**

The Division will initiate programs focusing upon character education, i.e. the development and practice of civility, cooperation, ethical behavior, and personal responsibility. All offices in the Division will be actively involved in this initiative; however, leadership will be invested in the Office of Student Development.

- **Expand the residential staff to include full-time professionals living on campus who are actively engaged with student life**

It has become apparent that to actively promote civility and responsibility, as well as to maintain discipline in the residence halls, it is highly desirable to have professionally trained adults living in the halls. Thus, the Division of Student Affairs is looking forward to staffing the hall with Residence Coordinators (professionals trained in residence hall management) to serve as advisors and mentors and to monitor and implement the rules and regulations of the residence hall system.

### 3. Develop a Rich Co-Curricular Experience for all Students that Encourages their Active Engagement, Participation, and Reflection

- **Establish and assess learning outcomes**

The vast majority of time students spend at Duke is outside the classroom. A significant portion of students' learning occurs in the residence halls and in co-curricular activities. To provide an optimal education, the Division of Student Affairs must plan, develop, implement, and evaluate the numerous co-curricular experiences it sponsors. Thus, it is important that the staff of the Division identify specific learning objectives, identify the means by which they will reach the designated outcomes, and implement methods for evaluating the end product.

- **Establish an assessment function within the Division**

The Division of Student Affairs must be capable of performing ongoing assessment and evaluation of student needs and opinions. It must track issues of student development, including the most current and accurate information on college students and their characteristics, and assess the outcomes of programs and activities. The Division should add an evaluation and assessment capability to carry out these functions.

- **Review and revise policies to establish explicit expectations for student behavior**

A major function of the Division of Student Affairs is its responsibility for student discipline through the efforts of the Undergraduate Judiciary System. As major issues of student behavior have arisen, e.g. assault, alcohol abuse, and academic dishonesty, and as our society has become more litigious, it is necessary that parts of the Undergraduate Judicial Code and the Alcohol Policy be reviewed and revised. The sexual assault component of the Judicial Code and the Alcohol Policy will be the first parts of this task we will undertake.

#### 4. Encourage Good Health and Well Being

- **Consolidate and relocate Student Health Services to a location closer to the University campus and more accessible to students**

The Division will promote and support the relocation of the Student Health Service (SHS) from its present location in the Pickens Building to the lower level of Duke South. This move will provide numerous improvements in access to health services, as the student entry will be adjacent to West Campus. Further, this location will be devoted solely to services to students, making it more desirable for students to use. This relocation will also allow the Student Infirmary to be adjacent to the Health Center. Thus, physicians will be readily available to supervise student care in the Infirmary. Also, offices for health education personnel will be included in this facility to foster improved supervision, planning, and collaboration among Health Services staff.

- **Providing expert alcohol abuse assessment and referral services**

The Division will provide education, assessment, and referral services for students experiencing alcohol problems. Recruitment is underway for a licensed and specialty-trained psychologist to fill this position. Appropriate programming support will be required once the position is filled

- **Provide additional individual and group counseling appointments for students**

National trends indicate that mental illness is increasing among the college population. Studies note the inadequate student mental health service at a number of prestige universities. At present, with its multidisciplinary staff of psychiatrists, psychologists, and social workers, CAPS is a model of effective and efficient mental health service delivery and serves a significant portion of the student body. If national estimates are accurate and if the enrollment at Duke is increased, changes to increase CAPS service delivery capacity will need to be implemented.

- **Advance a healthy lifestyle for all members of the community by promoting healthy eating, positive body image, and physical fitness as well as by offering psycho-educational workshops**

More efforts will be made to promote health and wellness of students in coming years. Such promotion of preventive health has not only immediate, but also lifelong, benefits to Duke students. The Division of Student Affairs looks forward to increased collaborative efforts with the Duke Health System, as well as with representatives of Athletics and Recreation programs and officials on campus.

#### 5. Plan and Advocate for the Human, Physical, Fiscal, and Intellectual Resources to attain the Division's Goals

- **Ensure that all Student Affairs facilities are accessible to all students and staff**

The Division will work with the University Access Committee to prioritize renovations that will provide access to all programs and services in the Division, especially in the Crowell Building (elevator), Page/Flowers (elevator), Women's Center (ramps), and International House (ramps).

- **Develop a facilities plan that keeps pace with staffing, service, and programming goals**

The Division will advocate for renovations in the Bryan Center and West Union that will provide adequate space for student organizations and the offices that support and advise them. Relocation of the Career Center and expansion of CAPS counseling areas will be considered.

- **Recruit and retain a diverse and highly qualified staff**

The Division will regularly review compensation for all staffing positions and adjust salaries to meet market demand as well as recognize individual and team contributions. Increasingly, Student Affairs is losing recruited candidates, especially staff of color, to other institutions. The prestige of Duke alone is not enough to draw the best candidates. These issues will be addressed.

- **Use technology to extend staff resources and create opportunities for additional methods of information and outreach to students**

The Division must increase the Information Services staff to provide ongoing web development and support as well as cross training and reasonable workloads for all IS staff.

- **Ensure that department and unit non-salary operating budgets are appropriate and adequate to realistically support their goals and objectives**

Many areas of Student Affairs operated for years with budgets that were inadequate to fulfill their missions. It is primarily through the hard work and creativity of deans and directors that Student Affairs has been able to offer such a wide array of

programs and services on modest budgets. In the past five years, through a series of strategic reallocations as well as general increases in Division resources, many of the historically under funded budgets were brought to basic operational level. However, many needs remain, and should be addressed.

## **B. Student Administrative Services**

The goal of Student Administrative Services is to provide outstanding service to students throughout the University. In the case of undergraduate students and prospective students, this concept of service extends to parents as well. The goal is to ensure that students can transact routine business conveniently and with minimal effort. Students with special needs should receive courteous and professional attention from staff who have a strong service ethos, a common understanding of university policies, and access to all the information pertinent to resolving a particular issue. Realizing this service concept will require teamwork among people working within schools and in central student administrative service offices. The Office of Student Information Services and Systems and the PeopleSoft Student Administration System, which went into service in fall 2000, will support these efforts. The principal central offices collaborating in this endeavor are the Division of Student Affairs, Bursar's Office, Registrar's Office, Undergraduate Financial Aid Office, and Student Loan Office. Administrative officers in each of the schools and in Auxiliary Enterprises (Housing, Duke Card Office) are also involved.

### **Specific goals are to:**

- Complete the PeopleSoft software implementation and the fine tuning of the technical architecture that supports distributed network access by students, faculty, and administrators. Proceed with continuous improvement plans to ensure the best service to all constituencies through new functionality, particularly web technology;
- Ensure that the PeopleSoft academic advising module supports the curricular needs of each school, with particular attention to the successful implementation of Curriculum 2000 in Trinity College;
- Locate critical student administrative services in West Campus space accessible to students that supports new service models based on greater cooperation and cross-training across traditional office boundaries;
- Ensure closer integration of all web access to student administrative services through a common portal and common design and performance standards;
- The common portal should be part of the student portal described in the academic plan;
- Give parents web access to student academic and financial records to the extent possible under federal regulations.

## C. Library

The elements of the Library's strategic plan are contained in *Critical Choices: Perkins Library System Plan 2000-2005*. The plan builds on a number of recently completed internal studies, including digital initiatives, collection budget analysis, support staff needs, storage, preservation of library materials, and the future direction in acquisition and processing of paper and electronic information. The Perkins plan is organized around four themes: Library as Gateway to Information and Scholarship; Library as Facilitator of Teaching, Learning, and Research; Library as Place; and Library as Work Environment. Each theme provides a series of goals and strategies for implementation. The following is an "executive summary" of these goals, organized around the goals articulated in the University's draft plan.

### 1. Build an Excellent Faculty in Every School and Promote Major Multi- and Interdisciplinary Programs

Duke's ability to recruit, retain, and build an excellent faculty is intimately linked to the strength of its library. Similarly, support for the development of multi- and interdisciplinary programs depends upon a world-class library. Many of the recommended paths of action in *Critical Choices* provide directions for fulfilling this mission.

Physical facilities must be adequate to the needs of faculty and students. The renovation of Perkins Library, the completion of the Library Service Center, solutions to Lilly Library space problems, and modernization of the Music Library's Media Center are all key actions to making the Perkins Library System the intellectual core of the University. Inviting space for intellectual interaction, individual and group study, and information exchange, as well as housing for physical collections, is the hallmark of this focus on facilities and will create the library that this university deserves.

Strong collections in a variety of formats are critical in the recruitment and retention of quality faculty. Several strategies outlined in the library plan position Perkins to fulfill this goal:

- Redefinition and expansion of collection building to support teaching and research;
- Creation of sophisticated document delivery mechanisms to guarantee access to information needed to support teaching and research, regardless of its location;
- Identification of under-supported areas within the collections budget;
- Formalization of Library Impact Statements during the approval process for new programs;
- Creation of a preservation department and implementation of a preservation program to ensure that Duke's information resources are available to future generations of students and scholars.

## 2. Significantly Strengthen Science and Engineering

The existing branch library model of discrete collections in engineering and the sciences no longer best supports the interdisciplinary discovery, research, and teaching efforts of the University. The availability of digital information has dramatically changed how researchers in science and engineering do their work. The library's collections, staff, and physical spaces are being used in new ways. The increase in interdisciplinary research and study such as the chemistry of biological processes, biomedical engineering, and new research in genome sciences spans disciplines and demands a fresh approach to library facilities to support this work. The physical consolidation of the mathematics and physics collections at Teer, while quickly and inelegantly accomplished this summer, is a first step in this direction. The Perkins plan calls for considering further consolidation of facilities.

## 3. Be Among the Best Universities at Integrating Teaching, Learning, and Research and Provide Education of the Highest Quality

- **Support of Curriculum 2000**

The new curriculum provides many opportunities for librarians to partner with faculty in reshaping the undergraduate experience. A Coordinator for Library Instruction and Outreach, currently being recruited, will have primary responsibility for leading Perkins in this area.

- **Expansion of training in research skills and information literacy**

Strategies include a focus on electronic information literacy and proficiency with graduate student training, faculty consultation, and partnering with the Center for Instructional Technology in providing content for course web pages.

- **Creation of the Digital Library at Duke**

Building upon the Library's experience and strength in the acquisition, creation, and delivery of electronic information, this initiative will transform the way campus libraries support the teaching, learning, and research environments. Collaborating closely with faculty, the Office of Information Technology, the Center for Instructional Technology, and other stakeholders, the Digital Library at Duke will build the unifying organizational structure necessary to support this work.

- **Development of innovative, customized reference services for users regardless of location**

Recognizing that our community is global, we will create real-time service models.

- **Strengthening of relationships with faculty, departments, and programs**

Adapting a library structure for collection development and service provision that better matches the academic environment in which we work will lay the groundwork for better communication and support of teaching, learning, and research.

- **Better promotion and marketing of library services**

Many existing services, facilities, and roles of the library are not well known or understood. Active promotion of the library will address this issue.

- **Promotion of an understanding of scholarly communication issues**

The explosion of digital technologies, which allow rapid and easy transfer, duplication and digitization of information, changes the teaching, learning, and research landscape. The library, along with other campus partners, has a significant role to play in increasing awareness and understanding of such critical issues as the economics of publishing, the evolution of scholarly disciplines and its effect on publishing, information policy, copyright, the interactions of academic rewards systems and publishing, and new communication technologies and their potential. It is critical in the new information environment that faculty be aware of these scholarly communication dynamics.

- **Support of lifelong learning**

Teaching, learning, and research should span the lives of Duke graduates. We intend to work with Alumni Affairs and other campus partners to create a plan for facilitating a lifelong information connection with the University, exploiting electronic services and resources.

- **Support of faculty learning**

Provision of widely available, easy to use, and highly reliable academic technology tools that simplify faculty use of technology in high interest areas and promote the integration of research into teaching

Technology should enable a faculty member to move easily between his/her research environment and the classroom environment, sharing research in progress with undergraduates.

#### 4. Intensify the Use of Information Technology

Technological changes are transforming the landscape of scholarship, creating revolutionary new opportunities and challenges for both scholars and libraries. Academic research is increasingly conducted online as scholarly communication migrates into the digital realm and exploits alternatives to standard methods of publishing. Faculty members turn in increasing numbers to instructional technology tools, not only to manage

classroom administrative details, but also to transform the educational experience. And the business of the library depends upon a robust technological infrastructure and sophisticated hardware and software applications. Relevant elements of the plans of Perkins Library and the Center for Instructional Technology include:

- **Creation of the Digital Library @ Duke**

This is an initiative to use the opportunities presented by new technologies to enhance traditional resources and services in the creation, discovery, delivery, use, and preservation of digital information.

- **Provision of appropriate support for academic technology**

This includes academic technology assistants, teaching spaces, student computing facilities, technology training matched to course needs, and project support. Provision of widely available, easy to use, and highly reliable academic technology tools will simplify faculty use of technology in high interest areas and promote the integration of research into teaching.

- **Migration to the next generation of library technology**

The campus libraries will be implementing a sophisticated suite of applications that will streamline in-house business and cataloging operations, as well as provide better access to information held here at Duke, in the Triangle, and throughout the world, including full text electronic information.

## 5. Promote Diversity in All Aspects of University Life

Key among the strategies in the library's "Work Environment" section is the imperative to foster a collegial workplace where diversity is recognized and respected. Led by an internal Diversity Working Group, the Perkins Library system has implemented programs and procedures that foster a work culture that values diversity, and in which everyone feels welcomed, valued, and respected. The Strategic Plan uses much the same language as that of the Perkins initiative: community built around diversity in all its dimensions, full range of human difference and potential, commitment on the part of all of us to working through and understanding more fully what diversity means to our endeavor, and so forth. Not only can the Perkins Library contribute to this goal, but it can also provide excellent models. Recipient of one of the first Duke University Diversity Awards, the Perkins Library has planned and begun implementation of a cultural change process that includes everyone in the organization and is managed by a group of staff volunteers.

