

Staying a Step Ahead: Higher Education Transforming North Carolina's Economy

Preliminary Recommendation

A Brief Overview

As you may recall, Pappas Consulting provided an Interim Report in May 2005. More recent data became available from the NC Employment Security Commission which projected job needs to 2012 that required revision of the Interim Report. Pappas Consultants issued a Revised Interim Report on December 29, 2005 and a set of Preliminary Recommendations. An expanded set of recommendations will be included in the final report. The Preliminary Recommendations are included here and the Revised Interim Report will be provided at the Educational Planning Committee and Board meetings.

The Revised Interim Report reviews data from other studies, from the Employment Security Commission, from NCCCS, from UNC, and from national sources to provide a basis for assessing educational needs in NC and the degree to which those needs are being met by NCCCS and UNC. It identifies areas where there are gaps between the State's educational needs and available academic or training programs. It includes discussion of regions and the likely focus of future economic development. The Report identifies six industry clusters and identifies the extent to which each is present in the economic development regions. The clusters are advanced manufacturing; advanced materials, including chemical, plastics and nanotechnology; biotechnology and pharmacology; computing, software, and the Internet; design and arts; and logistics and distribution. The report also provides a discussion of research activity and the transfer of technology.

Overall Preliminary Conclusions and Recommendations

The Preliminary Recommendations summarizes some of the overall findings to date and provides a number of recommendations largely divided between NCCCS and UNC, though an overriding theme is the promotion of greater interaction and cooperation between the two.

The consultants find, contrary to what they thought was anticipated, that "the gaps that are projected to exist are, to a large degree, not of the magnitude to require extraordinary action." They also find that where there are major gaps, "specifically in teachers and nurses, the State has already begun major initiatives following comprehensive studies." Based on NCCCS's and UNC's track records the consultants are confident that higher education in NC can respond both to the numbers of graduates needed, and to the changing needs that long-term projections may miss. The consultants also comment that both NCCCS and UNC have been successful in adding needed new programs, "preventing the expensive duplication of programs," and "sustaining the overall quality of programs." They conclude this section with, "Nothing in the study to date leads to the conclusion that major mission changes are needed with the exception that most UNC

institutional missions are not explicit about the economic development role of universities.”

The consultants are less sanguine about the type of graduates being produced. They express concern whether the campuses are intentionally producing graduates who have the “soft” or “21st century skills” desired by employers. Those are identified as critical thinking, working in teams, superior communication skills, ability to plan and organize, ability to exhibit professionalism, and the capacity to assimilate new technology rapidly.

The consultants find that the means of delivering education using technology need to be expanded with more online and hybrid programs available to potential students.

They find the largest gaps between State needs and degreed students being produced are in computer related fields, teaching, and nursing. They do not believe that teaching and nursing are in need of further study, since comprehensive studies have been done recently and plans are in place to significantly increase the number of graduates in each area. The computer field, the consultants believe, may require further study. Projected demand has fluctuated significantly in recent years and that has affected the willingness of students to enter the field.

They identify the production of faculty by UNC institutions for NCCCS as an issue that might be broadened beyond the current focus on nursing faculty.

Historical Minority Institutions (HMI)

The consultants reiterate their praise for the achievements of the focused growth initiative, stating, “Other states have attempted to strengthen HMIs, but it is hard to imagine any program that has been more successful than this one.” The consultants question whether “sustaining growth and quality at the recent rates for most of the HMIs” will be possible. While they think a good job has been done in getting the new academic programs up and running, they think the infrastructure may be feeling some strain, and that “the program side may also be in need of a period of consolidating the gains by careful program assessment and review.”

The consultants recognize that momentum needs to be maintained at the HMIs but note that “the employment gap data do not provide obvious areas for signature program development for HMIs.” Some areas are suggested such as rehabilitation counseling, clinical counseling, school psychology, and nursing. They comment that the data alone do not make a compelling case for professional programs, but they recognize a shortage of pharmacists and see the new model of delivery between UNC-CH and ECSU to be a promising one. The consultants see the need for further discussion with General Administration regarding recommendations in this area.

Initial Recommendations on Findings from the Interim Report (December 2005)

These preliminary recommendations grow out of findings from the Revised Interim Report. The matrix includes both summaries of the findings and the recommendations as

well as timelines and who is responsible. The recommendations in this section, of which there are approximately 60, are in the second column from the left.

There is an appendix to the Preliminary Recommendation that contains additional recommendations under the title, The Impact of Technology Transfer on Workforce Needs in North Carolina. These recommendations are directed at actions UNC and the campuses can take to further stimulate economic development in NC. The recommendations overlap with the recommendations of the Board's Economic Development Committee and the themes of the new strategic direction, Economic Transformation.

