

The William R. Kenan, Jr. Institute for Engineering, Technology, & Science

2007-2010 Compact Plan

June 20, 2007

1. Context for Planning

The William R. Kenan, Jr. Institute for Engineering, Technology, & Science at North Carolina State University was launched in 1992 supported by a \$20 million grant from the William R. Kenan, Jr. Charitable Trust, which established the William R. Kenan, Jr. Fund for Engineering, Technology, and Science. The Institute's core funding derives from the proceeds of the investment of the Fund. The mission of the Kenan Institute is to develop partnerships in basic research, education, commercialization and public policy with individuals and organizations dedicated to the advancement of science, engineering and technology as forces towards improving the economic and social well being of the nation and the world. This document lists the Kenan Institute's programmatic and operational priorities for the next three years.

a. Key Findings from Program Reviews and Evaluations

The Kenan Institute conducted a review regarding how Institute funding and support has assisted the programs it supports at NC State University as well as those in collaboration with external partners. The review feedback received indicated that Institute resources are critical in enabling Principal Investigators to secure complementary and follow-on funding for programs. For example, the North Carolina Biotechnology Center reported that the Institute supported Collaborative Funding Grant (CFG) research initiatives continue to receive follow-on funding for years after the initial research, and reports that the cumulative average ratio of return for all CFG grants to date is approximately \$27 per dollar awarded. The Institute will continue to monitor and evaluate the progress of a representative sample of its programs. Consequently, the Institute can improve its performance by using the results of its program evaluations to make necessary programmatic and strategic improvements. In addition to requesting program leverage information, the Institute has implemented a summary report that requests Principal Investigators to report on the impact of funded programs on the society and the public welfare. The Institute will continue to collect relevant information regarding supported programs including tracking operating and program expenditures, as well as identifying and cataloguing funding recipients by college or organization.

b. Dashboard Measures

The achievement of appropriate leverage has been adopted as one of the metrics of the Kenan Institute's success. Consequently, the Institute reports to its oversight boards numbers representing the expenditures by our partners (including NC State) on programs in which we have invested. At the request of both our Institute trustees and the Kenan Fund for Engineering, Technology and Science, our budget-to-actual report reflects

leverage figures (projected to our fiscal year end) for both cash and in-kind contributions. These figures are not intended to be “hard numbers,” but rather indications by the principal investigators or managers of the projects of what the Kenan resources have “leveraged” for them in additional funding or opportunity. In seeking to attract complementary support of its programmatic initiatives, the Institute will continue to use a target minimum leverage ratio of three-to-one to measure project value in terms of the validation inherent in the successful solicitation of third party extramural support. This leverage ratio serves as an inherent, early measure of “project worthiness” that tests the ability of the project to attract the tangible, financial support of an interested third party. The Institute’s goal is to report a reasonable, conservative and supportable figure for each of our programs and partnerships that reflects the leverage achieved by our core resources.

In addition to leverage, the Institute also carefully considers the following measures to evaluate the potential for program development and partnership: impact (technical and societal), program sustainability, multi-disciplinary aspects, multi-institutional nature, state/national/international scope, and diversity.

c. Forecast

With the landscape of extramural funding for quality basic science research in universities shifting increasingly toward partnerships between industry and the state and federal governments, the role of the Kenan Institute becomes increasingly important to the success of these university-based, research partnerships. The Institute actively facilitates new partnerships throughout NC State University, and will continue to do so by describing the mission and current programs of the Institute to the Vice-Chancellors, Provost, Deans and other senior administrators of NC State University and inviting their participation in Institute activities.

2. Unit Goals for 2010

The Kenan Institute promotes innovation in the advancement of engineering, technology, and science by engaging multidisciplinary teams involving government, university, and corporate partners — partnerships that can help to solve scientific and societal problems, generate technology-based economic development, and bring together the public and private resources necessary to engage successfully in the emerging issues of our time.