Finally, some thought has been given in the library plan to the staffing necessary to implement this vision and to support the teaching, research, and service mission of the University. In a section entitled "The Library as the Ideal Work Environment," goals include the implementation of a performance management initiative, development of

career paths for support staff, enhancement of recruitment and retention of staff, preparation for the next generation of library staff, and shaping and defining the changing research library. While these goals and strategies are Perkins-specific, they do reflect a focus on staff needs in this planning process and acknowledge that a strong and vital library staff is critical to a well functioning library.

#### **D. Capital and Space Planning**

Duke University has historically approached capital project planning and budgeting on a “unit by unit” or “project by project” basis, as opposed to taking a more global, unified, and integrated approach. By definition, capital budgeting involves planning for the best selections and financing of long-term investments. It is therefore a critical component of our planning and ongoing budgeting process. Early in the strategic planning process, the Executive Vice President and Provost articulated the need to develop a more formal capital budget process that identified, evaluated, and integrated capital planning to ensure that:

- Capital needs and projects are coordinated and optimized across the entire University and in sync with academic priorities;
- Capital formation and financing strategies are clearly documented, understood, and maximized across the University for efficiency and effectiveness;
- Academic and administrative program planning is linked to the approved campus master plan.

In support of the strategic and master planning processes, the University will develop a comprehensive and unified capital budget that will include all capital projects on the five-year horizon and the underlying capital financing strategy.

The objectives of the capital budget and planning process are to:

- Provide a disciplined process to support the capital needs associated with programmatic expansion, renovation, and renewal and to prevent the development of capital deficits;<sup>8</sup>
- Optimize the use of available resources through priority setting and analysis of trade-offs in the allocation of capital resources from fundraising, school, and central sources and the issuance of debt;
- Ensure that funding is in place for approved capital projects and that cash flow requirements are understood and provided for;
- Provide a framework for workforce and project management planning in relation to approved capital projects;

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<sup>8</sup> Capital deficits can arise either when programs expand or change without regard to capital infrastructure (facilities and equipment) requirements or when current capital infrastructure is not adequately maintained and renewed.

- Articulate a debt policy and develop a capital plan that is consistent with maintaining (or strengthening) the University's Aa1 bond rating;
- Formally integrate the deferred maintenance/ADA funding and expenditure plan with the unified capital plan.

The Capital Plan will focus on major facilities, systems, and equipment projects and should include a formal five-year outlook (supplemented with a ten-year horizon for the most significant capital needs), with the understanding that anything beyond the first three years contains greater uncertainties. Using the existing terminology contained in our policy and procedure documents, the formal capital budget should include the following:

- Capital Projects: a project with a budget of \$1,000,000 or greater;
- Major Projects: a project with a budget of \$100,000 and \$999,999.

Each project should include sources of funding in the following categories:

- Debt (indicate internal or external and repayment source);
- Gifts and/or Grants Received, Pledged, Planned (indicate source);
- Unit Reserves (identify source);
- Central Resources (identify source);
- Operating Budget (identify source);
- Facilities Renovation and/or Deferred Maintenance Funds.

In addition to their submissions for inclusion in the university-level capital budget, all units should also prepare a minor capital expenditure budget for the following:

- Minor Projects: a project with a budget between \$5,000 and \$99,999;
- Minor Capital Expenses: For furnishings and office equipment, including computers and related peripherals. Each unit should develop a systematic replacement plan and budget an appropriate level of funding, either in the operating budget, or the minor acquisition accounts (4xx), to provide for the continuous renewal of minor capital.

The formal Capital Budget will be maintained by the Capital Budget Officer, in the Division of Financial Services, and the annual budgeting process will be coordinated through the management center financial offices, capital budget committee, the university architect, and facilities management.

## **E. Office of Information Technology**

In response to the challenges represented by the University's strategic goals, the Office of Information Technology has created a set of organizational goals to align itself with the institution's strategic direction. OIT has identified five key areas in which to focus its efforts. These are:

## 1. Expanding, Coordinating, and Distributing IT Support Efforts Across the University

OIT's primary role is that of a service provider for the university community. To this end, OIT plans to provide IT support on a 24/7 basis to the university community and plans to strengthen its efforts to coordinate and facilitate distributed support initiatives within each of the schools and colleges. OIT will:

- Provide a replicable IT support framework for academic departments at Duke;
- Assess and facilitate the identification of IT resources needed to support faculty in schools that do not have departmental IT support organizations;
- Collaborate with appropriate university organizations on training opportunities;
- Build stronger virtual support mechanisms for faculty and students, including online self-help facilities and 24/7 electronic access to live IT support staff;
- Fund and train a roving Internet 2 and advanced application support team and use the team to facilitate expanded use of Internet 2 and other sophisticated resources (NCSC, for example) by faculty and students;
- Work with other campus units to establish baseline student technology skills;
- Provide leadership for IT organizations by implementing hiring and human resources practices within OIT that foster and preserve dignity.

## 2. Extending OIT's Efforts to Communicate Effectively with all Sectors of the Campus Community Regarding Information Technology Issues, Needs, and Facilities

OIT's success is largely contingent upon its ability to effectively communicate with its customers in the institutional community. OIT will take specific steps to foster communication with the university community. OIT will:

- Solicit faculty involvement in the specification process for new systems and processes;
- Solicit input and review from representatives of the student body to ensure that OIT initiatives are aligned with student needs;
- Design and deploy an institutional infrastructure for the development and administration of online surveys;
- Assist in the identification, development, and communication of information technology standards and best practices;
- Work with selected faculty to establish a collaborative program of research and development for new technological tools to meld strong research with excellent teaching;
- Continue the successful collaboration between OIT and the various administrative project teams on campus, with an eye toward keeping those teams informed of academic and instructional technology requirements;
- Broaden OIT's use of new and innovative communication methods to keep the faculty and the community at large abreast of changes in its services and systems;
- Gain an understanding of how online access to traditionally offline information resources affects student, staff, and faculty use of the IT infrastructure, and adjust the infrastructure to accommodate new usage patterns.

### 3. Facilitating the Exchange of Electronic Information and Resources Among Faculty, Staff and Students

Virtually every academic activity depends upon effective and reliable communication. As traditional modes of communication are extended or replaced by electronic vehicles, OIT will provide a coherent and expanded set of electronic communication services to the Duke community.

As information technologies have moved beyond the confines of the research laboratory and have become thoroughly integrated into everyday life, issues of usability, availability, and accessibility have also grown in importance. One of the primary goals of contemporary IT organizations is to expand access to IT. Recognizing this goal, OIT plans a number of initiatives to simplify user access to information and information technology and to make IT resources ubiquitous at the University.

Toward this end, OIT will:

- Assist the Center for Instructional Technology in its efforts to select, implement, and support technology tools that enable innovative, high-quality teaching;
- Provide an infrastructure for the application of web-based multimedia technologies outside the classroom, in support of research communication and collaboration;
- Continue efforts to provide a world-class, high-speed network infrastructure for the campus community, in support of academic endeavors;
- Facilitate the sharing of IT resources (such as software and templates) and expertise, in support of CIT efforts;
- Work with Perkins Library and staff from other area research libraries in support of their efforts to build an infrastructure for secure inter-institutional access to digital library resources;
- Build flexible network-based conferencing facilities incorporating integrated voice, data, and video to encourage interdisciplinary groups on campus to self-organize and communicate effectively;
- Design an enhanced electronic messaging infrastructure for the campus that incorporates secure and trustable electronic mail facilities, instant messaging facilities, and collaborative group discussion tools;
- Leverage existing institutional networking and authentication facilities to build a truly institution-wide secure shared file system;
- Provide pervasive networking facilities in traditionally non-network-accessible locations throughout campus;
- Work with other groups on campus to devise better strategies for organizing, publishing, and providing access to web-based information resources at Duke;
- Facilitate convenient, secure, reliable, and adaptive remote access to campus information services;
- In support of ubiquitous access to information technology, complete the design and deployment of a campus-wide directory service and build facilities and systems based on the enterprise directory.

#### 4. Designing and Implementing Information Systems and Services Targeted Specifically to the Needs of Faculty and Researchers

During the 1950s and 1960s, a significant fraction of the world's IT resources was dedicated to academic research. In recent years, information technology has grown to offer benefits to a much wider audience. If the University is to achieve its goals with respect to building an excellent faculty and strengthening teaching and research in the sciences and engineering, OIT believes that a renewed focus on the IT needs of faculty and researchers is necessary. OIT plans a number of initiatives to deliver information technology and services to the faculty in new and broader ways. Specific objectives include:

- Designing and delivering on-campus networking facilities for researchers to experiment with and research new and emerging information technologies;
- Collaborating with key faculty from the sciences and engineering to establish and promote on-campus and off-campus high-end computing facilities targeted toward high-tech and interdisciplinary research;
- Providing additional hardened machine room space in support of academic and research initiatives;
- Assisting the Center for Instructional Technology in providing facilities, both within and outside the classroom, which support collaborative teaching and the integration of faculty research with teaching;
- Developing and offering an IT project management service in support of research and educational IT projects;
- Partnering with faculty in research projects involving information technology and voice/video/data networking.

#### 5. Designing and Implementing Information Systems and Services Targeted Specifically to the Needs of Students

Just as critical as the delivery of support to Duke's faculty is the delivery of support and services to its largest and most diverse constituency—students. As the institution increases travel and distance learning opportunities, the delivery of information technology services to students becomes increasingly complex. OIT plans to meet this challenge by delivering IT resources and support to students, both within and outside the classroom. Initiatives include:

- Providing co-op and internship opportunities for undergraduate and graduate students at Duke and other local colleges and universities;
- Soliciting input from and involvement by students in a wider range of OIT efforts;
- Determining the technology infrastructure needed in the student residence halls and working with appropriate groups on campus to ensure that the needed infrastructure is provided;

- Expanding on the nascent University Writing Program initiative to deploy a student-oriented electronic portfolio system suitable for use by students in designing online resumes and other documents.

#### 6. Completing the Implementation of the PeopleSoft Student Administration System to Support the Curriculum Planning and Advising Process in All Areas of the University

Duke is completing the successful initial implementation of the PeopleSoft Student Administration System this academic year. Admissions, financial aid, registration, and student billing processes are now being conducted through the PeopleSoft system. For the first time, all student information is held in a common database. The project has added a number of web access features for students, faculty, and staff allowing ready access to information appropriate to each viewer. The University has migrated from a telephone registration system to a system based on web technology and PeopleSoft.

The Office of Student Information Services and Systems (SISS), in close cooperation with OIT and administrators in each of the schools and central offices, is responsible for building consensus on the structure and use of student data and for the continuous evolution of Duke's implementation of the PeopleSoft system. Improvements will involve refinements to both functionality and technical architecture as well as implementation of future upgrades. The SISS team will continue to work closely with students, faculty, and staff to develop and implement work and systems processes that will best support our academic programs.

In addition to supporting transaction processing and sophisticated reporting, the PeopleSoft system can be configured to support curriculum planning and advising from student, faculty, and academic administrative perspectives. As well as supporting the roll out of Curriculum 2000, system development will include planning, advising, and tracking progress toward degrees for the multiple graduate and professional programs and several non-traditional programs. Many distinct departmental and school academic milestones were not maintained in the central legacy systems. It is expected that these data elements and processes will be captured and supported in PeopleSoft during the course of this academic year. Web development along with the expansion of the system's advising tools will allow students and faculty to access this information easily.

#### 7. Completing the Implementation of the SAP HR/Payroll Modules to Support Faculty Information and Reporting Needs and Provide Data to Other Systems

Duke's SAP implementation has provided many rich financial and operational support tools for the University. As Duke implements the human resources and payroll modules, the SAP system will provide a central source of faculty and other employee data. The data will be used to provide common and consistent information to feed other systems around the University. We will explore the range of functionality provided in SAP in support of maintaining faculty data. We will continue our efforts in making SAP financial analysis tools available to our schools and departments. We will continue to

export data from all SAP modules to other systems and will build on our pilot efforts to develop data marts where a wide range of university reporting may take place.

## **F. The Duke University Press**

The goals and plans of the Press are closely aligned with the University's goals and plans, primarily in the humanities and social sciences. (To add a substantial scientific publishing program would require a new level of support for the Press, at least in the short term.) By publishing more than 100 books each year and more than 30 journals, in areas in which commercial publishers do not and cannot publish well, the Press supports the University's commitments to "advance the frontiers of knowledge and contribute boldly to the international community of scholarship" and to "promote a deep and sympathetic understanding of the range of human difference and potential, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom, and truth." Like Duke as a whole, the Press must make wise choices because of its relatively young program, modest size, and limited set of resources as compared to the best-established university presses, but its will to succeed and willingness to experiment have pushed it in the last few years to a position among the top presses. Many of the Press's innovations have been forerunners of the University's current vision, in such areas as interdisciplinarity, globalization, and promotion of diversity. The Press has every intention of continuing its growth, both in scope and in reputation, in the coming period; and it intends to do that in ways that further enhance its contribution to the University's vision for the future.

In support of the University's strategic initiatives, the Press will:

- Continue to forge strong and mutually advantageous links with the John Hope Franklin Center for Interdisciplinary and International Studies, the Seminars in the Franklin Institute for Interdisciplinary Studies, and related efforts as they develop;
- Explore joint publishing programs with other strategic initiatives, particularly Child Health and Policy, Environmental Solutions, Information Science and Information Studies, and Integration of the Arts—all of which fit well in some way with current Press publishing programs;
- Extend even further the Press's international visibility, in support of the University's goal to extend its global reach and influence;
- Support goals for faculty recruitment/retention in the humanities and social sciences by building close ties to key faculty in these areas, allowing them to help shape their fields nationally and internationally as well as locally and to achieve the desired recognition and visibility;
- Develop programs such as internships that extend and formalize the Press's outreach to and training for Duke students interested in publishing careers;
- Continue to emphasize multi- and interdisciplinary work—an area in which the Press has been a pioneer both at Duke and in the publishing community;

- Link our publishing programs with existing and proposed multidisciplinary programs in the humanities and social sciences such as Americas Studies, African/African-American Studies, and Women's Studies;
- Continue to publish strongly on issues related to globalization and its effects, including the move beyond area studies in academic thinking;
- Continue to publish strongly on issues related to the valuing of diversity, on dimensions that include racial, sexual, ethnic, class, religious, and cultural differences;
- Provide expertise to the university community on matters of intellectual property and scholarly communication in an age of evolving technologies.