December 29, 2005

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PAPPAS
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Dear President Broad and President Lancaster:

The Pappas Consulting Group Inc. is pleased to present you two documents related to our engagement to assist you with the study called for in HB1264, Staying a Step Ahead: Higher Education Transforming North Carolina's Economy. The first document (*sent separately*) is a revision of the Draft Updated Interim Report of Preliminary Findings that we sent you on December 1, 2005. We received a number of comments and corrections from both of your offices, many of which we have now incorporated into this final report. While these comments and corrections have improved the accuracy of the report, and we thank you for them, they have not changed substantially the findings.

The second document (*attached*), Draft Preliminary Recommendations HB 1264, Staying a Step Ahead: Higher Education Transforming North Carolina's Economy, includes a narrative of some of our general conclusions and recommendations, a matrix of initial recommendations linked to each of the findings from the Interim Report, and an appendix on research and technology transfer. We will particularly welcome your reactions to sections II and III as those comments will give us direction for our next phase of work, which is to complete final recommendations. Our goal is to provide you those in draft form prior to the next legislative session.

These general conclusions affirm that both UNC and NCCCS have been proactive in responding to, and anticipating, the need for graduates at all levels for North Carolina's present and future economy. Where major gaps exist, they are in areas (computer science, teaching, and nursing) that every state is experiencing shortages and which have issues within the professions. We do not, at this stage

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of our work, see the need for major mission or major policy changes. We do see a need for more structured approaches to collaboration between the higher education systems (and K-12) to build on previous cooperative ventures. We also see a need for significant attention to skill sets that nearly all students will need to function effectively in the knowledge economy. This was a message we heard consistently from all types of employers. We also conclude that the HMIs have prospered substantially from recent initiatives and that these need to be continued and consolidated.

We believe, then, that North Carolina, in no small measure because of its higher education institutions, is "staying a step ahead." However, the competition is no longer other states nor is it just national. The competition for economic competitiveness is now truly global. Therefore, we want to focus our final recommendations on those areas that could provide North Carolina that global competitive edge at all levels of the economy.

We look forward to your feedback on this draft and ask that you provide us with your comments by the end of January, so that we are working on the right set of issues for the final recommendations.

Thank you for the opportunity to work on this vital project. Both of you have provided strong and consistent leadership on linking higher education and the state's economy, which is the major goal of this study. As President Broad concludes her very successful tenure as President of UNC, we expect that the final outcomes of this study will further enhance her legacy to the people of North Carolina.

Sincerely,



Alceste T. Pappas, Ph.D.
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DRAFT

**STAYING A STEP AHEAD: HIGHER EDUCATION
TRANSFORMING NORTH CAROLINA'S ECONOMY**

PRELIMINARY RECOMMENDATIONS

I. INTRODUCTION

Continuing its nationally recognized tradition of being a progressive leader, North Carolina has been examining the role of higher education in its economic future. The catalyst for this examination was the 2004 HB 1264, which called for The University of North Carolina and the North Carolina Community College System, with the assistance of a private consulting firm (Pappas Consulting Group Inc.), "to conduct a comprehensive study of the mission and educational program needs of the two systems." Specifically, the bill called for:

1. An analysis of demographic, economic, and educational data regarding the need for higher education programming in the State as a whole, as well as in all geographic and economic regions of the State.
2. An updated enrollment projection for each System and each institution that includes adult, non-credit, career, and degree program enrollments.
3. An analysis of current program offerings and majors in undergraduate, graduate, non-degree, and workforce training programs, offered by each institution.
4. Recommendations as to how the institutions might better serve current and emerging needs related to existing and new programs; opportunities for regional program delivery; enhanced effectiveness and quality that can be achieved via sharing of resources, and program partnerships and collaborations both within and between higher education systems; and opportunities for online program delivery and other distance technology delivery systems.
5. An analysis of and suggested updates to existing long-range capital plans of both the University and Community College Systems that will address land acquisition and facility needs to support the program recommendations identified in this study, taking into account opportunities for modernization of and new uses for existing facilities.

6. With regard to the University System, there shall be special emphasis on the development of signature programs for Historically Black Colleges and Universities and the University of North Carolina at Pembroke. In conducting the study, the consulting firm shall take into account that the General Assembly finds the Historically Black Colleges and Universities and the University of North Carolina at Pembroke to be institutions with important historical traditions and equally important contemporary purposes and, as such, are valuable and indispensable assets of The University of North Carolina and the State. The General Assembly intends to encourage the continued growth and development of those constituent institutions and would resist any suggestion to eliminate the historical function and purpose of those institutions.
7. With regard to both the University System and the Community College System, there shall be an acknowledgement of the existence and importance of a strong liberal arts education foundation and, at the same time, an emphasis on existing and new programs specifically aimed at meeting business, industry, workforce, and career needs of North Carolina in the State's changing and growing knowledge-based economy, taking into account, as appropriate, State and regional economic strategies.