It is a goal of the Institute to be of service to NC State by facilitating proposal development for centers and institutes that will be multi-institutional and multi-disciplinary, and will engage the very best investigators in our region in high-impact, high-visibility work. Through the contingent provision of matching funds and fellowships, the Institute may also be able to increase the competitiveness of these proposals. The growth and expansion of the influence and impact of the Kenan Institute are key considerations as Institute resources are allocated to respond to the challenges and opportunities in major areas of technological development for the 21st century.

In addition, the Institute will continue to support programs that are characterized by the diversity of their participants and scholarly focus. The Institute will seek to ensure that its continuing and new programs reflect the diverse perspectives and intellectual endowments of a broad population of participants from industry, universities, schools, and the general public. The Institute intends to initiate some of its new programs through the engagement of “pinnacle” faculty and multi-disciplinary research teams who will be expected to start centers and programs focused on a diverse agenda that impacts the public welfare through innovative research, education, technology commercialization, and public policy and economic development initiatives.

3. Action Items

a. Programmatic Initiatives

The Kenan Institute for Engineering, Technology & Science supports innovative programs in four strategic focus areas: high technology basic research, education, technology commercialization and entrepreneurship, and science and technology policy and public outreach. The Institute seeks significant leverage of resources for its activities and aims to develop programs that have a large positive impact on the economy and the public welfare through science and technology. The Institute’s programmatic priorities organized by the four focus areas are as follows:

HIGH TECHNOLOGY BASIC RESEARCH

Bioseparations/Bioprocessing Development Center (BBDC)

The Kenan Institute is pursuing the establishment of a *Bioseparations/Bioprocessing Development Center (BBDC)* to complement the educational role being played by BTEC. This will take the form of an industrial partnership that will provide resources and infrastructure for bioseparations and bioprocessing research and will allow for individual research contracts with companies. There are several faculty positions being generated by the establishment of BTEC in both the College of Engineering and the College of Agriculture and Life Sciences. The BBDC will provide these new faculty members an additional venue for their research efforts and should be attractive to companies as they involve NC State faculty more closely with their industrial issues in both education and research.

The BBDC is an effort of North Carolina State University to establish truly multidisciplinary research projects to help address pressing industrial needs in biomanufacturing in the following thrust areas: Bioreactors, Bioseparations, Biomass/Biofuels, Cellular and Interfacial Processes. An industry-university symposium on bioseparations and bioprocessing research needs for the next century was organized in collaboration with the North Carolina Biotechnology Center, and held on October 25-26, 2006. Research areas for collaboration and potential near-term opportunities for state and federally funded research contracts and grants were explored with industry partners.

Preliminary conversations with corporate partners have been very encouraging, and there are several areas of research that have been identified. The research effort will involve several colleges, including the College of Engineering, the College of Agriculture and Life Sciences, the College of Textiles and the College of Physical and Mathematical Sciences. It is anticipated that significant leverage will be obtained on Kenan Institute seed funding for this initiative, after an initial two or three-year start-up phase. It is hoped that the BBDC initiative will retain the partnership of at least 10 local companies, which would individually contribute approximately \$100,000 - \$125,000 support towards research contracts. BBDC leadership will invite the partnership of other UNC system institutions to make this a statewide initiative.

It is anticipated that the enhanced research capabilities of the BBDC will attract not only local and statewide industry interest but will also generate international attention and investment. The long-term sustained growth of the BBDC research program is expected to require approximately \$1,000,000 annual steady state funding, and will also require the establishment of new faculty positions as well as equipment and infrastructure investment.

Gordon Research Conferences

The Gordon-Kenan Graduate Research Seminar (GKGRS) has generated significant interest and is growing rapidly. Anticipated Graduate Research Seminars for 2006-2007, in conjunction with their respective current GRC meetings, include the following: *Bioinorganic Chemistry GKGRS, Analytical Chemistry GKGRS, Polymers GKGRS, Dendrites GKGRS, Polyamines GKGRS, and Polymer Colloids GKGRS*. GKGRS meetings anticipated for 2007-2008 include the following: *Catecholamines, Organometallic Chemistry, Plant Metabolic Engineering, Bioanalytical Sensors, Origin Of Life, and Protein Folding Dynamics*.