## **II. Support for Duke's Workforce**

### **A. Human Resources**

Human Resources supports the recruitment, development, and retention of a well-qualified support staff that supports the University's teaching, research, and patient care missions.

As Duke undertakes ambitious goals ranging from building excellent faculty in every school to increased integration and collaboration in teaching, learning, and research, the need for a skilled, highly productive, and service-oriented workforce will only increase.

Duke's Human Resource Program is undergoing major restructuring to respond to the people-management challenges that emerged in the decade of the 90s. These complex human resource management circumstances were brought on by numerous factors, including dramatic shifts in workforce demographics; demands for new skills in technology; emphasis on customer service and problem solving; declining supplies of needed labor; and pressures for improved productivity. To ensure support for the academic plan of the University, Human Resources will be undertaking key strategies and initiatives in the following areas:

- Development of a supportive work culture for contemporary human resource practices;
- Strengthening systems and infrastructure that support staff hiring, development, and retention;
- Recognizing differences of operating units and business drivers across Duke;
- Developing a service culture in delivering resources.

Initiatives in each of these areas are described below:

## 1. Work Culture

To attract, retain, and ensure a well-qualified, productive, and service-oriented staff, the work culture must be respectful and supportive, while providing generous and exciting opportunities for employees to contribute, learn, and grow. The Duke workforce, like those in many other organizations, is multi-dimensional, including employees of various generations, cultures, skills, and races. The very best organizations recognize the benefits and value of a diverse workforce, and provide for the alignment and integration of individual and organizational needs.

Because of the low level of unemployment locally (2.4% in 2000) as well as a low national unemployment rate (4%) and a high demand for many critical skills (technology, customer service, teamwork, patient care), well-qualified employees have numerous options to start or continue a career. In the Research Triangle area, Duke faces employment competition from some of the nation's most notable and progressive employers. While pay and benefits are critical elements of the employment relationship, quality of work life, and the "value proposition" that employers offer to both attract and retain employees, require that Duke develop and maintain a supportive work culture. Given the ambitious goals for faculty expansion and faculty excellence in every school, these faculty will be dependent on superbly qualified, productive, and committed support staff. Furthermore, the skills, capabilities, and commitment of these staff members to deliver high-quality, cost-effective services have direct bearing on the attainment of goals for the Academic Plan as well as the overall reputation and effectiveness of Duke. To help strengthen and ensure a supportive work culture, the following initiatives will be undertaken:

- **Compensation Systems**

The restructuring of Duke's present systems for valuing jobs and delivering pay will be undertaken. New systems architecture and performance incentives will emphasize simplicity, flexibility, and performance recognition. The first phase is to take place for the Health System by a review of job content and pay delivery structures with redesigned plans beginning in 2002. The study, with appropriate modifications, will be expanded to campus jobs in a second phase.

- **Management Competencies and Training**

Critical to successful employment relationships and a supportive work culture are the skills, competencies, and capabilities of supervisors and managers. People management responsibilities in today's world of work are enormously complex. A skills- and competency-based program, focused on Duke specific needs and critical competencies for managing people, will be available to and accessible by all Duke's supervisors and managers, both those presently supervising staff and those who aspire to supervisory roles. Pilot programs will be completed in early 2001 with Duke-wide rollout plans supporting information across Duke over a two-year period.

- **Career Development Planning**

Institutions of higher learning attract individuals motivated by learning. Work-related policies and resources developed during 2000 will aid and support learning, skill development, and the professional growth of Duke's workforce. Particular attention will be given to support learning and professional development in ways that will enhance the diversity of Duke's workforce. On-line systems will enable individual managers and employees to pursue independent career planning. Approved policies and professional development programs will be marketed aggressively.

- **Proactive Recruitment**

Duke cannot rely on a single strategy to meet future staffing requirements. Proactive recruitment strategies that seek out needed skills from available labor markets will be undertaken through a partnership between central recruitment staff and hiring managers. Specific goals should lead to aggressive strategies to present well-qualified and diverse applicant pools. Specific strategies to develop internal staff for "promotion from within" will be initiated for hard-to-fill job categories beginning in 2000.

- **New Employee Orientation**

Acculturating new employees so they understand, identify with, and support Duke's mission in education, research, and patient care is critical in establishing a foundation for successful performance. How we bring people into Duke and begin developing them says a great deal about how the workforce will respond subsequently. An integrated new employee orientation system that creates close partnership between hiring units and the central human resource department will be designed and implemented during 2000/2001.

- **Employee Recognition and Celebration**

Research on employee relations and productivity underscores the benefits that derive from making employees feel that they are recognized and valued. A variety of program resources and support will be provided to employing units to help them recognize their staff. Centralized events will be planned and delivered to effectively convey overall institutional regard, respect, and appreciation for staff contributions.

- **Human Resource Policies**

Policies should be one of the best and most effective conveyors of institutional culture. They are the behavioral descriptions that explain how managers and staff should expect to work together to achieve intended outcomes. Policies should reflect a supportive work culture and enable trusting and effective working relationships. All policies should be aimed at creating successful, productive, and trusting employment relationships. Existing policies are being restructured to reflect a contemporary and supportive work culture and relationship between supervisors and staff members. All

supervisors and staff members will be trained on policies and supporting procedures as part of the management/supervisory training begun in 2000. All policies should incorporate and advance both institutional values and accountabilities for individual and group behavior in carrying out the work of Duke.

- **Employee Voice**

Duke needs a well-skilled, committed, and intelligent workforce. To achieve the goals of the Academic Plan, the support staff needs to be engaged in the educational, research, and patient care missions. Engaging the workforce in the design and evaluation of the work culture, through focus groups, feedback discussions, task forces and surveys, so that resulting efforts meet the needs of both Duke and its employees, will be a central part of our Human Resource philosophy. People better support what they help create and improve. Employee and manager participation will regularly be included in policy and program design. Measuring the effectiveness of our work culture to ensure that it fulfills the intentions of institution and employees alike is central to measuring effectiveness of work itself. Regularized measurements and use of results to strengthen and change the work culture is an expected part of Duke's Human Resource Program Development work.

## 2. Systems Support

The delivery of services to faculty and staff in a cost effective, efficient, and timely manner requires a systematic approach. Much of the delivery of Human Resources services is related to data collection and transmission in such critical activities as selection, applicant tracking, benefits enrollment, and payroll processing. Further, collection and maintenance of data for planning, analysis, and decision-making requires that accurate, complete, and timely data be accessible to employees and hiring managers across Duke. To support the collection, processing, and accessibility of data, the following systems initiatives will be undertaken:

- **Core Business Processes**

The recruitment and employment of well-qualified and capable support staff entails core processes for announcing vacancies, tracking applicant flow-data used in selection, decision analysis, and affirmative action review, and enrolling selected individuals in benefits and payroll. While ensuring needed administrative approvals and budget monitoring, these processes will be streamlined to take advantage of technology and to ensure timely and accurate process completion.

- **Job Evaluation and Compensation Systems**

With a support staff of over 15,000, it is essential to have contemporary methods for defining work "job/position descriptions" for use in recruitment, career development planning, affirmative action monitoring, and performance planning and evaluation. While these systems need to support hiring managers and university initiatives for

acquiring and developing its human resources, they must also be efficient to administer and readily explainable to those who utilize and are impacted by the system. Finally the systems should be flexible and responsive to diverse operating requirements and needs across Duke. Existing job evaluation and compensation delivery systems will be restructured to ensure efficient and effective operation and support of staffing requirements and positive employee relations of operating units. The University will engage a consulting firm to assist in the process of implementing a compensation system incorporating broadbanding and new job evaluation tools enabled by the SAP system.

- **Payroll Systems**

The routine delivery of timely and accurate paychecks is fundamental in meeting employee expectations as well as in planning for and managing financial commitments associated with pay and benefits. Work is presently underway to implement contemporary payroll and human resource data systems that support pay calculation of this quality.

### 3. Business Needs/Priorities

Operating requirements, program development priorities, and business considerations vary across Duke. It is no longer possible to have “one size fits all” relative to Human Resource policies, programs, and procedures. To the extent that differing approaches do not leave Duke at a disadvantage, particular or unique approaches to unit-specific recruitment, development, and retention strategies for staff will be considered.

### 4. Customer Service

The interdependencies across Duke for delivery of service to all constituencies are significant. We wish to establish and maintain a culture of respect, where responsiveness, follow-through, and meeting and exceeding customer needs will help distinguish Duke as an employer. This will also allow us to fulfill our educational, research, and patient-care missions. The following initiatives will be undertaken to advance Duke’s effectiveness in customer service:

- **Human Resource Information Center**

A single point of contact for HR transaction processing and information delivery will be established. HRIC staff will provide one-stop information services across the Duke community as well as externally.

- **Customer Service Training**

An array of skill-based workshops and resources will be available to all employees dedicated to developing an expert skill level in customer service.

- **Customer Service Accountability**

Customer service skills and performance will be a key item of accountability in performance management and evaluation systems.

- **Feedback**

Evaluation of customer service effectiveness will be a standard part of all initiatives and efforts by Human Resources. Feedback from customers will be used to improve and strengthen performance and to make needed changes going forward.

The expectations, requirements, and goals of the Academic Plan portray an ambitious and exciting future for Duke. A superbly qualified workforce enabled by a respectful and supportive work culture will effectively provide essential services in support of Duke's mission.

## **B. Office of Institutional Equity**

The mission of the Office for Institutional Equity (OIE) is to support and advance Duke University's commitment to diversity and its commitment to providing equal employment and educational opportunities to current and prospective staff, faculty, and students. Working in tandem with faculty and administrators, OIE can be of critical importance in fulfilling the goals of the Academic Strategic Plan.

OIE and Duke University recognize the value and importance of creating an academic environment in which individuals from diverse backgrounds interact. To create and sustain this atmosphere, community expertise and leadership in the areas of recruitment and diversity training will be of paramount importance.

In support of the University's mission, the Office for Institutional Equity is committed to providing professional leadership for the University in the development, implementation, and evaluation of university policies and practices regarding diversity, harassment, and non-discrimination matters. To substantiate our commitment, the Office for Institutional Equity provides consultation, training, and services in the following areas:

- Information, consultation, training, and resources for managers, faculty, staff, students, and the public, on issues relating to the provisions of the Americans with Disabilities Act;
- Information, consultation, assistance, and training for managers and Human Resources personnel regarding the University's Affirmative Action Program for Minorities and Women, Affirmative Action Plan for the Disabled, and other required federal, state, or local reporting data forms;
- Monitoring of updated reports regarding the University's Affirmative Action Report;
- Training programs regarding equity issues, diversity, and cross-cultural relations;

- Consultation services to individuals, managers, supervisors, and departments regarding diversity issues and harassment issues, including, but not limited to, workplace issues relating to race, disability, and harassment;
- Training and educational materials regarding Duke University's Harassment Policy, Americans with Disabilities Act, and equal employment/affirmative action;
- Implementation and monitoring of the University Harassment Policies.

In addition to the above, OIE will support the Academic Plan by:

### 1. Recruitment

- Continuing to participate in the Black Faculty Strategic Initiative, designed to identify African Americans for positions in which there is currently an under-utilization;
- Working with managers and hiring officers to develop recruitment strategies;
- Continuing our progress in developing a resource catalog of local and national minority and women professional organizations from which we can recruit (e.g. engineers, technical skilled workers, personnel administrators, student affairs personnel, etc.). Upon completion, this catalog will be available to hiring managers to assist them with identifying appropriate women and minority candidates;
- Consulting with faculty regarding identification of recruitment sources, including, but not limited to, historically Black colleges and universities and contacts and referrals from other educational institutions.

### 2. Retention

The Office for Institutional Equity recognizes the importance of retaining valued employees. Creating and maintaining a work environment free from prohibited discrimination and harassment are central to attracting and keeping employees who add to the richness and excellence of the University. OIE works in several other ways to support the retention of Duke employees, including:

- Working with departments and units that have identified individuals with potential and interest in professional development in such areas as health care providers, auxiliary services, and grounds;
- Providing training in diversity and harassment prevention in an effort to minimize attrition;
- Serving as a resource for complaint handling;
- Working with and supporting departments and units in developing mobility plans;
- Providing consultation to departments and units regarding the evaluation of current mobility plans;
- Assisting departments and units in compliance efforts to insure equal opportunity and access for advancement.

### 3. Training

Along with the Equity Institute and other established training programs, individualized and/or departmentalized curricula can be developed to assist managers and supervisors regarding issues of diversity, harassment, and compliance.

The Office for Institutional Equity will carry out its responsibilities by adhering to the following core values:

- Respect and diversity: We recognize and value individual and group differences, while recognizing and respecting similarities;
- Communication: We will maintain open and honest communication in our interactions with everyone;
- Knowledge: We constantly strive to learn more about our work and acknowledge that in this pursuit we sometimes need to seek additional information from other sources. When this need arises in our interactions with others, we will seek such information;
- Healthful environment: We pledge to do our part to ensure that Duke University is a place where individuals come together to work and learn in a non-harassing environment.

## **III. Support for Duke's Outreach**

### **A. Community Affairs**

#### **1. Reconfirming Our Commitment to Partnerships with Durham**

Both in *Shaping Our Future* and in this strategic plan, the university has given high priority to deepening its connections to and playing a constructive role as a responsible citizen in the life of the Research Triangle region and particularly our host city of Durham. *Shaping Our Future* called on Duke to improve the focus and coordination of programs with the Durham community and to strengthen internal and external communications about Duke's many relations with the community. Specifically, it identified the need to establish collaborations involving local government, community and neighborhood associations, and the private sector, as well as sister universities, to help address challenges facing Durham, with a special emphasis on neighborhoods near Duke's campus where large numbers of our employees live.