An Interim Report that focused on findings was issued in May 2005. An Updated Interim Report was issued in December 2005 so as to reflect the North Carolina Employment Security Commission's occupational projections through 2012 (the previous report only had 2010 data available). Interestingly, this updating exercise illustrated some of the limitations of such projections since there were a significant number of changes in the high demand occupations and some definitional changes that had an impact (for example, educational levels required for certain employment categories changed in the two sets of projections).

The Updated Interim Report provided the information required in HB 1264 for items 1 (state and regional data), 2 (enrollment projections), and 3 (current academic programs). It also provided background information on items 4 (collaboration and distance learning), 6 (role of HMI's), and 7 (Liberal Arts). Item 5, long-range capital plans, was not included because of the need to complete academic program analysis first.

This "Preliminary Recommendations" report addresses each of the "findings" from the Updated Interim Report. At this stage of the study, these are primarily summarized in the matrix on pages 7-39. The matrix includes the finding, provides a summary recommendation, identifies the responsible party, and specifies a timetable. A number of recommendations suggest processes to enhance further the collaboration between UNC and NCCCS. Other recommendations include suggested statutory changes and appropriation requests.

II. OVERALL PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

The matrix recommendations are specific to the original findings. As the study has proceeded, however, it has become apparent that the overall conclusions are taking a different form than perhaps originally anticipated. The HB 1264 language seems to anticipate, quite logically, that the study would identify large gaps between the projected job and career needs of North Carolina and the production of graduates by UNC and NCCCS. Further, the language anticipates that these gaps would require that additional academic programs be created, perhaps necessitating mission changes either at the system(s) or institutional levels. Finally, again very logically, the legislative language seems to anticipate that new programs would require new facilities. While some of this may still be true, the overall conclusion to date is that the gaps that are projected to exist are, to a large degree, not of the magnitude to require extraordinary action. Where there are major gaps, specifically in teachers and nurses, the state has already begun major initiatives following comprehensive studies. Also, it should be noted that North Carolina, for many reasons, has the ability to attract in-migration of employees in needed areas.

This overall conclusion is a compliment to both UNC and NCCCS and their regular processes for identifying and responding to employment needs. With some modifications to these processes, as identified in the recommendation matrix, there is every reason to believe that, with continued legislative budgetary support (again, with some recommended modifications), higher education can respond to the future needs for the number of graduates in specific fields. This is true for both traditional jobs and careers and for jobs and careers in the emerging industries identified in the Interim Report. Additionally, the track records of both UNC and NCCCS suggest that they are capable of responding to changing needs that long-term projections may miss. Finally, both UNC and NCCCS appear to have been relatively successful not only in adding new programs (in UNC the additions at the HMI's are particularly noteworthy), but also in preventing the expensive duplication of programs and in sustaining the overall quality of programs. Thus, nothing in the study to date leads to the conclusion that major mission changes are needed with the exception that most UNC institutional missions are not explicit about the economic development role of universities.

Yet while higher education in North Carolina may have the processes in place (with some modifications) to produce (or attract in) the number of needed graduates, there are significant questions about whether it can produce the type of graduates that the 21st Century knowledge economy demands. Employers, especially those in emerging industries, want graduates with "soft skills" or "21st Century skills." By this, they mean graduates who are critical thinkers; graduates who can work and contribute in teams; graduates who have superior communication skills; graduates who can plan and organize; graduates who exhibit professionalism in all that they do; and graduates who can assimilate new technology rapidly. While many of these skills may be by-products of a higher education, a strong case can be made that they ought to be intentional and, to the extent possible, measurable outcomes of a higher education. For example, the general education component of higher education usually is designed around an array of menu courses (a distribution requirement) rather than specified skills and knowledge. The same is true for degree (associate or bachelors) requirements.

This conclusion requires further exploration, particularly for developing recommendations that address teaching methodologies, faculty development, and curriculum redesign.

In addition to the type of graduates required in the future, the study also concludes that the means of delivering education need to be expanded. New technologies offer new possibilities, but the technology infrastructure for both UNC and NCCCS must be robust enough to allow for a significant expansion. This use of technology also has significant implications for faculty development and for creating “hybrid” forms of degrees (partially offered in concentrated in-person mode and partially through distance education, preferably Internet-based). Such hybrid degrees may have implications for ready access to facilities. In many cases perhaps existing higher education facilities (such as extension offices associated with land grant universities) or related facilities (such as public libraries) could play a role.

There are three areas where significant gaps between the number of graduates produced and the projected jobs already exist and may well persist: computer related fields, teaching, and nursing. The computer area presents several challenges. First, the industry is one that changes very rapidly. Second, the demand for employees sees extraordinary swings. For example, the ESC data using 2000-2010 numbers projected a need for 4,830 bachelors graduates a year. However, once the “bust” technology years were included, the 2002-2012 projections fell to 1,770 bachelors graduates. A similar pattern exists for associate degrees in the computing area. The demand for both types of degree are down, yet the gap that remains is still very significant (over 1,000 bachelors degrees, for example). Third, compounding this situation, the production of graduates has declined in both UNC and NCCCS, which is hardly surprising as students monitor job trends quite carefully. Finally, this field appears to lack appeal to women and minorities, both of whom are underrepresented. The demand for graduates with computer skills is reported by the industry to be back on the increase. However, if the domestic market does not respond to the demand, the industry has shown a willingness to outsource functions overseas. All of these factors suggest that this is an area for further study.