The GRC reported that this program has grown increasingly competitive. Twenty-one applications were received for GKGRS seminars in 2008. The GRC Board is reviewing the applications and 10 will be selected on merit. Kenan Institute support serves as seed funding only for new GKGRS programs and is available only once to any particular GKGRS. As such, GKGRS programs are expected to show the potential for being self-supporting in the long term.

The identification and selection of a NC site for future Gordon Research Conferences and Gordon-Kenan Collaborations remains a high priority. The Gordon Conferences are particularly interested in Davidson College as a site, and the Institute is collaborating with officials at Davidson and has submitted a proposal for the Gordon Research Conferences' consideration.

Infectious Diseases

In addition to supporting research regarding avian influenza, through the efforts of its Director, the Kenan Institute has been supporting the development of solutions towards such infectious diseases as mad cow disease. The Kenan Institute sees a significant opportunity for enabling important research in the area of infectious diseases. In particular, given the importance of the poultry and swine industry in North Carolina, and the known and potential impacts of infectious diseases such as avian influenza on the health of our citizens as well as the economic impacts, the Institute will focus resources on research efforts designed to address these problems. The Institute Director will continue to work closely with collaborators to publish scholarly papers and pursue additional center proposal opportunities such as the NSF Engineering Research Center (ERC) proposal on *Innovative Fibrous Systems*.

North Carolina Space Initiative (NCSI)

The North Carolina Space Initiative facilitates coordinated efforts among various educational, governmental and commercial organizations to develop and promote space-related activities with strong research, educational and commercial value. Since its inception, NCSI efforts have been wholly or partially responsible for generating complementary funding in the amount of \$15,842,271. The North Carolina Space Initiative is a partnership between the Kenan Institute, the NC General Administration, and the NC State Office of the Vice Chancellor for Research and Graduate Studies. To that end, in addition to a cash contribution of \$50,000 per year, the Kenan Institute is providing in-kind support including office space, and time effort from its Office Assistant (20% time effort) and from its Assistant Director of Programs (25% time effort). Appreciating the continuing opportunities for program growth and development, the Kenan Institute would welcome the continued partnership of the Office of the Vice Chancellor for Research as well as any additional overhead resources that enable the vital promotion and development of the North Carolina Space Initiative.

The North Carolina Space Initiative is collaborating with the NC Department of Commerce and the National Aerospace Development Center to build upon opportunities for enabling workforce development within the aerospace sector and any corresponding high-tech high-growth segments that enhance the competitive advantage of existing NC aerospace focused activities. Additional research is being conducted to better understand the industry and ways in which this sector could be enhanced. Additional financial and human resources will be required to proceed with more comprehensive follow up efforts that will build upon the analysis and work to date.

Energy and Environmental Issues

Perhaps the most critical global challenge for the 21st Century is maintaining a healthy, productive environment that will continue to support life in the face of an increasing world population, energy shortages, shrinking freshwater supplies, destruction of natural

habitats, and declining genetic diversity. Integrating all we know—from scientific, economic, social, and spiritual perspectives—is key to understanding and resolving these issues.

The Kenan Institute sees an opportunity in this arena to promote statewide economic development, sustainable, healthy, and diverse ecosystems, and national energy security through development of bio-based and other renewable resources and processes. Appreciating that NC State faculty members are involved in projects linked to air and water quality, energy conservation, toxicology, habitat preservation, and environmental education and analysis, directing Institute resources towards this research thrust will enhance the University's land-grant mission promoting good stewardship of North Carolina's natural resources.

In addition to working with the Institute for Emerging Issues to lay the foundation for the 2008 Emerging Issues Forum on Energy, the Kenan Institute is working with NC State Professor Chris Gould to support a symposium on energy research needs and advancements. Specifically, the purpose will be to (1) assess the technological needs associated with environmentally sustainable energy production, distribution, storage and utilization; (2) highlight the strengths in energy related research in the Triangle (universities, government agencies, non-profit institutes); (3) build competitive triangle-wide partnerships, collaborations and research teams to pursue funding opportunities from state and federal agencies, and from industrial sponsors.