The plan also identified improving the performance of K-12 education as a special area of opportunity, and called on Duke to more systematically engage members of its faculty and staff in the public schools and in other programs where Duke expertise and resources could benefit Durham and its citizens. Finally, the plan stressed the need to establish our collaborations with Durham based on a climate of openness, trust, and respect. We reconfirm here our commitment to these goals outlined in *Shaping Our Future*.

## 2. Multiple Successes in Achieving Our Goals for Partnerships

Much has been done to build on the priorities identified for Duke and Durham in our earlier plan. In 1996 we created The Duke-Durham Neighborhood Partnership Initiative (NPI), which focuses on community partnerships to improve the quality of life of residents in 12 neighborhoods near Duke's campus as well as the seven public schools which serve them. The NPI includes two of the major low-wealth communities of Durham. The partnerships concentrates on issues identified as highest priority by neighborhood and school leaders, including improving K-12 education, expanding the supply of affordable housing, strengthening youth development and programming, helping achieve neighborhood stabilization, and reducing crime.

The number of student volunteers in the schools, as well as service learning opportunities for Duke students, have significantly expanded. Duke's Libraries have led efforts to train public school teachers in the effective use of technology in teaching and curriculum development. A partnership involving Duke Medical Center, the Durham Public Schools, Durham County, and Durham Regional Hospital has established a wellness clinic in one of our partner elementary schools.

Affordable housing and home ownership are keys to stabilizing low-income neighborhoods, and Duke has strengthened collaborations with the City of Durham, the Self-Help Credit Union, and Habitat for Humanity. More than 60 affordable houses have been, or are scheduled to be, built or rehabilitated in Walltown, a large number of which are now owned by Duke employees.

Duke has also developed partnerships with the faith communities in these neighborhoods. The university is collaborating with the St. James Baptist Church and Family Life Center, Calvary Ministries Inc. and its Community Family Life and Recreation Center at Lyon Park, and Walltown Neighborhood Ministries, a coalition of five churches and Duke's Divinity School.

While the Neighborhood Partnership Initiative has been and will continue to be the principal focus of Duke's collaborations with the Durham community, Duke has also worked closely with city planning officials, the private sector, and nonprofit groups committed to revitalizing downtown Durham and we will continue to do so.

## 3. Building on a Strong Foundation for Future Collaborations

As the previous information makes clear, Duke has been aggressive in developing partnerships with Durham, particularly through the NPI. Several administrative units at Duke – most notably Facilities Management, Information Technology, the Community Service Center -- and a number of academic units including the Divinity School, Duke Libraries, The Kenan Institute for Ethics, The Program in Education, and the Sanford Institute of Public Policy – have been active partners in supporting the NPI. There has been some progress in improving communications with internal and external audiences about the multiple ways in which Duke is engaged as a constructive citizen of Durham,

most notably the reports on Duke's economic impact on the community and increased positive coverage in local papers of the work of the Neighborhood Partnership Initiative. However, many people at Duke and in Durham are still unaware of these collaborations, thus depriving both employees and neighborhood residents of the benefits of increased interaction.

Duke's plans for future development of our relationships with Durham include the following:

- Increase involvement and engagement of Duke's schools and the medical center, as well as greater numbers of faculty, staff, and students in the NPI as a university-wide commitment, including incentives for participation. This will require the university to significantly improve internal communication and to further develop its coordination of programs to address Durham's challenges and opportunities;
- Continue to develop a focused set of collaborative programs with neighborhoods near Duke's campus and the public schools that serve them, to include:
  - Continue Duke's commitment to investment in affordable housing, with a goal of expanding the stock of owner-occupied, affordable housing in the Walltown and West End neighborhoods by .5 percent a year over the next ten years;
  - Develop a plan in cooperation with other partners, including the Burch Avenue, West End, and Walltown communities, to utilize the soon-to-be-vacant Medical Center laundry in Burch Avenue as a potential community resource, with a possible focus on senior citizens;
  - Facilitate the development and implementation of a comprehensive, consensus-derived, grassroots quality of life plan for the Southwest Central (West End) community, aimed at fostering greater collaboration, program integration, and resource-sharing among nonprofit primary service providers and churches in the West End. The plan will identify goals for affordable housing, crime reduction, health care, youth programming, job training, literacy, and support for the emerging Latino population, as well as steps to achieve them;
  - Develop pilot projects in the West End and Walltown communities in conjunction with the Durham Public Schools for collaborative after-school programs, focusing on students at risk; develop and implement programs which capitalize on the untapped potential for neighborhood-based community centers to serve as a venue for linking community-school support of children;
  - Continue to facilitate and support efforts of faith organizations, such as Walltown Neighborhood Ministries, in their efforts to empower their communities;

- Achieve greater involvement of government agencies – local, state, and federal – as partners in emerging NPI programs.
- Strengthen service-learning as an integral component of academic programs, with an appropriate reward structure; the goal will be to double the number of Duke students involved in service-learning over a five-year period
- Achieve the \$10 million goal to support NPI programs in The Campaign for Duke and developing permanent funding to cover costs of the expanded community relations core staff who have been critical to the success of the NPI;
- Continuing to have mutual trust, community empowerment, and collaboration be the cornerstone of Duke’s relations with the Durham community.

## **B. Alumni Affairs**

In conjunction with Duke’s academic planning process, the Duke Alumni Association has undertaken a strategic planning process of its own to examine its contributions to the University and to define the future of the organization. The Duke Alumni Association (DAA) supports the goals of the University and cultivates rich, lifelong friendships and partnerships among its alumni. It also advocates a larger concept of the university, one that reaches beyond the immediate campus community to encompass friends and supporters around the world. The mission statement of the Duke Alumni Association reflects these values:

**The mission of the Duke Alumni Association is to advance the interests of Duke University and to create opportunities for alumni to participate fully in the life and vitality of the global university community.**

In a time of changing dynamics and social culture, opportunities to connect the alumni community to the University are affording greater possibilities than ever before. Emerging technologies are bringing rapid change to the university environment and offer the means to provide new services to engage Duke’s various constituencies. As the DAA and Alumni Office work to meet these challenges, we must continue to assess priorities and determine strategies that will carry us forward. These goals have been identified as our major directive for the next five years:

- Increase alumni participation in the life of the University;
- Enhance the role of the Duke Alumni Association and the Alumni Office within the campus community;
- Evaluate and enhance the communications capabilities of the Duke Alumni Association.

As the Association and Alumni Office work to achieve these goals, we remain committed to continuing a tradition of excellence in programming and services and to preserving the unique culture of Duke University.

### 1. Increase Alumni Participation in the Life of the University

The highest priority of the Duke Alumni Association remains the fostering of lifelong relationships between Duke University and its community of alumni. That community has grown through the years, with new voices and new needs to address. The DAA's nationally recognized programs must continue to evolve to meet those changing needs. Volunteers are critical to our progress; the value they have to the association and the University should be recognized, and each volunteer should feel fulfilled by the experience.

While current programs enjoy ongoing success, it is essential that we continue to seek opportunities to involve our growing numbers. Eighty percent of Duke alumni live outside of North Carolina; a regional focus is imperative to the Association's mission and generates the broadest possible participation. On-campus programming is another cornerstone, bringing alumni back to their alma mater and strengthening their connections to the university community of which they are a vital part. As alumni-in-residence, Duke's undergraduate, graduate, and professional students have important roles to play in the association and must be engaged at every level.

### 2. Enhance the Role of the Duke Alumni Association and the Alumni Office within the Campus Community

As vital partners in the University's mission, the alumni association and alumni office staff should be fully integrated into the life of the University. Opportunities exist for greater interaction; they should be identified and explored to help Duke reach its goals.

The Duke Alumni Association board of directors connects the University to its 110,000 active alumni, and, through its leadership, Duke has access to a unique and powerful resource. The board, and thus the alumni body, can only benefit from the communication that results from greater interaction with administration and faculty. In turn, strengthening these relationships will do much to further the goals of the institution.

### 3. Evaluate and Enhance the Communications Capabilities of the Duke Alumni Association

New technologies are redefining every aspect of university life. The Duke Alumni Association's charge is to harness these emerging technologies to give alumni different means of connection to the University and to each other.

Building a wholly interactive electronic community will be required to reach alumni in a new information age. An additional challenge is to turn new mediums into

means of personal contact, shaping services and content to each member of the community. At the same time, traditional approaches must continue to be strengthened to serve alumni with more limited technological capabilities.

Properly explored and implemented, technology offers many opportunities, allowing the DAA to transform traditional programs and create new ones to broaden its reach. The Alumni Association and Alumni Office staff can best support Duke and its alumni by taking advantage of the technological revolution.

In the next five years, the Duke Alumni Association faces a number of challenges and opportunities. This plan takes a significant step toward understanding these issues and addressing them in a creative, thoughtful, and determined manner. Its successful implementation will serve our alumni and advance the University's outreach, helping to secure Duke's future.

### **C. Technology Transfer**

The Office of Science and Technology is responsible for licensing and start-up activity university-wide as well as for corporate research, relations, and gifts for the School of Medicine and the Duke University Health System. The Office therefore serves as the institutional interface with the corporate world for virtually every University/corporate interaction.

To date, the Office has focused primarily on the corporate front. Duke is also among the top twenty universities in venture activity, having launched a dozen companies with Duke or Duke-related technology over the past two years. Licensing activity as measured by licensing revenue has lagged behind the above efforts, but our number of active patents and licenses is strong relative to our peers, and we expect a significant increase in revenue over the next few years.

While the above activities have been largely focused on the Medical School due both to the preponderance of campus-wide research activity (>80%) located there and the location of the office, we believe that, going forward, we can aggressively expand the University's role. In doing so, we will support many of the new initiatives proposed in the academic plan for the science and technology arenas.

A first step is to utilize Medical School relationships for university-wide benefit. This would necessitate more closely integrating activities related to corporate support on the University side with Medical School relationships. This is especially applicable to the biomedical area, where we can leverage pre-existing research and vending relationships. A good example of an opportunity of this sort is the potential for expansion of ongoing relationships with the pharmaceutical industry in support of Genetics in the Medical School, a function key to both the University Program in Genetics and the Genomics Institute. In addition, efforts are already underway with new corporate relationships as well as support for the Center for Chemical Biology and the Institute for Genome Sciences and Policy, both University/Medical School programs.

The second step is to invest in additional resources for a more proactive approach to faculty. As OST responsibilities and administrative load have grown, the Office is no longer able to engage faculty at an early stage of technology development to discuss potential intellectual property and/or commercial opportunities that exist in their research. The Office is now at about one-quarter of staffing for licensing-related functions relative to comparable offices at peer institutions. The present level of staffing will not be able to support the new initiatives being generated in the University especially in the School of Engineering. This becomes an even more critical issue if the University intends to be more aggressive in the development of large-scale corporate relationships.

Opportunities within the School of Engineering represent a specific challenge to current OST staffing levels. The potential is great if OST is equipped with the internal resources to leverage the initiative in photonics in particular. This initiative holds great prospects for developing major commercial opportunities ranging from licensing activities to new venture activities and the development of research and educational relationships with everything from multi-billion dollar corporations to recent start-ups.

The third step is to creatively explore ways to encourage entrepreneurial activity at Duke. While we are developing new companies at a good rate, we need to explore ways to further enhance this important activity. Mechanisms to support early stage “translational” research, more aggressive faculty support initiatives, and the exploration of increased links to venture capital should be encouraged. One should note that there are already initiatives underway in the above areas, and these must be supported and brought to fruition.

A fourth step involves the exploration of commercial relationships abroad. For example, Duke’s developing international relationship with the Economic Development Board of Singapore offers the opportunity to expand commercial interactions within the context of our educational and research partnerships.

In summary, we believe we are poised to expand our activities in licensing and venture and corporate relations at the university-wide level to fully garner the benefits of our intellectual capital for the ultimate needs of society.

#### **D. The Duke Forest**

Since 1931, the Duke Forest has provided teaching and research opportunities for Duke faculty and students in the fields of forestry, botany, zoology, and, now, a growing array of environmental sciences. Today, the Forest is utilized by local universities and schools, as well as many other organizations nationwide, to study natural resource and environmental science issues. These uses range from classroom instruction to long-term research and demonstration on such topics as plant ecology, invertebrate zoology, forest economics, and global climate change.

The Duke Forest is recognized nationally as a premier facility for outdoor education and environmental science in the Southeastern United States.

In support of the University's strategic initiatives, the management of the Duke Forest will:

- Support inter- and multidisciplinary research and educational projects by providing maps, background materials, and assistance with selection and preparation of teaching and research sites.
- Manage and improve the Forest-Community interface. Although the Forest's mission is primarily to serve the educational and research needs of the University, members of the public have enjoyed limited recreational use of The Forest since its establishment. In addition, as urban boundaries have grown and as housing has developed near the Forest perimeter, more members of the public share the Forest environment. We will continue to work with the local community and governing bodies on issues that intersect the Forest.
- Improve standards for maintenance of research sites, forest roads, boundary lines, and timber stands. Stewardship of the Forest's natural resources will demand attention to environmentally and economically responsible practices in all aspects of the Forest's management.
- Link the management of the Forest to the University's overall capital asset planning. The Forest is one of the University's greatest (and largest) capital assets. As such, it will be included in the University's capital planning activities to ensure proper stewardship in the short- and long-term.
- Ensure the continued maintenance of the Forest by procuring incremental funding, including grants and contracts as well as endowment. While revenue from management of timber resources has historically been a primary source of Forest funding, new sources of revenue will be needed to promote continued development of the Forest.