The other two significant gap fields, teaching and nursing, are not in need of further study. Both have been studied extensively, and there are a multitude of recommendations, best practices, and funding requests. UNC has set very explicit targets, especially in the teaching area. NCCCS has also begun to play an expanded role in teacher education. There is one fundamental difference between the gaps in the supply of teachers and nurses: the teacher gap is largely a function of the lack of demand (too few students seeking a degree), whereas the nursing gap is largely a function of supply (the demand exists from students but there is an insufficient supply of “slots” in higher education).

The two areas, however, share many similarities. They are both “high impact” fields, meaning that economic development in any community depends on that community having good schools and good healthcare. They both require practicums. They have both traditionally been female dominated occupations. They have both suffered from underrepresentation of minorities. They both attract (and currently depend on) in-migration of employees. They are both professions that have salary and workplace issues.

While the final recommendations will include specific items (such as simplifying and updating scholarship programs), one notion that needs further exploration is the bringing together of these two professions to present a highly targeted, combined legislative agenda. The joint influence of the education and healthcare communities would be powerful indeed, as would bringing together faculty and administrators from both fields.

Another area for a combined effort is the production of faculty by UNC for NCCCS, particularly in certain high demand fields. The health-related professions would be an obvious area for an initial program (especially nursing); however, UNC and NCCCS leadership should develop a comprehensive program that would include student recruitment (including, perhaps, guaranteed employment), student scholarships, an accelerated curriculum, and the creative use of distance learning. Once the program is designed, UNC and NCCCS should present a combined funding request to the North Carolina legislature. Such a program has the potential to make a major impact on the long-term quality of instruction in NCCCS, as well as increasing student access. It also would further advance the relationship between NCCCS and UNC.

III. HISTORICALLY MINORITY INSTITUTIONS (HMI)

As the Interim Report documents (see pp. 107-110), the UNC focused growth initiative has had an extraordinary impact on the HMIs. Their enrollments have increased dramatically; their facilities have been expanded and improved; their academic program arrays have become more extensive; and their research grants and contracts have increased. As the Interim Report concludes: "Other states have attempted to strengthen their HMIs, but it is hard to imagine any program that has been more successful than this one."

With success, however, comes some challenges. Sustaining growth and quality at the recent rates for most of the HMIs may not be possible. The infrastructure, the facilities, and the process for hiring and orienting new faculty may all be feeling some strain. The new academic programs are up and running, enrolling good numbers of students, and creating very positive impacts (especially as most are in high demand fields, including science and technology areas). Yet the program side may also be in need of a period of consolidating the gains by careful program assessment and review.

This need to "catch up" infrastructure, processes, and program evaluation has also to be balanced with the need to maintain momentum and to realize ambitions. The difficulty arising out of this study is that the employment gap data do not provide obvious areas for signature program development for the HMIs. At the bachelors level, all of the HMIs already offer programs in the high demand fields. The masters level offers some possibilities, especially in the specialized science areas (where UNC has launched a funded project for the overall system). Rehabilitation counseling is a masters area with high demand and low supply; only four UNC institutions offer the program, including only one HMI. At the Ph.D. level, this is largely a mission and resources question as the data do not identify many North Carolina specific areas of shortage (with the exception of clinical counseling and school psychologists, and perhaps, nursing).

Professional programs are often sought as “signature programs” by institutions because of their apparent prestige. Again, though, the available data do not make a compelling case for the addition of any new stand-alone professional programs. Certainly, the shortage of pharmacy graduates is significant, especially when the high rates of pharmacy positions currently filled by in-migration are considered. However, UNC has already responded by developing a collaborative program between UNC Chapel Hill and one HMI (Elizabeth City State University); another is under consideration (Winston-Salem State University). These collaborative, joint professional programs could be considered pilots and possible models for additional HMI involvement in professional programs as needed.

Final recommendations for any additional academic programs at the HMIs will need to be made following further discussions with the UNC Office of the President (particularly with its Academic Affairs division) and the institutions, since available data alone do not lead to automatic conclusions.