NC State Nanotechnology Institute

On the national level, nanotechnology has been identified as one of the key future technologies with the potential to profoundly impact our economy, environment, and society, and extensive governmental resources are being committed to this area. To create long-term opportunities for groundbreaking nanotechnology research, education, and outreach at NC State University, the College of Engineering (COE) is supporting the efforts of faculty from multiple departments, and other colleges to develop the North Carolina Nanotechnology Institute. Key research themes for the NC Nanotechnology Institute will be built around nanobiotechnology, nanotechnology for energy and the environment, and nanomaterials and nanomanufacturing. Currently, a significant number of NC State's very strongest faculty are engaged in nanotechnology-related research. A recent assessment by Dr. Clayton Teague, Director of the National Nanotechnology Initiative, confirms that the breadth and depth of this activity at NC State is comparable to that of the country's leading nanotechnology programs. The Kenan Institute is interested in supporting this initiative in collaboration with NC State's Vice Chancellor for Research and Graduate Studies, the College of Engineering, the College of Physical and Mathematical Sciences.

Biomass and Biofuels Research Development Initiative

NC State Professor Steve Peretti, in collaboration with the North Carolina Solar Center and Carolina Soy Products, is researching the conversion of glycerol to glycidol or glycerol carbonate, which would provide a byproduct to the marketplace that would

ultimately displace petroleum-based materials and provide additional income to the rural communities where biodiesel is produced. The overall objective is to reduce North Carolina's dependence on foreign oil, boost the state economy, enhance quality of life in rural communities, and foster and support a new biomass based energy infrastructure. This project has enabled the development of major complementary initiatives. A proposal has been submitted to the Golden Leaf Foundation requesting approximately \$1.6 million to establish a small pilot plant facility that will be used to evaluate the conversion of biomass resources already present within the state into ethanol. This grant would further enable and leverage a larger scale effort to establish an Integrated Biomass Refining Institute (IBRI) at NC State University, which would be focused on advancing the conversion of sustainable biomass resources to fuels, chemicals, and power in order to create economic growth, encourage energy independence, protect the natural environment, and reduce energy costs for consumers. The Kenan Institute is interested in supporting this area of research and believes that biofuels innovation will significantly complement and inform the research being conducted in the area of energy and environmental issues.

EDUCATION

Kenan Fellows Program for Curriculum and Leadership Development

The Kenan Fellows Program has developed a strategic plan to expand the program across North Carolina. The initial expansion will focus on the Advantage West, Northeast, Eastern, and Southeast Economic Partnership Regions, which taken as a whole, include North Carolina's most economically disadvantaged school districts. These regions also exhibit much higher teacher turnover rates, significant cultural upheaval through tobacco industry losses, and inadequately diverse teacher bases relative to large minority student populations. At full capacity, the Kenan Fellows Program aims to offer 50 new two-year internships coordinated on a bi-annual enrollment basis with a residential component for summer professional development activities. The Kenan Fellows Program expansion has already begun and the current class of Kenan Fellows represents the first bi-annual Kenan Fellows Class. The next recruitment for the Kenan Fellows Class of 2010 will initiate in the Fall of 2007. As part of the residential model, each summer, Kenan Fellows from around the state will join in Raleigh for two weeks to participate in a summer internship. Fellows will then return home to work with their Mentors within their respective regions and communities.

Changes in the program structure will enable the Kenan Fellows Program to engage more teachers in the program, offer more diversified opportunities for Kenan Fellows and Alumni, and enhance the operational and programmatic efficiency and effectiveness of the Kenan Fellows Program.

The Kenan Fellows Program has developed a comprehensive internal and external communications plan that includes an e-newsletter and enhanced program identity materials, including a prospectus entitled *Directions: Leading the Way in Public*

Education. The Kenan Fellows Program will create an Advisory Board under the direction of Institute Trustee Dr. Charles Coble. This board will be comprised of influential elected officials, corporate leaders, educators, and public relations representatives from across North Carolina and a representative Kenan Fellow and Mentor.