## PART FIVE

### FACILITIES MANAGEMENT AND NEW FACILITIES INVESTMENTS

Early in our planning discussions, as we affirmed our ambitions and established preliminary goals, it became clear that this plan would need to address a number of major facilities issues. When *Shaping Our Future* was prepared during the 1993/94 academic year, several new academic facilities were just coming on line, including the Levine Science Research Center, the Medical Sciences Research Building, the Sanford Institute of Public Policy Studies, and the Law School addition. The relatively somber economic outlook that formed the backdrop for *Shaping Our Future* suggested that the university would be in a period of programmatic consolidation rather than expansion for the foreseeable future—“growth by substitution” was a dominant theme. In light of the recent construction and limited expectations for program development, significant new academic facilities were not on the planning agenda established in the mid-90s and did not appear in the goals for the Campaign.<sup>9</sup>

In the intervening years, we have been able to support programmatic growth beyond our original expectations. The buoyant economy and stronger federal commitment to higher education and funded research proved our original predictions wrong and have strengthened both our philanthropic support and our research base. The Board approved an expansion of the Arts and Sciences faculty supported by a two-tier tuition increase program and early Campaign proceeds. The Fuqua School of Business has expanded into global markets, becoming one of the premier international business schools. The Divinity School has launched new programs of local, regional, and national significance. Even as the health-care industry has evolved rapidly, creating new patterns of support for academic medical centers, federal and private support for basic and clinical research is at an all-time high, and slated to increase further. More generally, as this plan demonstrates, the opportunities for intellectual engagement and social impact are exceptionally high in science and technology fields, and we are committing ourselves to being major contributors in these areas, with major investments in the Pratt School of Engineering and in the core scientific fields in Arts and Sciences.

Our academic facilities did not keep pace with the programmatic expansion that took place in the latter part of the 90s. It is essential that we address the pent-up demand that has been created. We currently have essential programs that are too cramped and crowded to be effective, and we have activities that are split across locations, in a number of cases in off-campus rented facilities, that would be much more effective joined together. In the sciences, as series of recent external reviews makes abundantly clear, our ability to hire the most promising and productive researchers is severely compromised by the scale and quality of our research facilities. In addition, we are forgoing many

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<sup>9</sup> The original campaign goal did include support for the Perkins library renovations, the Center for Jewish Life, a new student recreation center, an art museum and new facilities for Duke Gardens. The CJL and the Wilson Recreation Center have been completed. The new Duke Gardens Visitors Center and greenhouses are nearing completion, and fundraising for both the Nasher Museum of Art and Perkins Library renovations is in full swing.

opportunities, particularly among our most productive researchers, for lack of space. Only two significant academic facilities have been completed since the mid-90s: The Magat Academic Center at the Fuqua School of Business, which opened in the Spring of 2000, providing an additional 62,000 square feet of office and classroom space; and the 12,600 gsf addition to the Free Electron Laser Lab, expanding biomedical research capabilities with the support of the Keck Foundation. A number of small-scale renovations were undertaken during this period, such as setting up the new cognitive neurosciences program in the LSRC, but there were no projects comparable to the total renovation of the Carr Building on East Campus in the early 90s.

## **I. Facilities Management Initiatives**

We are approaching our space planning needs on several coordinated levels, based on the foundations of the Duke University Master Plan completed last spring, the report of the Working Group on Space Allocation, Facilities and Capital Budgeting created by the Provost as part of the planning process, and the facilities needs that have emerged from our school-based and interdisciplinary program planning. With approval of the plan and creation of the Master Plan Oversight Committee chaired by the executive vice president, we have a clear framework for moving our facilities planning forward. The Working Group on Space Allocation, Facilities and Capital Budgeting<sup>10</sup> examined a range of issues involving the management of space (information systems, incentives for efficient space utilization, and space allocation standards and priority principles) and its renewal (maintenance and capital budgeting). The group concluded that although space is an essential resource in supporting academic excellence, our principles, procedures, and systems are not nearly as well developed for managing space as they are for managing our fiscal resources. A number of specific recommendations are being implemented to improve the effectiveness of our space allocation and facilities management processes. These steps include establishing space standards, rolling out a space management information system to schools and other major administrative areas, and increasing our annual funding for facilities upkeep and renewal. These recommendations converge with those of the Strategic Plan for Duke Research,<sup>11</sup> which recommends clearer guidelines and incentive structures for managing our valuable research space. We are currently recruiting an associate vice president for capital assets in a new position, which will play a key role in these activities as well as other facets of our real estate and capital assets portfolio, including management of the Duke Forest and the Washington Duke Inn.

## **II. New Facilities Investments**

No matter how much we improve our management systems, we need to make major facilities investments to support the academic plan developed in this report. The

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<sup>10</sup> An executive summary of the Working Group's report is included in the Appendix.

<sup>11</sup> An executive summary of the Strategic Plan for Duke Research is included in the Appendix.

major projects that have been developed through our planning process are discussed briefly below, in thematic academic groupings. Financial projections of both capital costs and incremental operating expenses have included in our budget planning and in the Strategic Investment Plan are summarized later in Part Six.

## **A. Science and Engineering**

The need for significant facilities investment is most acute in sciences and engineering, fields in which we are setting sights much higher than ever before with a concomitant need to increase not only the quantity of our academic space but also its overall quality. We are currently stymied in our efforts to recruit top faculty by the condition of our facilities, especially in biology and chemistry, which signal that we are not prepared to support world-class research. In this area, we need to proceed boldly but strategically. Already, several major science and engineering projects essential to our strategic plan have received preliminary approval by the Board of Trustees:

### 1. The Center for Interdisciplinary Engineering and Applied Sciences

The Center for Interdisciplinary Engineering and Applied Sciences will provide space for the Pratt School of Engineering's photonics and communications initiative, materials engineering and material systems and expansion/decompression space for other engineering programs, particularly in biomedical engineering. This facility will house the university's interdisciplinary center in materials science, including a state of the art clean room.

240,000 square feet

\$77 million estimated project cost

Trustee approvals: 10/00 Site, Scope and Selection of Architect

### 2. The Center for Human Disease Models

The Center for Human Disease Models, as a key component of the Institute for Genome Sciences and Technology (IGSP), will bring together genome scientists whose work depends on disease models supported by transgenic mouse research. The facility will include medical research labs and sophisticated animal care facilities. Arts and Sciences researchers in the department of psychology-experimental who work on animal models will also be housed in this facility, vacating prime West Campus space and solving persistent compliance problems resulting from housing research animals in unsuitable space.

122,000 square feet

\$41 million estimated project cost

Trustee approvals: 10/00 Construction Approval

### 3. The Center for Human Genetics

The Center for Human Genetics is another major component of the IGSP and has been created by the medical school to provide core resources and expertise in study design, database management, family and patient ascertainment, and statistical and molecular analysis necessary to carry out large-scale genetic analysis of human patient populations. This multidisciplinary approach to dissecting complex disease requires contiguous space for genetics researchers to interact easily in order to utilize the varied expertise of the faculty. Researchers are currently housed in four separate buildings.

120,000 square feet

\$35 million estimated project cost

Trustee approvals: 12/00 Design Approval

In addition to these projects, which are in very advanced stages of planning, several additional projects must be undertaken to support our goals in the science and engineering fields. For these projects we have only preliminary estimates of scope, costs, and timing. We have engaged a consultant in science space programming and planning to help us plan these projects, particularly in Arts and Sciences, in a coordinated way and to determine the best mix of new construction and renovation. These additional projects will include:

### 4. A New Facility for the Institute for Genome Science and Policy

This facility will house the Director of the university-wide IGSP initiative, as well as the Center for Genome Technology and the Center for Bioinformatics and Computational Biology. The facility will also provide space for some of the activities of the Center for Genome Ethics, Law and Policy, which will be housed principally in the proposed expansion of the Sanford Institute (see below).

The Center for Genome Technology, established in 1999 by the School of Medicine, is the home for investigators actively engaged in the development of new and novel approaches to genome analysis through technology enhancement and development. The Center also provides support for Duke investigators in the application of these technologies for their research. In addition to the School of Medicine, the Pratt School of Engineering and the Department of Chemistry in Arts and Sciences will be critical parts of the Center for Genome Technology.

The Center for Bioinformatics and Computational Biology will involve both Arts and Sciences (computational biology and the Institute of Statistics and Decision Sciences) and the School of Medicine. The Center will conduct analyses of massive quantities of genome-related data. Our ability to develop new programs that build a bridge between traditional analytical disciplines such as mathematics, statistics, computer science and the genome analysis component of the new biology will be an absolutely essential part of the success of the IGSP.

120,000 square feet  
\$40 million estimated project cost  
Trustee approvals: None yet sought

#### 5. A New Science Research Facility in Arts and Sciences

This facility will provide advanced research space to investigators in a variety of fields targeted in the plan, principally in biology and chemistry.

Square footage is undefined  
\$40 million estimated project cost  
Trustee approvals: None yet sought

#### 6. Major Renovations of the Biological Sciences Building and the Gross Chemistry Building in Arts and Sciences

Both the Biological Sciences Building and the Gross Chemistry Building are in need of substantial renovation. With the completion of a proposed new science research facility (see above), renovation of these older facilities will likely focus on office space and teaching laboratories.

Square footage is undefined  
\$15 million estimated project cost  
Trustee approvals: None yet sought

#### 7. Renovations to Hudson Hall in the Pratt School of Engineering

With the opening of the planned Center for Interdisciplinary Engineering and Applied Sciences (see above), renovations of the oldest parts of the PSE physical plant will begin, with emphasis on office and teaching space.

Square footage is undefined  
\$10 million estimated project cost  
Trustee approvals: None yet sought

### **B. Arts and Humanities**

In the arts and humanities, there are several facilities needs and projects. The renovation of Hanes Annex at a cost of approximately \$4.5 million to serve the new John Hope Franklin Center for Interdisciplinary Studies was recently completed. Additional projects in development include:

#### 1. The Nasher Art Museum

The Nasher Museum will house the Duke University Museum of Art, making

Duke's principal collections of original art available for education, scholarship, and public exhibition. The new museum will provide substantial new exhibition space and an auditorium for teaching and lectures involving the museum's collections. The East Campus space now housing the museum and shared with the Program in Literature will be available for other academic purposes.

45,000 square feet

\$15 million estimated project cost

Trustee approvals: 5/00 Site Scope and Selection of Architect

## 2. Performance and Studio Space Improvements

Beyond the Nasher Art Museum, the fine arts departments and programs at Duke require improved facilities. Several small- to medium-size projects will likely be undertaken to improve performance and studio space for students and faculty. The most specific proposal involves an addition to the Bryan Center to support and better utilize the major theatres there for academic purposes. In addition, we are investigating several options for acquiring and renovating space for performance practice and studio use.

Square footage is undefined

\$5 million estimated cost of multiple projects

Trustee approvals: None yet sought

## 3. Arts and Sciences Classroom and Office Renovations

Arts and humanities programs have substantial need for decompression, consolidation, and improvement in classroom and office space. The relocation of animal care facilities and researchers in the department of psychology: experimental to the new Center for Human Disease Models will provide one backfill opportunity. The relocation of the Art Museum to the new Nasher facility provides another. Although no specific assignments have been made, this space will likely serve the needs of arts and humanities departments.

Square footage is undefined

\$6.3 million estimated cost of multiple projects

Trustee approvals: None yet sought

## **C. Social Sciences**

In the social sciences, there is also a substantial need for decompression, consolidation, and support for interdisciplinary programs. We foresee meeting these needs for the immediate planning horizon through a single major investment, with the possibility of smaller backfill renovations and reallocations. The most important opportunity lies in an addition to the Terry Sanford Institute of Public Policy.

## 1. Sanford Institute Expansion

The Sanford Institute was completed in the fall of 1994 and provides approximately 53,000 gsf of outstanding space for teaching and research in the social sciences. The building was sited and designed to allow the construction of an additional wing in the future. We believe the time is right to move forward with this expansion and to house there a number of the key interdisciplinary social sciences initiatives discussed in the Plan, including the child and health policy initiatives, and the Center for Genome Ethics, Law and Policy. The building project is in the very early planning phase.

50,000+/- square feet

\$10 million estimated project cost

Trustee approvals: None yet sought

## **D. Professional Schools<sup>12</sup>**

The professional schools also face pressing space needs. The Law School completed a major addition in the early 90s and has reached full capacity in that facility. An additional renovation this past summer created adequate space for the short term; additional projects may be developed but are not part of our immediate plans. The Nicholas School of the Environment is housed in three locations. At the Marine Laboratory, we are expecting to move forward with a new Ocean Sciences Teaching Facility early in the planning period. Office and research space in the LSRC and the Old Chemistry building are under review; there are no immediate plans for expansion or substantial renovation. The Fuqua School of Business developed a comprehensive facilities master plan in the mid 90s and has been proceeding through a multi-phase program of renovation and expansion, most recently completing the Magat Academic Center. Construction of the Student Center will begin in the winter of 2001, and associated renovations are now underway. Significant renovations to the R. David Thomas Center, which provides accommodations for executive education programs and special events, is the next phase at a projected cost of \$7 million. An additional classroom and administration building is part of the master plan and may become an active project during this planning period. The Divinity School, which has substantially expanded the reach of its programmatic activity, has been developing plans for a major addition over several years and has received initial Trustee approvals to proceed. Finally, plans are being developed to expand School of Nursing facilities to support its strategic plan. The major projects highlighted in our investment plan are thus the following:

### 1. Fuqua School of Business Student Center

Consistent with the Fuqua master plan, this project involves new construction and renovations to improve office, classroom and student meeting space for business school

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<sup>12</sup> School of Medicine facilities are not covered comprehensively in this plan. See the section on Science and Engineering for facilities projects that are being jointly planned to support interdisciplinary programs that span the Medical School and other academic programs.

programs. In addition to providing a new focal point for students, the project will include additional faculty offices, and administrative service areas.