IV. INITIAL RECOMMENDATIONS ON FINDINGS FROM THE INTERIM REPORT (DECEMBER 2005)

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Current Educational Environment-NCCCS			
1. The North Carolina Community College System through its 58 colleges and numerous off-campus facilities provides accessible education opportunities for students. Ninety of North Carolina's 100 counties have community college facilities of some sort, approved by the State Board of Community Colleges. (see page 75 of Interim Report)	See Recommendation on p. 37 under Policy #1.		
2. Academic programs are comprehensive at all 58 colleges, ranging from basic literacy education through the first two years of a baccalaureate degree. (see page 75 of Interim Report)	The State Board of Community Colleges should reaffirm that the mission of community colleges in North Carolina is to provide academic programs from basic literacy education through the first two years of a baccalaureate degree and to the statutorily required emphasis on workforce education and training (technical and vocational) and adult education.	State Board of Community Colleges	2006
3. There is a State Board-approved process colleges use to plan and develop new programs. There is also a State Board policy on terminating low enrollment or inactive programs. (see page 75 of Interim Report)	The State Board of Community Colleges should reexamine its new program approval process to insure maximum nimbleness in responding to the needs of business and industry (see also p.37, Finding #3).	State Board of Community Colleges	2006
4. Curriculum programs are organized around system-wide standards and include ladder opportunities (i.e., certificate, to diploma, to degree) for students. This gives more students the opportunity to earn a credential and facilitates the transfer of students from one community college to another. (see page 75 of Interim Report)	The NCCCS System Office should continue to monitor and update system-wide standards.	NCCCS System Office	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. College transfer or liberal arts programs have not negatively impacted the statutorily required emphasis on workforce education and training (technical and vocational) and adult education. For the last five years, college transfer enrollment has consistently been about 22% of total curriculum enrollment. Conversion from the quarter system to the semester system several years ago has not negatively impacted workforce education and training. (see page 75 of Interim Report)	See Recommendation #2.		
6. The basic skills offerings in the community colleges are structured so as to allow progression to the next level within the same institution (i.e., educational ladder). (see page 76 of Interim Report)	The size and availability of basic skills programs should be assessed with the needs of dislocated workers and high school dropouts particularly in mind.	NCCCS System Office	2006
7. The Community College System provides a significant amount of education and training for business and industry through its continuing education programs. In addition, most of the training for public safety agencies at the local level—fire, emergency rescue, and law enforcement—is provided by community colleges. (see page 76 of Interim Report)	The NCCCS should continue to provide extensive education and training for business and industry and should examine the need for additional skill certification programs.	NCCCS System Office	2006
8. The BioNetwork initiative, the Community College System's component of North Carolina's focus on biotechnology, has been rapidly organized at the System level and among participating colleges over the past year. Collaboration with UNC and particularly NCSU and NCCU is a key part of this initiative. This collaboration has great potential for both systems and could serve as a model for future initiatives. (see page 76 of Interim Report)	The NCCCS should aggressively pursue additional opportunities to collaborate with UNC on initiatives that respond to the needs of emerging industries in North Carolina (See Recommendation #3, p.36)	- NCCCS System Office - UNC Office of the President	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
9. The funding process for community colleges is enrollment driven and has a one-year lag. Special funding to start new programs is usually not provided. This will continue to have a negative impact on planning and implementing new programs, particularly high cost offerings that will be needed to support the education and training needs of emerging industries. (see page 76 of Interim Report)	The state should establish a permanent revolving fund to incentivize community colleges to offer new or expanded programs that respond to high need and/or emerging industries. The fund should be in the \$2.5-3.0 million range and allocations for each program would be for its initial year (until formula funding takes over). It should be administered by the NCCCS System Office.	- Governor - Legislature	2006 Legislative Session
Current Educational Environment - University of North Carolina			
1. UNC makes its academic program array readily accessible to prospective students. (see page 81 of Interim Report)	UNC should continue to use all means, including electronic, to make information about its academic program availability to prospective students. It may wish to explore efforts to target specific audiences such as displaced workers.	UNC Office of the President	On-going
2. UNC institutions provide a wide range of academic offerings in all the major, traditional areas. These programs seem to be appropriately distributed across the institutions with relatively clear mission differentiation. For example, UNC includes a School for the Arts and a public liberal arts university (UNC Asheville). (see page 81 of Interim Report)	UNC should continue to encourage significant mission differentiation without inhibiting entrepreneurship. UNC may wish to reexamine each institution's mission to insure appropriate reference to its economic development role.	UNC Office of the President and UNC Board of Governors	2006
3. UNC institutions all offer a broad range of liberal arts majors. (see page 81 of Interim Report)	See Recommendations #1, 3, 4, 6, pp. 20, 21, 22		
4. UNC should continue its processes to minimize unnecessary and expensive duplication of specialized academic programs. (see page 81 of Interim Report)	UNC should continue its program review process, including its use of external evaluators on key programs, but should also consider proposals that emerge from Recommendation #8b., p.10.	UNC Office of the President	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. UNC institutions offer extensive academic programs in areas of current high state need. (see page 81 of Interim Report)	See Introduction		
6. UNC appears to offer a reasonable number of low demand academic programs that are desirable for offering a full academic array in the state. (see page 81 of Interim Report)	UNC should continue its annual process of reviewing low production programs and its analysis of the role those programs play in the overall academic program array.	UNC Office of the President	On-going
7. UNC institutions may not be offering identified academic programs in emerging fields as quickly as some other states, although such programs may indeed be imbedded in existing programs. (see page 81 of Interim Report)	UNC should examine how some states (for example, New York, Texas, California) have packaged, marketed and funded academic programs in emerging fields (such as nanotechnology).	UNC Office of the President and selected UNC institutional academic leaders	2006