The Kenan Fellows Program is pursuing an aggressive resource development strategy that includes seeking funding from both public and private entities. Foundations and companies such as IBM, SAS, Progress Energy, Goodnight Educational Foundation, Lee County Education Foundation, GlaxoSmithKline, and Weyerhaeuser Co. Foundation that have supported the program in the past will be approached again for continued funding. In addition, the Kenan Fellows Program will target new foundation funding sources such as Golden Leaf, Babcock and Bryan. Local corporations have long supported the work of the Kenan Fellows Program. In addition, the Kenan Fellows Program will continue to seek federal funding from NSF and other government agencies. By continuing to leverage the opportunity for University faculty to add Kenan Fellows on to a large grant as their K-12 outreach component, the Kenan Fellows Program will continue to be key partners in a proposals success. Finally, the Kenan Fellows program will actively work toward securing funds from the North Carolina General Assembly and the North Carolina Federal delegation.

An expanded statewide Kenan Fellows Program will require approximately \$1,800,000 steady state funding to achieve its programmatic goals. In addition to support from the NC General Assembly, plans are being developed to solicit supplemental funding from the William R. Kenan, Jr. Charitable Trust as well as other corporate and foundation partners.

The Kenan Institute for Engineering, Technology and Science, through its Kenan Fellows Program, is an integral part of NC State University's initiative to improve STEM education. The Kenan Institute will need an enhanced funding base for statewide expansion of the Kenan Fellows Program. The \$500,000 anticipated support from the NC General Assembly is critically necessary to achieving the goals of the Kenan Fellows Program. Specifically, the Institute would need approximately \$300,000 of the \$500,000 anticipated for the STEM education initiative to be applied towards the work of the Kenan Fellows Program in fulfilling its objectives as a part of the STEM initiative.

Undergraduate Research and Scholarship

The Institute also recognizes the value of promoting and enhancing scholarship at the undergraduate level. The Institute is supporting the State of North Carolina Undergraduate Research Symposium, which is facilitated by NC State University. This hallmark event highlights the scholarship of students from both the private and state-supported colleges and universities across the state. Representatives from North Carolina companies, as well as graduate and professional school recruiters, are invited to set up

displays as a way of attracting the state's very best rising graduates. In Fall 2007, the symposium will be held at the University of North Carolina at Greensboro.

In addition, the Institute sees opportunities for enabling academic excellence through programmatic collaborations that will help students pursue high value fellowships and scholarships such as the Rhodes Scholarship, Truman Fellowship, and Marshall Fellowship.

TECHNOLOGY COMMERCIALIZATION AND ENTREPRENEURSHIP

NC State TEC Program and University-Wide Entrepreneurship Initiative

The Kenan Institute remains committed to supporting NC State's Entrepreneurial activities and is investing its resources in programs such as the Technology, Entrepreneurship, and Commercialization (TEC) Program, the Center for Innovation Management Studies (CIMS) and also a university-wide initiative, the NC State Entrepreneurship Initiative, which proposes to infuse entrepreneurship and entrepreneurial practice throughout the university and the community, thus establishing NC State as the prototypical entrepreneurial Land Grant University of the 21st Century.

Also, K-12 teachers selected as Kenan Fellows will work with NC State faculty mentors to develop K-12 curriculum materials based on the entrepreneurial pedagogy and processes taught to undergraduate and graduate students at NC State. Curriculum materials will be developed that tie into the framework of the NC Standard Course of Study in Economics and will enhance the Business and Marketing Education curriculum taught in NC public schools. Coordinated by NC State's Vice Chancellor for Extension and Engagement, the NC State Entrepreneurship Initiative leverages resources from each of NC State's Colleges and is seeking legislative funding as well as corporate and philanthropic partnership funding.

SCIENCE AND TECHNOLOGY POLICY AND PUBLIC OUTREACH

Public Outreach Programs – Conferences and Symposia, Senior Fellows, Visiting Scholars, Undergraduate Scholars, Museum Collaboration

The Kenan Institute will also continue to sponsor conferences and symposia that engage a wide variety of participants in dialogue regarding diverse issues such as leadership, economic development and sustainable development. In addition to conferences and forums, the Institute will continue to support programs that are characterized by the diversity of their participants and scholarly focus. The Institute will seek to ensure that its continuing and new programs reflect the diverse perspectives and intellectual endowments of a broad population of participants from industry, universities, schools, museums, and the general public.