75,000 square feet (new) and 25,000 square feet (renovation)  
\$26 million estimated project cost  
Trustee approvals: 12/00 Construction Approval

## 2. R. David Thomas Center Renovation

An additional step in completing the Fuqua facilities master plan, with a focus on improving accommodations for overnight guests, which are currently below competitive standards.

Square footage is undefined  
\$7 million estimated project cost  
Trustee approvals: None yet sought

## 3. Divinity School Addition

This addition provides additional space for Divinity School programs, including a new chapel for student and faculty worship and accommodations for the Institute for Care at the End of Life.

40,000 square feet  
\$18 million estimated project cost  
Trustee approvals: 10/00 Site, Scope and Selection of Architect

## 4. School of Nursing Facilities Expansion

The School of Nursing is currently located in approximately 9,000 net square feet of space, primarily in the Hanes House Extension, and requires additional space over the next five years to support its strategic plan. Program and facility planning are now underway to determine the appropriate size of the additional space, and whether a new facility is needed or if expansion of the current facility is viable. The facility expansion will consist primarily of office space with a relatively small laboratory component.

Square footage is undefined  
\$10 million estimated project costs  
Trustee approvals: None yet sought

## **E. Libraries**

Planning for the space needs of the Perkins Library system has been under way for most of the 90s. Several significant but small-scale renovations have been completed, like the creation of a consolidated Special Collections Library within the Perkins

complex. In addition, several infrastructure issues have been addressed. Despite these improvements, major work remains to be done to make Perkins Library the vibrant intellectual center of the academic community it should be. A committee appointed by the Provost is now working with the Boston architectural firm Shepley, Bulfinch, Richardson, and Abbott to define a program of renovations and possible additions that will allow Perkins to meet the university's needs more adequately. A possible consolidation of science libraries is also under discussion in a preliminary way and will be considered further as part of our science space planning. A high-density offsite shelving and retrieval facility, the Library Service Center, is now under construction; completion of this facility next spring is a precondition to any significant changes to the Perkins complex.

### 1. Library Service Center

The first module of the Library Service Center (LSC) is now under construction on property purchased by the university near the Briggs Avenue exit from the Durham Freeway, about 15 minutes from campus. The heart of the LSC is a climate controlled, high-density storage facility that will allow the storage and rapid retrieval of library and archival materials for patrons. Additional modules may be added to accommodate future growth. In addition, the LSC may eventually house the Perkins Library technical services group responsible for acquisitions and cataloging.

22,000 square feet  
\$7.1 million estimated project cost  
Trustee approvals: 5/99 project approval

### 2. Perkins Library Renovations

Perkins Library needs substantial renovations to meet the requirements of a major research library in the 21<sup>st</sup> century. These renovations will take into account the multiple needs of students and faculty for information and materials in multiple formats (manuscript, print, digital) and for a correspondingly diverse array of services, work and study spaces that will support our academic objectives. Renovations will proceed in phases and are now being planned. Cost estimates are necessarily very preliminary but are based on preliminary planning studies undertaken over the last several years.

Square footage is undefined  
\$40 million estimated cost of multiple projects  
Trustee approvals: None yet sought

## **F. Student Life/Student Services**

The foremost project in the student life and student services area is the construction of new West Campus dormitory space through the West-Edens Link (WEL) project approved by the Board of Trustees in May 2000. A new student health facility in

Duke South is in the planning stages that will consolidate the student health outpatient services now in the Marshall Pickens Building on Erwin Road with the student infirmary already in Duke South. In addition, several projects for the Bryan Center and West Union are in the early planning stages that would provide expanded space for student organizations and student services. We expect also to address a longstanding need of the Office of Undergraduate Admissions by providing a large meeting room to host campus visitors. Outside the immediate scope of this discussion are a series of significant improvements to our recreation and athletics facilities, including the Wilson Recreation Center, the Schwarz-Butters Building, the Sheffield tennis facility, and the new football building now under construction.

### 1. West-Edens Link Residence Hall Project

The West-Edens Link project will expand West Campus housing capacity by 350 beds. This project will be followed by a program of systematic renovation of the West campus residences, using Trent Hall as swing space. When the renovation cycle is completed later in this decade, Trent Hall will be available for other purposes.

130,000 square feet  
\$39 million estimated project cost  
Trustee approvals: 5/00 Construction Approval

### 2. Bryan Center Addition

Preliminary studies have been completed to add an additional floor to the Bryan Center to provide additional student program space, one of the most pressing issues our students face.

30,000 square feet (approximate)  
\$10 million estimated project cost  
Trustee approvals: None yet sought

### 3. West Union Renovation

Preliminary studies have also been undertaken for the renovation of West Union, which would make additional prime West Campus space available for student administrative services (for example, Bursar/Registrar/Financial Aid) and/or Student Affairs needs.

Square footage is undefined  
\$10 million estimated project cost  
Trustee approvals: None yet sought

#### 4. Undergraduate Admissions Office Expansion

The Undergraduate Admissions Office hosts thousands of visits each year from prospective students and their parents. Duke has lacked a convenient, regularly accessible meeting room to accommodate the group information sessions that are an important feature of these campus visits. This has been a source of persistent dissatisfaction among our visitors and one we need to correct as part of our investments in more effective undergraduate recruiting. Several smaller renovation needs will be addressed at the same time.

Square footage is undefined  
\$2 million estimated project cost  
Trustee approvals: None yet sought

### **III. Deferred Maintenance Funding**

It is critically important that our facilities be adequately maintained. The university invests considerable sums annually on routine facilities maintenance. Facilities are also renewed through periodic, comprehensive renovations like several of the projects described above and through spot renovations to adapt space to changing programmatic configurations. An additional category of investment is “deferred maintenance,”<sup>13</sup> which provides for the replacement of major infrastructure systems (like chillers) or building components (for example, roofs). Recent analyses of our spending in these major infrastructure categories suggests that we are spending too little on these components. We therefore propose to increase deferred maintenance funding by \$5 million per year – or \$25 million over the five-year plan period -- as a central strategic initiative. Deferred maintenance funds are allocated to projects based on the severity of need and opportunities for synergy with other, program-driven renovation needs. Combining funds in this way is generally an economically efficient approach, and one that prevents renovation costs for particular program purposes becoming unmanageable because of broader infrastructure needs. With this additional funding, we expect to spend an average of approximately \$10.5 million per year, a figure we feel is appropriate to the condition of our facilities and our capacity to manage the projects while conducting normal operations. This source of funds also allows us to correct ADA deficiencies as we move from project to project.

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<sup>13</sup> The term “deferred maintenance” is somewhat misleading. It is based on the notion that universities often make use of buildings whose major components have outlived their theoretical useful lives and will therefore need overhaul or replacement. Universities live with substantial deferred maintenance backlogs, i.e. the value of the projects that would need to be undertaken to bring all components beyond their normal useful lives to “like new” condition. While backlog figures are not a useful or realistic guide to current project planning, they provide a salutary reminder of “what’s out there” in the future and impose a useful discipline in keeping careful records of the age and condition of major building components. This inventory of information can be assessed any time programmatic renovations are undertaken so that appropriate investments can also be made in underlying systems.

## **PART SIX**

### **STRATEGIC INVESTMENT PLAN**

Our planning has highlighted a number of ongoing priorities and critical new investments in programs and facilities that we must support financially if the Plan is to succeed. This part of the Plan describes our financial planning process and summarizes the financial strategy we expect to follow to finance our new investments. Once approved by the Board of Trustees as part Duke's long range plan, the Strategic Investment Plan will provide a blueprint for future resource development and allocation. Specific financial commitments for annual program expenses and individual capital projects will be determined by the senior officers in the course of the regular operating and capital budget processes and subject to normal Board review and approval through those processes. In addition, the Board will participate regularly in the assessment of the overall effectiveness of the Plan and its execution.

#### **A. Summary of the Financial Planning Process**

Financial planning has been a critical and integral component of our strategic planning. It has proceeded on several levels.

First, we examined the strengths and vulnerabilities of our major revenue streams; the results of this assessment were shared with the Board at its meetings in February 2000. Though our prospects are subject to perpetual review, we have concluded that the University is in a period of significant opportunity to build from its currently solid financial structure. Thanks to the strong demand for our educational programs, the success of The Campaign for Duke, Duke University Management Company's (DUMAC) investment performance, and the positive outlook for external research funding in areas where we project academic growth, Duke is well-positioned to make new strategic academic investments with considerable financial confidence.

Second, we reviewed and refined several institutional financial strategies that together generate substantial central funds under the President for coordinated strategic investments. A report on these strategic resources was provided to the Board in May 2000. These new resources are available for the first time to support the current planning process thanks to a coordinated set of financial strategies put in place since President Keohane's arrival at Duke; they are critically important not only because of the substantial sums they provide but also because they create greater central leverage in setting institutional priorities throughout our fundamentally decentralized, school-based budget system. In essence, we have created a revolving pool of strategic investment funds with continuing revenue streams that will enable this and future generations of Duke University leaders to invest in leading edge projects that promise a high academic or financial return and can become self-sustaining in the long run.

We currently expect university strategic investment funds to total at least \$160 million during the five year planning period through FY 2004/05, from the following sources:

- “Virtual Equity”<sup>14</sup> – \$105 million, including \$60million in hand at June 30, 2000 and expected additions of \$9 million annually;
- Strategic Investment Fund<sup>15</sup> – \$45 million;
- Uncommitted Unassigned Income<sup>16</sup> – \$10 million.

These already identified central resources, combined with substantial support from the Campaign for Duke, other academic resources and opportunities for bond financing, will provide tremendous leverage in financing the strategic investment plan.

The third prong of our financial planning strategy has been to develop and examine five-year budget planning models for each of the schools; to identify and address any fundamental issues in their financial structures; and to determine each school’s internal capacity for investment in its proposed new strategic investments through reallocation and development of new revenue resources. This process has demonstrated that all of our schools are actively managing their resources to build and sustain strength in current programs, to provide effective and efficient academic and administrative support services, and to identify resources for new priorities whenever possible, whether through reallocation or development of new resources. We found no

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<sup>14</sup> “Virtual Equity” is derived from deposits in the institutional reinvestment account (IRA) and depends on the spread between the IRA investment return and the rate paid to depositors. The University formed the IRA in 1994 as an “internal bank.” Equity is generated by paying depositors a rate equal to the 30-Day T-Bill, while investing the assets in longer-term vehicles which generate returns greater than the pay out rate to depositors (the target asset mix for investments is 25% long-term pool and 75% short-term account). The University can take dividends (i.e., discretionary income) when the equity generated exceeds 6% of the fund’s liabilities.

<sup>15</sup> In May 2000, the Board of Trustees approved a new spending rate and distribution structure. The total spending rate is 5.5% of the three year average of the calendar year end unit market value. Of this total rate, 4.25 points would be allocated to fund direct program costs (5.0% for financial aid accounts) and 1.25 points to the unrestricted budgets of schools and other major management entities to help defray the academic and administrative support and space costs associated with endowment-supported programs (0.5% for financial aid accounts). The unrestricted revenue freed up by the allocation of 1.25 points in this way (0.5 points for financial aid accounts) has been used to create new funds for strategic priorities. Strategic funds in each of the schools are allocated to deans’ priorities after approval by the provost and for the Schools of Medicine and Nursing, with the concurrence of the chancellor for health affairs. In addition, a central strategic funding resources has been created under the president for investment in central strategic initiatives.

<sup>16</sup> Unassigned income consists of interest income from the university’s working capital and internal overdrafts, unrestricted operating support from The Duke Endowment, and income from university unrestricted endowments. According to the policy announced by the senior officers in January 1997, all growth in university unassigned income above the FY 96/97 base will be allocated by the president for specific purposes and for specific terms.

substantial opportunities to eliminate or substantially curtail departments or programs during this process that would not undermine our commitment to maintaining and building upon established strengths. There is, however, an ongoing process of active reallocation toward new priorities evident most clearly in the annual reallocation of faculty slots to areas of greatest potential. We have strengthened this process through the proposed Provost’s Lines, which will promote an accelerated reallocation of faculty slots to the highest impact fields. We will continue to promote this process of effective management and ongoing reallocation through our regular processes for approving faculty search requests and annual budget proposals.

Finally, we have developed separate, detailed financial plans for each of our centrally funded strategic initiatives, detailing the sources and uses of funds for each initiative. These “academic investment proposals” have provided a framework for reviewing the cost structure of proposed investments and for examining the mix of resources that can be leveraged to support them, both short and long term. Resource requirements for academic investment proposals approved by the Provost and Senior Officers are reflected in the Strategic Investment Plan described more fully below. Facilities projects will also be included in the university capital budget, which will be presented in May.

## **B. Strategic Investment Plan**

The planning process has identified a set of specific investments where central support is critical to achieving the goals of the plan—in developing our faculty, improving our science and engineering programs, building effective interdisciplinary programs, deepening our technology, facilities, and other features of our academic infrastructure, and providing more effective educational programs for our students. Our strategic investment plan is the summation of these critical central investments that have been described elsewhere in this plan. The investment plan has been developed based on careful review of costs, resources, and priorities with substantial input from the Deans Cabinet, the Academic Priorities Committee, the President’s Advisory Committee on Resources, the Executive Committee of the Academic Council, and the Board of Trustees.

The Strategic Investment Plan is summarized in the table below. It includes the academic investment proposals and facilities projects that have been endorsed by the Senior Officers through the planning process for central support, including debt financing. The core operating budgets of the schools will also advance many strategic priorities that are not specifically accounted for here. The investment plan is organized with programmatic commitments on the left and facilities commitments on the right. The plan is further organized into thematic sections (“Arts and Humanities,” “Science and Engineering,” etc.) to group together related programmatic and facilities investments. (Note, however, that the programs and facilities on specific rows within sections do not necessarily relate to each other).