8a. UNC should increase its efforts to expand cooperative degree programs and collaborative programs, both within UNC and NCCCS. These efforts would be accelerated by special incentive funding from the state.	See Recommendation #3, p.36		
8b. UNC should work with the institutions to implement some modification to the program approval process to allow greater nimbleness in responding to new programs that respond to economic transformation initiatives, especially in emerging areas. Such a modification might include: - creating "incubator" degrees with fast-track approval for an initial period. - Redesign of certain masters and Ph.D.'s in accelerated programs, including use of technology. (see page 81 of Interim Report)	A group of institutional CAOs should be formed, chaired by an institutional CAO, to produce specific recommendations for modifications to the program approval process. Some of the recommendations may include proposed pilot programs.	UNC Office of the President as convener only.	Spring 2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Remedial Education – UNC/NCCCS 9. While remedial education <i>appears</i> to have declined in the UNC, it is difficult to draw a definitive conclusion as each UNC institution sets its own placement standards. Also, some do not offer formal remediation instruction (UNC Asheville and UNC Charlotte offer skill labs; UNC Chapel Hill provides summer bridge programs). As a consequence, remedial programs are not reflected in the enrollment data. (see page 81 of Interim Report)	UNC should consider revising its approach and its reporting of remedial education. A process should be established to consider a common placement tool for remedial education in UNC and a common minimum score for such placement. It would be useful if that tool could be cross-walked with a compatible common tool in NCCCS. The methods of providing remedial education would remain the province of the institutions. With a common placement tool and score, UNC would then be able to report reliably on trends in the need for remediation. In addition, the reports should disaggregate the percentage of students needing remediation who are recent high school graduates and share with each North Carolina school the percentage of its recent high school graduates requiring remedial education.	- UNC Office of the President in collaboration with NCCCS System Office - P-16 Council (see #4, page 33)	2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
10. It is likely that a significant percentage of freshman students in UNC require formal remedial instruction (at least double digits and perhaps as high as one in five). When non-formal remedial activities are included, an even higher proportion of students require remediation. This adds to the cost of UNC and to the time to degree of such students. It also reduces their chances of being successful. It is unlikely that North Carolina can build a workforce for the knowledge economy without significantly decreasing the proportion of students who enter higher education requiring remediation instruction. Particularly disturbing is the proportion of students who require remediation in math since much of the knowledge economy, with its technology and science emphasis, requires strong math skills. (see page 82 of Interim Report)	The percentage of students requiring remediation in NCCCS must be significantly reduced. The revised P-16 approach (see #4, p.38) should adopt the reduction of remediation in both NCCCS and UNC as its first project.	• P-16 Council	On-going
11. The trends for students requiring remediation in the NCCCS are disturbing. Since 1999-00, the range of students needing remediation has been between 48.6% (2000-01) and 54.3% (2001-02) with no real pattern of decline. (see page 82 of Interim Report)	The percentage of students requiring remediation in NCCCS must be significantly reduced. The revised P-16 approach (see #4, p.38) should adopt the reduction of remediation in both NCCCS and UNC as its first project.	• P-16 Council	On-going
12. Approximately half of the students in the NCCCS require formal remedial instruction. As with the UNC students, the highest proportion of NCCCS students require remediation in math. This is equally troubling because more and more community college programs require increased levels of skill and knowledge in technology and math. (see page 82 of Interim Report)	The percentage of students requiring remediation in NCCCS must be significantly reduced. The revised P-16 approach (see #4, p.38) should adopt the reduction of remediation in both NCCCS and UNC as its first project. Included in the initiative outlined in 11 above should be a special emphasis on strengthening math skills of students graduating from the K-12 system.	• P-16 Council	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Other Services - UNC			
13. UNC institutions offer an extensive array of non-credit programs that include some activities to assist lifelong learning and career changes. (see page 82 of Interim Report)	UNC should reexamine its non-credit programs to insure an appropriate number are targeted to skills and knowledge for career development and to targeted audiences (such as displaced workers).	UNC Office of the President	2006-2007 Academic Year
14. UNC has a robust Small Business Technology Development Center, dispersed throughout the state that provides services to small and medium businesses and provides a substantial return on investment for the state. (see page 82 of Interim Report)	UNC should continue to support the SBTDC and find ways for it to collaborate with the NCCCS Small Business Center Network.	UNC Office of the President	2006-2007 Academic Year
Selected Partnerships and Collaborative Initiatives			
1. Both UNC and the Community College System have state-level governing boards. They have shown a strong interest in developing partnerships and collaborative initiatives that lead to improved educational opportunities for students. (see page 86 of Interim Report)	A small, joint committee, with membership from both the UNC Board of Governors and the State Board of Community Colleges should be created. This committee should meet quarterly and be charged with identifying collaborative opportunities and with resolving any collaborative issues between the two systems.	- Board Chair, UNC Board of Governors - Board Chair, State Board of Community Colleges	February 2006
2. The two governing boards in late 2004 accepted the recommendations of the Task Force on UNC/NCCCS Partnerships and have started implementing the recommendations. (see page 86 of Interim Report)	The two governing boards should revisit the Task Force's 2004 report with its 25 recommendations, using it as a starting point for establishing an on-going process of seeking ways the two systems can collaborate. The Joint Committee recommended above (#1) should be charged with leading this process.	- Board Chair, UNC Board of Governors - Board Chair, State Board of Community Colleges	February 2006
3. UNC and NCCCS should continue to submit joint budget requests to the General Assembly; priority should be given to funding recommendations emerging from the HB1264 study. (see page 86 of Interim Report)	The Boards' Joint Committee should, through its work called for above (#1 and 2), be charged with helping develop joint budget requests for future sessions of the General Assembly.	Boards' Joint Committee	On-going