Specifically, the Institute would consider initiating and incubating new programs through the recruitment of “pinnacle” faculty and multi-disciplinary research teams who would be expected to start programs focused on a diverse agenda that impacts the public welfare through innovative research, education, technology commercialization, and public policy and economic development initiatives. These “pinnacle” faculty members could serve in the role of “Senior Fellows” or “Visiting Scholars” of the Institute enabling the development of initiatives that further the public outreach and impact of University programs. The Institute would consider providing some seed funding and administrative and in-kind office space support to facilitate the development of these new initiatives.

Institute for Emerging Issues (IEI)

The IEI continues its programmatic growth and outreach in the areas of healthcare, tax and finance reform, higher education, and energy. The IEI will be hiring significant additional staff in order to facilitate its programmatic goals in these areas of work. In turn, this will require the Kenan Institute to increase its in-kind support to the IEI, primarily the support for human resource and financial transactions performed by the Kenan Institute’s administrative manager. To date, the Kenan Institute has not received any administrative overhead from IEI related activities. However, IEI administration consumes approximately 15% time effort from the Kenan Institute’s administrative manager’s time. This effort is expected to grow to as much as 30% as the IEI grows and hires more staff. As such, the Kenan Institute would welcome additional overhead resources to defray some of the costs of administering IEI personnel and financial transactions.

International Programs

NC State University realizes direct benefits from international activity. Foreign scholars and students coming to our campuses bring fresh viewpoints to our departments and broaden the horizons of faculty and students. Faculty and students who work or study abroad return to the University to share a greater understanding of global inter-relatedness and new perspectives on their professional fields, as well as new perspectives on their own communities and cultural values. Recognizing and accepting global diversity encourages faculty and students to understand cultural and social differences within North Carolina. The development of these new and shared perspectives is a cornerstone of the University and represents a significant gain for the institution, its faculty, and its students, as well as for the State.

The Kenan Institute is committed to expanding its partnership base to include more national and international partnerships. The Institute has been highly effective at forging partnerships between NC State University and numerous industry and government organizations. As it has done with the Gordon Research Conferences, the Institute intends to continue to add to its partnership base by attracting the involvement of highly recognized national and international organizations in support of Institute programs. The Institute intends to collaborate broadly with individual colleges as well as the Office of the Vice Provost for International Affairs to further enable international experiences for faculty and students at NC State University.

b. Operational Priorities

Kenan Institute Office Suite and Facilities

The Kenan Institute acquired additional office space adjacent to its existing suite 3200 in Partners Building I. This additional space is required to accommodate the imminent growth of existing programs such as the Kenan Fellows Program and the North Carolina Space Initiative. In addition, it is anticipated that the Kenan Institute will use this additional space to incubate new programs. The Kenan Institute renewed its lease in Fall 2006.

The Institute will receive \$34,447 in support from the Chancellor's unit as cost sharing. Appreciating that this investment enables the growth and impact of the Institute and its programs, which generate overhead returns to the University, the Institute would welcome annual pro-rata increases to the cost share inclusive of the additional space now being occupied by the Institute and its programs.

Additional improvements and enhancements to the Institute space, which are being implemented, have included the following: improvement of the Institute office suite's heating and cooling systems, replacement of the carpet, refreshed painting of the Institute suite, improvement and addition of furniture and equipment in the new suite.

Website and Brochures

The Kenan Institute is implementing a strategic revision of its identity materials including its logo, brochure and website. The revision and updates to the Kenan Institute web site and publications, project summary report documents, and annual report will continue to improve the Institute's public perception, and facilitate easier communication with stakeholders, hopefully leading to increased opportunities for enhanced performance of the Institute's mission.