The Strategic Investment Plan calls for a total five year investment in the identified priorities of up to \$727.1 million, of which \$515.5 million is for facilities and \$161.6 million is for programs, and \$50 million is held for future opportunities and contingencies. Approximately \$271.1 million of the funds needed to finance the plan—about 38% of the total—have already been identified through school resources, fundraising commitments, and approved lending arrangements. Approximately \$456 million will come from other sources, including the central strategic resources described above, targeted fundraising, and tax exempt debt. We expect at least \$160 million of the needed funds will come from central strategic resources, approximately \$150 million from targeted fundraising, and the remainder—approximately \$146 million—from debt.<sup>17</sup> The assignment of specific resources to specific programs and capital projects will be worked out on a case by case basis. In general, unassigned income and strategic initiatives funding derived from the 50 basis point change in the endowment spending rate will be used to support programmatic initiatives. Virtual equity and debt will be used to support capital projects. Income derived from the Campaign for Duke could support either category. The following table provides a high level summary of the plan’s expenditure targets and funding sources:

**Table 1**  
**Summary of Central Strategic Investment Plan**  
*Millions of Dollars, FY 00/01 through FY 04/05*

<u>Expenditures</u>	<u>\$ Amount</u>	<u>Percent</u>
Program	161.6	22.2%
Facilities	515.5	70.9%
Future Opportunities and Contingency	50.0	6.9%
Total Expenditures	727.1	100.0%
 <u>Resources</u>		
School and External Commitments	271.1	37.3%
University Strategic Funds	160.0	22.0%
Targeted Fundraising	150.0	20.6%
Tax Exempt Debt	146.0	20.1%
Total Resources	727.1	100.0%

Our general expectation is that programmatic support from central funds will not continue beyond five years. Funding will shift either to external grants and contracts, new endowment income, or the budgets of the schools. Programmatic support is thus a form of bridge funding. Maintenance and operating costs of new facilities will be the responsibility of the schools; appropriate cost estimates have been included in their individual financial plans.

The Strategic Investment Plan will provide a touchstone in the implementation of the university’s strategic plan, providing a clear guide to priorities and a resource allocation blueprint for program support and capital projects. We have developed specific allocation and accountability guidelines for these funds to insure that investments

<sup>17</sup> In addition to this estimated \$150M to meet the priorities of the plan, approximately \$100M of new debt has already been approved by the Board for School of Medicine facilities and the new residence hall.

are carefully managed and directed to our specific strategic goals. This process will allow us to modify allocations in the light of demonstrated achievement and need. Allocation decisions will be incorporated into our ongoing operating and capital budget cycles, but central strategic investment funds will be separately identified and managed. The Board of Trustees will play a major role in this ongoing process through its regular reviews of budget issues and capital projects and through our specific reporting on the strategic plan that is part of the assessment framework described in Part Seven.

### **C. Risk Assessment and Contingency Planning**

The United States economy has been in a sustained boom—with continuing growth in our gross domestic product, full employment, low inflation, a soaring stock market, a federal budget surplus, and increasing personal incomes, especially for individuals with college degrees. These have also been good times for private research universities, with increasing numbers of better qualified applicants, rapidly growing endowments, substantial real increases in federal research and development expenditures, revived interest in federal student aid, and strong student demand for our programs. In recent years, the area of greatest concern has been the health care environment and its relationship to financial support for the broad functions of academic medicine. Duke has performed comparatively well in this changing arena, but we are devoting continuing high-level management attention to these issues.

We know that the positive factors so important to private universities over the last decade will change for the worse at some point (as we have already seen in the recent dampening of returns in U. S. equity markets), perhaps singly and perhaps in combination. Although the long-term prospects for the U. S. economy and for federal, corporate, and philanthropic funding for higher education remain excellent, we need to anticipate short-term challenges and ensure that we have the appropriate mechanisms to protect our core commitments, sustain our academic quality, and make headway on our strategic investment priorities.

Even as this phase of our planning process is drawing to a close, concerns about the short-term vitality of the U. S. economy have grown. Fortunately, we are well-positioned to meet the challenges of a slowing economy and continue our forward momentum. Our programs and revenue sources are diversified. Demand for our educational programs is strong and could increase in a slowing economy. We have a number of financial policies that are deliberately designed to protect us from downside risk, including an endowment spending policy that constrains spending in good times so that spending can continue in bad times; a conservative budget structure and debt posture; an interest rate stabilization reserve; and substantial operating reserves. This combination of market strength, fiscal soundness, and prudent financial mechanisms should enable us sustain our core strengths and preserve our forward momentum even in adverse conditions.

Our strategic investment plan is linked to a program of assessment and financial

checkpoints intended to keep us moving towards our strategic goals while guarding against over-commitments. Overall, we think we are likely to identify the needed resources to enable us to move forward with this program. At the same time, we are prepared to make the necessary midcourse corrections and tradeoffs (delaying, trimming, finding alternative revenue sources) that may be necessary should the resource outlook prove less favorable. We will revisit these issues often within the framework of our ongoing planning for our operating budget and capital program and our regular assessments of our progress in implementing the Plan.

<b>Table 2</b>			
<b>Duke University Strategic Investment Plan, FY 2000/01 through FY 2004/05</b>			
<b>Updated February 5, 2001</b>			
<b>All amounts are five year totals in millions of dollars.</b>			
<b>Programs</b>		<b>Facilities</b>	
<b>Description</b>	<b>Total Investment</b>	<b>Description</b>	<b>Total Investment</b>
<b>Arts and Humanities</b>	<b>6.6</b>	<b>Arts and Humanities</b>	<b>30.5</b>
John Hope Franklin Center and Institute	5.1	John Hope Franklin Center/Hanes Annex Renovation	4.2
Arts and Humanities Program Development Funds	1.5	Nasher Art Museum	15.0
		Performance/Studio Space Improvements	5.0
		A&S Classroom/Office Renovations	6.3
<b>Science and Engineering</b>	<b>77.3</b>	<b>Science and Engineering</b>	<b>261.0</b>
IGSP/A&S Programs	12.4	Center for Interdisciplinary Engineering and Applied Sciences	77.0
IGSP/SoM Programs	30.0	Hudson Hall Renovation	10.0
Nanoscience/A&S	8.0	IGSP/SoM Facilities	40.0
Materials Sciences – Shared Clean Room Facility	14.5	Center for Human Disease Models	41.0
Science and Engineering Research Institute (SERI)	3.6	Center for Human Genetics	35.0
Global Change	2.0	A&S Science Research Facility(s)	40.0
High Performance Computing	5.7	A&S Science Teaching Renovations	15.0
Neural Analysis and Engineering	1.1	Bio-Sci Renovation (Phase I)	3.0
<b>Social Sciences</b>	<b>8.8</b>	<b>Social Sciences</b>	<b>10.0</b>
Social Sciences Initiative/A&S	3.1	Sanford Institute Expansion	10.0
Child and Health Policy	2.5		
Environmental Solutions	2.1		
Micro-Incentives Research Center	1.1		
<b>Professional Schools</b>	<b>19.6</b>	<b>Professional Schools</b>	<b>64.5</b>
FSB – Faculty "Deepening" Initiatives	3.2	FSB – Student Center	26.0
FSB – Center for Excellence in Business Education	6.0	FSB – Thomas Center Renovation	7.0
Law – Faculty Development	6.4	Law – 4th Floor Renovation	2.0
NSOE – Faculty Development and Deepening	4.0	NSEES/DUML – Marine Sciences Teaching Facility	1.5
		Nursing – Facilities Placeholder	10.0
		Divinity – Addition	18.0
<b>Libraries</b>	<b>5.0</b>	<b>Libraries</b>	<b>47.1</b>
Perkins System Planning Initiatives	5.0	Library Service Center	7.1
		Perkins Library Renovations	40.0
<b>Information Technology</b>	<b>27.3</b>	<b>Information Technology</b>	<b>15.0</b>
Center for Instructional Technology	2.3	A&S Technology and Classroom Renovation Funding	15.0
Information Technology Investment Pool	25.0		
<b>Student Life/Student Services</b>	<b>4.5</b>	<b>Student Life/Student Services</b>	<b>62.5</b>
Student Affairs Programming Initiatives	2.0	WEL Residence Hall Project	39.0
Undergraduate Recruiting Initiatives – Admissions and Financial Aid Offices	2.5	Student Health Wellness Center	1.5
		Bryan Center Addition	10.0
		West Union Renovation	10.0
		Admissions Office – Large Group Meeting Room & Other Improvements	2.0
<b>University Wide Priorities</b>	<b>12.5</b>	<b>University Wide Priorities</b>	<b>25.0</b>
Black Faculty Recruiting Funds – Enhanced Funding	2.5	Deferred Maintenance Funding Increase	25.0
Provost's Lines	10.0		
<b>Total Investment</b>	<b>161.6</b>	<b>Total Investment</b>	<b>515.5</b>
<b>Other Sources Identified</b>	<b>(32.5)</b>	<b>Other Sources Identified</b>	<b>(238.7)</b>
<b>Campaign/Central Funding Need</b>	<b>129.1</b>	<b>Campaign/Central Funding Need</b>	<b>276.9</b>

## PART SEVEN

### IMPLEMENTATION AND ASSESSMENT

We have laid out in these pages a bold plan for Duke University to take a major step forward in excellence. We have stated nine ambitious goals and derived through the planning process a number of new initiatives and programs that we believe will provide the cornerstones of a significant advancement in the quality of teaching and research at our university. Attaining these goals will be a challenging task; we see both great opportunities and great risks. To ensure that we manage those risks effectively and maximize the impact of our investment of energy and resources, we will carefully develop strategies for implementing, benchmarking, and assessing our plan as it moves forward. In this, the final part of the Strategic Plan, we lay out the principles that will underlie these strategies and guide us as we move into the implementation phase.

#### **A. Implementation**

Many aspects of this plan are already preliminarily underway; others will phase in at appropriate times, driven by recruiting, fund raising, grant success, construction schedules and budgetary issues. The Provost, with the assistance of the Vice Provost for Academic Affairs, the Vice Provost for Finance and Administration, and other members of his staff, will have oversight responsibility for the University Plan. He will also consult regularly with the Senior Officers about progress in plan implementation and with the Board of Trustees according to an agreed upon schedule. The deans will have similar responsibility for implementation of their school plans, with oversight by the Provost.

Much of the implementation of the plan is focused on the initiatives described in Part Three. Supervisory responsibility for these rests with the Provost, and an appropriate member of his office will be assigned to each. In most cases an advisory committee - perhaps with members from outside the university—will also be set up and an outside review will be conducted at an appropriate point. Advisory committees will be charged initially with submitting full implementation plans that include a timeline, expectations, and criteria for assessment of the initiative. These plans will address the research programs, educational programs, partnerships, external support, and outreach components of the initiative. Additionally, provisions will be made for restructuring or phasing out the initiative if it is not meeting expectations. These plans will be individually reviewed and approved by the Provost and the deans.

Even though this plan primarily covers the next five-year period, it has implications for the next ten years and beyond. In particular, some of the proposed initiatives will not be in full swing until facilities are completed. A timeline is provided for implementation of the initiatives in Table I and for construction of the new facilities in Table II. These initiatives fall into three categories:

Programs That Are Already Underway In Preliminary Form:

- Institute for Genome Sciences and Policy
- Child Health and Policy
- Environmental Solutions
- John Hope Franklin Institute for Interdisciplinary Studies Research Initiatives
- Micro-Incentives Research Center

Programs For Which Planning Is Complete, That Will Commence Their Activities In Fall of 2001:

- Global Change
- Neural Analysis and Engineering
- Photonics and Communications

Programs That Await Further Final Planning Or Facilities:

- Information Sciences and Information Studies
- Fuller Integration of the Arts into the Academic Mission of the University
- Materials
- Science and Engineering Research Institute

**B. Assessment**

We will monitor our success in implementing the strategic plan by carefully watching:

- How close we match our timeline for initiation and completion of facilities and programs;
- How close we are to our cost estimates.

We will regularly update the faculty and the Board of Trustees on our progress on each of these issues.

The outcomes of this strategic plan will be judged by how well we do in reaching the goals set out in Part Two. We have developed University and school strategic indicators to help us monitor the “vital signs” of our academic programs. These indicators will capture the issues described below.

In addition, since we have placed a major emphasis on the success of the university-wide initiatives described in Part Three, we will have ongoing evaluations of these initiatives to see how well they are supporting our goals. Each initiative will have a steering committee charged with establishing clear guidelines for evaluating success. This committee will set up performance expectations, sunset clauses, and processes for regular review. Short-term indicators will be established and will be part of reviews.

Long-term indicators will be the contribution made to attaining our nine goals, so that each initiative will be judged by the criteria described below.

Here then are the primary issues that we will monitor in our ongoing assessment

### Expectations:

We expect to see some immediate impact on faculty quality in priority areas, simply because they are priorities. A clear statement that the University is committed to developing programs in a particular area is an important asset both in recruiting new faculty and in supporting the faculty that are already here. Sustained improvement in faculty quality, as measured more broadly, will take longer and we must think in terms of at least five to ten years before we will see dynamic improvement in all our faculty quality indicators. Nevertheless, this is our ultimate goal and we will settle for nothing short of this broad strengthening for our all of our faculty.

Midcourse adjustments will be key to our success. In the short term, we will be able to adjust our investments in facilities, initiatives, and other areas to assure their impact on the University. Longer term, however, we will need to revisit the strategic plan itself to continue to find the best mechanisms for continuing to build on the momentum that distinguishes Duke.

## **2. Research Funding**

### Importance:

As stated in Part Two, our first priority will always be to encourage and support research of the highest quality. This does not mean that we will develop programs or reward faculty success solely on the basis of funding, but we do seek to increase the percentage of campus research that is externally funded. We must increase our overall research productivity and our presence in areas that are both at the research frontiers *and* sustainable through external support. The planning report submitted by the Interim Vice Provost for Research raises a number of concerns in this area that must be addressed if we are to significantly strengthen science and engineering at Duke.