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
4. UNC and NCCCS should jointly produce an annual report to the General Assembly, their respective boards, and the general public. This report should be developed using a template for such partnerships to insure consistency of information. It should also identify those partnerships that have the capacity to be replicated. (see page 86 of Interim Report)	The Boards' Joint Committee (see p.13, #1) should jointly produce an annual report to the General Assembly, their respective boards, and the general public. This report should be developed using a template for such partnerships to insure consistency of information. It should also identify those partnerships that have the capacity to be replicated. The report should include a section on facilities sharing.	The Boards' Joint Committee	2006-2007 Academic Year and annually thereafter
5. Many collaborative activities between UNC institutions and the community colleges are quietly going on behind the scenes. However, many of them have great potential for students in both systems. One example is the development of 2 + 2 online collaborative programs in selected disciplines or majors. Students will be able to take the first two years online from a Community College and the upper division work online from a UNC institution. (see page 86 of Interim Report)	The Boards' Joint Committee should find ways to expand collaborative programs between UNC institutions and the community colleges and to share best practices from those programs.	The Boards' Joint Committee	On-going
Enrollment Projections 1. Both the NCCCS and UNC maintain ten-year enrollment projections. However, the NCCCS does not disaggregate its data by institution, although it does incorporate all elements of its instruction (not just the credit producing programs); the absence of individual campus projections may inhibit regional planning for workforce production. While the UNC does disaggregate by institution, it does not provide projections for continuing education. (see page 88 of Interim Report)	NCCCS should expand its enrollment projections by working with the individual community colleges to develop ten-year projections at both the system and college levels. UNC should expand its enrollment projections by including continuing education enrollment projections as an additional element in its projection models.	- NCCCS System Office - UNC Office of the President	Fall 2006 Fall 2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
2. While both systems project significant enrollment increases, the current models do not anticipate major shifts in current enrollment patterns (for example, major changes in age cohorts participating in higher education; significant changes in retention rates). The UNC models could be easily adapted to examine these changes at the appropriate time and do examine such items as changing demographics by county. (see page 88 of Interim Report)	Both NCCCS and UNC should develop enrollment projection models that can reflect major shifts in enrollment patterns (such as increased retention rates, changes in participation rates by particular age groups, and other changes anticipated as a result of HB1264 recommendations).	- NCCCS System Office - UNC Office of the President	Fall 2006 Fall 2006
3. The increase in the projected graduate student enrollment has positive implications for the new economy, which will require a more highly educated workforce. (see page 88 of Interim Report)	See Recommendation #6, p.38. The Governor and legislature should permit UNC to waive out-of-state and/or all tuition for graduate assistants and/or graduate students in high demand fields, as many states do.	Governor or Legislature	2006 Legislative Session
Distance Learning: UNC and NCCCS			
1. The number of programs and courses offered through distance learning is growing rapidly for the NCCCS and UNC. (see page 98 of Interim Report)	UNC and NCCCS use different definitions for what it classified as distance learning, as well as different taxonomies for sub-categorization of distance learning. There should be a joint study group appointed by the Presidents of UNC and NCCCS to develop a common: - definition of distance learning, e-learning, etc. - taxonomy that allows intra- and inter-system comparisons and comparisons with external benchmarks. - mechanism for ensuring that the taxonomy is applied consistently across campuses. A resource used in the study should be the taxonomy used by the Southern Regional Education Board.	- NCCCS System Office - UNC Office of the President	May 2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
2. Student enrollment in distance learning programs and courses is growing rapidly for both UNC and the NCCCS. (see page 98 of Interim Report)	UNC and NCCCS should establish on-going and dynamic strategic and tactical planning processes for distance learning at the system level. The system offices (UNC and NCCCS) should perform planning capacity studies and then each institution and the system offices should be resourced to undertake this type of on-going planning process. The planning process should address the issues of rural access, providing access for students with limited English language abilities, and providing access for disabled students. UNC should identify obstacles to furthering the development of distance learning (e.g., promotion and tenure guidelines that do not properly recognize distance learning development, teaching, and scholarship; lack of a formalized mechanism of assessing workforce market needs; and procedural and institutional roadblocks to collecting more granular or detailed distance learning data). NCCCS should develop a human resource (staffing) plan and request the funding needed to address existing capacity constraints for distance learning planning and should formalize and expand its existing assessment of workforce market needs. The planning processes for UNC and NCCCS should address the issues of rural access, access for students with limited English language abilities, and providing access for disabled students.	- UNC Office of the President - NCCCS System Office	Fall 2006
FINDING	RECOMMENDATION	RESPONSIBLE	TIMETABLE