Board of Trustee Appointments and Committee Involvement

The Institute will continue to seek the input and advice of its trustees and will engage its trustees in the growth and expansion of current programs and invite the trustees' guidance regarding the development of new programs. For example, the Institute will invite the participation of its trustees regarding the Kenan Fellows Program as it implements a statewide expansion strategy with long-term sustained funding. The Institute will engage the trustees in ad-hoc committees as necessary to facilitate specific action items that arise out of trustee meetings, including program development, Board governance, and interaction and engagement with the Directors of the Kenan Fund for Engineering, Technology and Science.

The Institute will keep abreast of the term cycle of existing trustees and will recommend new appointments to the Board of Trustees as required by the expiration of trustee appointment terms or retirement of existing trustees. The Institute will engage the trustees in soliciting recommendations for new Board member appointments.

4. Resources

a. Funding Requirements

The Kenan Institute continues to receive cash support from NC State for salaries and rent, which complement the funding provided by the Kenan Fund for Engineering, Technology, and Science. As support from the Kenan Fund continues to increase, the Institute welcomes the potential for increased operating fund support from NC State in order to meet the needs of program growth. This increased funding support would be applied towards salary and rent costs and would serve to match the operating fund support provided by the Kenan Fund for Engineering, Technology and Science. In addition to increased operational fund support, the Kenan Institute would welcome the continued consideration of return on overhead charged by the university.

Regarding programmatic growth and development, the Institute remains committed to enhancing the funding base for the Kenan Fellows Program, the NC Space Initiative, and the Bioseparations and Bioprocessing Development Center. In particular, the Kenan Fellows Program statewide expansion will require approximately \$1.8 million to implement. As a part of NC State's STEM Initiative, the Kenan Fellows Program would need significant state funding support to enable the statewide expansion. Anticipating the potential for \$500,000 in funding from the NC General Assembly in support of the NC State STEM Initiative, the Institute would welcome the application of \$300,000 of the anticipated funding in support of the Kenan Fellows Program as it fulfills NC States' STEM Initiative mission.

b. Staffing Requirements

The Kenan Institute currently has eight full time employees. The Institute recently completed an efficiency review and refinement of position descriptions regarding existing positions that work with the Kenan Fellows Program. In response to program growth and operational needs, the Kenan Institute anticipates the need to create two new positions including a Technology and Communications Specialist and an Assistant Director for Development and K-12 Education/University Partnerships. The Technology and Communications Specialist will be supported by funds from the Kenan Institute, the Kenan Fellows Program, and the NC Space Initiative. The Assistant Director for Development and K-12 Education/University Partnerships will work with the Kenan Fellows Program to enable grant proposal development and partnership and resource identification within the university system and in conjunction with local education agencies.

c. Efficiency Initiatives

The Institute has sought to keep staff and administrative overhead as low as possible. Rather than encumber the Institute administrative staff with unnecessary handling of large cash flows (and the resultant paperwork and accounting necessary to redistribute those funds) we request that our partners direct their support to meet the objectives of the partnership.

As an example, rather than asking the NC Biotechnology Center to disperse their contribution to the Collaborative Funding assistance program to the Institute, thereby requiring the Institute staff to redirect the contribution to the user of the funds, we ask the Biotech Center to distribute their contribution directly to the faculty member and Kenan Fellow. Similarly, in the same program, we do not receive funds from the corporate sponsors, but instead we instruct the corporate sponsors to pay their contributions directly to the faculty principal investigator at each university or research center, thereby streamlining the flow of cash between sponsor and researcher.

5. Planning Process

Institute strategy and program selections are guided by the advice of the Chancellor and the Institute's Board of Trustees, as well as the Chairman, President, and Board of Directors of the William R. Kenan, Jr. Fund for Engineering, Technology, and Science. The Kenan Institute Board of Trustees meets formally twice a year and the Kenan Institute engages its board members regularly on an ad-hoc basis to counsel the Institute leadership strategically regarding program development. The Institute Director, Associate Director, and Program Directors meet regularly to consider and inform the strategic goals, implementation steps, and resources needed to meet the objectives of Institute supported programs. These meetings are the basis for the process that continues to guide the development of the Kenan Institute's compact plan.