### Monitoring:

The Vice Provost for Research tracks campus-sponsored research and will carefully monitor both the number of eligible faculty that obtain external support and the total amount of that support. The deans and the Provost, working with the department chairs, will have the responsibility of ensuring that space, incremental salary and graduate student support bear an appropriate relationship to research productivity. We will especially monitor the research support of new faculty, as this is an excellent indicator of our progress towards bringing fundable and less- or non-fundable research into a more appropriate balance.

### Expectations:

We will expect to see a significant increase in external funding in priority areas. The strategic planning process has already led to a number of new proposals. In the

longer term, the key will be our success in faculty development and in changing the research culture on campus. It will be especially important to succeed in increasing the focus on multi-disciplinary research in parallel with funding trends.

As we monitor our success, we will be attentive to the use of internal seed funds to be sure that they have led to increased external funding. We will also use the information we obtain on funding to adapt our internal policies on space allocation, etc.

### **3. Undergraduate Research and Vertically Integrated Programs**

#### Importance:

We are strongly committed to the statement made in the opening sentence of the description of Goal 3:

“The strongest educational advantage offered by a research university is the ability to build the undergraduate experience on the scholarship of the faculty, and the best way to convey that scholarship is by exposing students to the research process underlying that scholarship.”

We believe that this is an area in which Duke can take a national leadership role. The creation of Curriculum 2000 is an important first step and we will monitor the success of its research component and make adjustments to ensure that undergraduate research becomes more of an integral part of the education process at the University. We also expect all new programmatic initiatives to make contributions to our curriculum, especially to undergraduate research experiences. The creation and expansion of vertically integrated programs on campus will also be a fundamental component of our strategy for better integrating teaching, learning, and research and will have a significant impact on the training of graduate students and young faculty as mentors, teachers, and researchers.

#### Monitoring:

The offices of the Deans of Arts and Sciences, Trinity College, and the Pratt School of Engineering will track NSF-funded research experiences for undergraduates, service learning that is research related, and other indicators of student research. The Provost’s office will monitor new curricular programs that emerge from the strategic initiatives, as these will be excellent areas for undergraduates to engage in research. Vertically integrated projects will have a significant undergraduate research component. While it will not be easy to monitor exactly which of our academic programs are truly vertically integrated, we will work to do so as much as possible. The Vice Provost for Academic Affairs will be responsible for encouraging this activity and for assessing our success in this area.

#### Expectations:

We expect to see a significant increase in undergraduate research as a result of establishing this priority as well as of improved mentoring. Certainly both Arts and Sciences and Engineering have been focusing major efforts in this direction for some time. Within five years, it will be reasonable to expect a doubling of the number of undergraduates who are engaged in a significant research project while at Duke and a significant increase in vertical integration.

#### **4. Diversity**

##### Importance:

We have stated in Part Two of this plan that we promote diversity at Duke because:

- Actively Engaging Such Diversity Is Essential to a Good Education;
- Diversity in Educational Experience also Prepares Students to Work with and Lead Diverse Groups of People; and
- We Wish to Attract the Best Talent to Duke, from All Possible Sources.

In order to ensure that we are doing our best to encourage diversity on campus, we will continue to carefully track the composition of our student bodies, faculty, and employees. We will also work both within and outside Curriculum 2000 (and its cross-cultural competency requirement) to encourage learning through diversity in all aspects of campus life, including mentoring, panel discussions, artistic performances, community-service opportunities, and social functions. Our students themselves have manifold creative programming ideas; we must provide them the appropriate resources—including physical space and funding—with which to put these ideas into action. We will also work aggressively to increase the number of underrepresented minority faculty across the campus and to increase the number of women faculty (of all races), particularly in the social sciences and natural sciences, and also in the Nicholas School of the Environment, Pratt School of Engineering, and Fuqua School of Business.

##### Monitoring:

Currently, we have several assessment measures at Duke. The Office of Institutional Equity prepares an annual report which tracks diversity among students, faculty, and staff. We will continue to support training programs that promote diversity, at every level. This year, we have also proposed changing our undergraduate admissions criteria in ways that should help to promote a more diverse student body. An annual report prepared by the Office of the Provost and delivered to Academic Council keeps tabs on our progress in the Strategic Plan for Black Faculty Development. Yet diversity cannot only come from the top down. In faculty hiring, we need to make sure that departments comply with EEOC regulations and that they forward their findings to the Office of Institutional Equity each year. We will also make sure that the Strategic Plan

for Black Faculty Development is not the only way that minority faculty are hired but that, in addition, underrepresented minorities and women of all races are part of all hiring pools. We will continue to tabulate and assess our progress or our lack of progress in all targeted areas.

Expectations:

Our primary expectations in this area are those set forward in the Black Faculty Strategic Initiative. It is difficult to predict how quickly we will make progress in this area, since there are a variety of factors outside of our control. In some areas, the pool is small and recruitment for the best faculty from the pool is extremely competitive. Yet a small pool must never dissuade us from pursuing ever more committed, creative, and energetic efforts toward diversity, as we also know that a diverse faculty helps to inspire greater student diversity.

## **5. The Effective Use of Information Technology**

Importance:

A major goal for Duke is the thorough integration of information technology into all appropriate aspects of university life. This includes the increased integration of IT into our teaching and research components as well as the development of academic programs that focus on information technology and its impact on society. These dual goals are summarized in the two programs we have proposed, CITIE and ISIS.

Monitoring:

Assessment must be a major component of both of these programs and will be worked out as they develop. The Provost's office, working where appropriate with the Office of Information Technology (OIT), will create benchmarks and a full assessment procedure before these projects begin in Fall 2002. As a first step, in Fall 2000, the Provost appointed a Special Assistant to develop a better IT strategy, and charged him with making a report in June that will form the basis for this assessment.

Expectations:

In terms of timing, we expect that the impact of CITIE will be immediate, as our commitment to requiring students to have computers will force a major effort to provide significantly increased support services for students and faculty. ISIS will take more time to develop, but we expect that the program will be in full swing by Fall 2002 and ready for serious assessment in 2004.

## **6. Student Life and Student Quality**

### Importance:

In our plan we have reaffirmed the importance of student life as a key ingredient in assuring the quality of the educational experience offered at the University. We have stated that the nurturing of personal and intellectual growth through the creation of a true learning community rests on three poles:

- Recruitment of an Intellectually Engaged and Multi-Dimensional Student Body;
- Reduction of Barriers to Interaction among Diverse Populations; and
- Attention to the Personal Well-Being of Every Student and a Healthy, Safe Learning Environment.

### Monitoring:

In order to assure that we move as effectively as possible in building the kind of community we have described, we will carefully track our admissions indicators; regularly assess the effectiveness of our support services; and monitor our success in making expectations for good advising, teaching, and mentoring a part of teaching expectations influencing salary, promotion, and tenure. COFHE indicators will be especially important in assessing undergraduate life on campus. Additionally, we will monitor our academic and social integrity policies and continue to track student and faculty attitudes on integrity issues, develop appropriate mechanisms for assessing learning environments outside the classroom, and check the progress on the concerns identified by the GPSC report and the task force survey.

### Expectations:

It will take some time to see significant improvement in recruiting undergraduate students, but we expect to see relatively immediate increases in the measures designed to assure improvements in recruitment along the lines outlined and to see preliminary evidence of their success (e.g., increases in applications and in desired qualities of the pool in relatively short order). We expect to see a concomitant evolution of campus culture toward a more inclusive and holistic community.

## **7. Internationalization**

### Importance:

Our responsibility at Duke is to furnish our students with the resources to meet the challenges of an increasingly interdependent world. Extending Duke's global reach and influence is a critical priority because Duke's relatively short history and relatively recent emergence as a comprehensive, international university mean that it has a smaller alumni

pool abroad and a greater challenge in projecting itself abroad than universities with which it is compared in the United States.

Monitoring:

The Vice Provost for International Affairs, working with the International Affairs Committee, will have the responsibility for monitoring our progress towards Goal 8. In particular, he will focus his efforts on assessing and monitoring partnerships; financial aid for international students; tuition and salary differentials; international student enrollments; study abroad programs; infrastructure support; and fundraising.

Expectations:

We expect to make measurable progress in all of the issues identified as priorities by the International Affairs Committee. In particular, we expect significant progress in providing financial aid for foreign students and in developing strategic partnerships with other international universities. The first of these will be critical in making us more competitive with our peers, allowing us to recruit some of the best foreign students and making it possible to have a more economically diverse population of foreign students. The latter, in conjunction with the former, will extend Duke's reach and influence worldwide. We expect efforts to further internationalize the university to be a continuing challenge far into the future.

## **8. Collaborations in the Triangle and Beyond**

Importance:

We believe strongly that in many areas we cannot attain the excellence this plan so strongly advocates without improving the coordination of our efforts with our neighboring institutions. We have therefore committed ourselves to reducing, where possible, the obstacles to this collaboration and to taking a leadership role in forging new joint programs in North Carolina and beyond.

Monitoring:

To monitor and assess improvements in this area, we will collect data on funding, partnerships, and other collaborations and will measure the cost of collaborative efforts with other institutions against the cost of running the program independently to determine if collaboration brings increased efficiencies. We may be able to continue programs that could not be successful without a joint effort.

Expectations:

We expect to not only create efficiencies, but also to build programs that have national visibility and impact that would not be possible otherwise.

<b>Table 1. Duke University Strategic Plan</b>						
<b>Estimated Initiative Time Lines</b>						
<b>Program Initiatives Legend</b>	Start-up Phase			Steady-state Phase		
	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
<b>Arts and Humanities</b>						
John Hope Franklin Center and Institute					Review	
Arts and Humanities Program Development Funds					Review	
<b>Science and Engineering</b>						
IGSP/A&S Programs					Review	
IGSP/SoM Programs					Review	
Nanoscience/A&S					Review	
Materials Sciences – Shared Clean Room Facility					Review	
Science and Engineering Research Institute					Review	
Global Change					Review	
High Performance Computing					Review	
Neural Analysis and Engineering				Review		
<b>Social Sciences</b>						
Social Sciences Initiative/A&S					Review	
Child and Health Policy					Review	
Environmental Solutions					Review	
Micro-Incentives Research Center					Review	
<b>Professional Schools</b>						
FSB – Faculty "Deepening" Initiatives					Review	
FSB – Center for Excellence in Business Education					Review	
Law – Faculty Development						
NSOE – Faculty Development and Deepening						
<b>Libraries</b>						
Perkins Library Planning Initiatives					Review	
<b>Information Technology</b>						
Center for Information Technology					Review	
Information Technology Investment Pool						
<b>Student Life/Student Services</b>						
Student Affairs Programming Initiatives					Review	
Undergraduate Recruiting Initiatives					Review	

<b>Table 2. Duke University Strategic Plan</b>						
<b>Estimated Initiative Time Lines</b>						
<b>Facilities Initiatives Legend</b>	Construction			Occupancy		
	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06
<b>Arts and Humanities</b>						
John Hope Franklin Center/Hanes Annex	Occupancy					
Nasher Art Museum		Construction	Occupancy			
<b>Science and Engineering</b>						
PSE/CIEAS		Construction	Occupancy			
Hudson Hall Renovation				Construction	Occupancy	
IGSP/SoM Facilities			Construction	Construction	Occupancy	
Center for Human Disease Models	Construction	Construction	Occupancy			
Center for Human Genetics	Construction	Construction	Occupancy			
A&S Science Facility			Construction	Construction	Occupancy	
A&S Science Renovations					Construction	Occupancy
A&S Bio-Sci Renovations	Construction	Occupancy				
<b>Social Sciences</b>						
Sanford Institute Expansion			Construction	Construction	Occupancy	
<b>Professional Schools</b>						
FSB Student Center	Construction	Construction	Occupancy			
NSOE/DUML Ocean Sciences Teaching Facility		Construction	Occupancy			
Divinity Addition		Construction	Construction	Occupancy		
<b>Libraries</b>						
Library Service Center	Occupancy					
Perkins Library Renovations			Construction	Construction	Occupancy	
<b>Student Life/Student Services</b>						
WEL Residence Hall	Construction	Construction	Occupancy			
Student Health Wellness Center		Construction	Occupancy			
Bryan Center Addition		Occupancy				
West Union Renovation		Construction	Occupancy			
Admissions Office Improvements		Construction	Occupancy			

## CONCLUSION

Duke University has completed a major planning process involving many members of the University community in analyzing our competitive advantages and constraints, our opportunities, and our resources. After taking stock of both the internal and external environments in which we operate, and predicting as best we can the trends that will affect us in the future, we have created an ambitious plan that will guide our decisions for the next five to ten years. Our overriding goal, as stated in the Introduction to this plan, is to be among the small number of institutions that define what is best in American higher education. The guiding principles, specific goals, and targeted strategic investment plans carefully developed over the last eighteen months and articulated in this plan will help us achieve this broad objective.

To achieve and sustain the kind of leadership role that James B. Duke envisioned for this university, we must build both a broader base of academic excellence at Duke and a strong, inclusive sense of community. We have created a bold plan, but one that is constructed on a solid foundation of existing excellence across the University. Our planning process was explicitly designed to build on existing strengths by blending a bottoms-up process originating in the faculty, departments, and schools with a top-down process involving the senior administrators, Academic Priorities Committee, President's Advisory Committee on Resources, Deans Cabinet, and the Planning Steering Committee, with oversight and input from the Board of Trustees. We have examined the university in its parts and as a whole, identifying strengths, weaknesses, and priorities in our academic programs and in our life as a community.

We have the opportunity and responsibility to expand our current strengths and to reach beyond them. We know that setting ambitious goals and realizing them are two different things. Achieving our goals will require continuing leadership and toil; the best efforts of faculty, students, and administrators; and the wisdom and support of the Board of Trustees and the many benefactors who share our vision. No plan is perfectly realized, and we will undoubtedly encounter unexpected challenges and opportunities. The general principles and specific goals set forth here will provide a framework that is both flexible and durable, allowing us to face the uncertain future with confidence. We look to the work ahead with a renewed understanding of our mission and how best to fulfill it as we strive to realize James B. Duke's vision of service and leadership for Duke University.