		PARTY	
2. Student enrollment in distance learning programs and courses is growing rapidly for both UNC and the NCCCS. (see page 98 of Interim Report) <i>(continued)</i>	A joint distance learning planning/oversight committee, comprised of institutional and system-level representatives, should be appointed by the two system Presidents to ensure that collaborative initiatives are explored and implemented.		
3. Both UNC and NCCCS appear to offer a greater percentage of courses through distance learning than national averages. (see page 98 of Interim Report)	This finding should be verified by further analysis including use of SREB data.	• UNC Office of the President • NCCCS System Office	Spring 2006
4. The level of involvement in distance learning activities varies widely with each university or community college. (see page 98 of Interim Report)	See Finding #5 below		
5. The scope of support, and the facilities and personnel provided for content development, vary considerably with each institution. (see page 98 of Interim Report)	NCCCS should develop the support infrastructure needed to ensure that distance learning meets expectations of students and industry with regard to quality and mode of instruction (e.g., simulations); to ensure that faculty are supported in the development of high quality course content; and to ensure that students are supported with high quality help-desk, counseling, and other services. This support infrastructure should include at least one full-time instructional designer at each college and a core of support designers at the System Office level. Shared call center services should be considered, as well as centralized or regional hosting of servers 24/7/365. A flexible Course Management System with the ability to accommodate reusable learning objects should be established.	• NCCCS System Office	2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. The scope of support, and the facilities and personnel provided for content development, vary considerably with each institution. (see page 98 of Interim Report) (<i>continued</i>)	Evidence collected during this study indicates that UNC, as a whole, has a more robust infrastructure and support system for distance learning than does the NCCCS. The UNC President should appoint a special study group to further analyze and verify this and to explore opportunities to provide shared services among campuses.	UNC Office of the President	2006
6. The demands on the UNC and NCCCS networking infrastructure continue to grow, due to increased numbers of course offerings and student enrollments, as well as the offering of more technologically demanding content presentations. (see page 98 of Interim Report)	See Finding #7 below		
7. The present NCCCS network is near capacity for the distance learning offerings currently supported, creating a growing hurdle for expanding the scope or quantity of distance learning courses as well as planning future joint initiatives with the UNC. (see page 98 of Interim Report)	Anecdotal evidence suggests a clear and pressing need for additional bandwidth for the entire NCCCS. The NCCCS System Office should develop a formal business case approach for funding requests to the General Assembly for additional bandwidth that takes into account current bandwidth utilization, enrollment projections, demands of new forms of course content such as simulations, and benchmarks from similar systems and college associations. The NCCCS System Office should appoint a work group, comprised primarily of college representatives, to accurately ensure bandwidth resources and utilization. UNC should continue to analyze bandwidth usage and requirements for its institutions.	- NCCCS System Office - UNC Office of the President	2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Student Mobility			
1. The Comprehensive Articulation Agreement (CAA), developed by the two systems and approved in 1997 by the UNC Board of Governors and the State Board of Community Colleges, has significantly improved the transfer process for community college students to UNC institutions; in addition, the number of students transferring from a Community College to another Community College has dramatically increased. (see page 103 of Interim Report)	The Transfer Advisory Committee, composed of representatives of UNC and NCCCS (with a private college representative), should continue its work to improve the transfer process for students. As recommended by the Task Force on UNC/NCCCS Partnerships, funds should be sought from the General Assembly to establish full-time staff support for the committee.	Transfer Advisory Committee General Assembly (for funding request)	On-going
2. A study was recently done by MGT of America of the CAA and its impact on the transfer process. The study stated that the CAA is "widely perceived as indeed having improved the transfer of associate in arts and associate in science degrees. It is perceived that the primary strengths of the CAA include standardizing the transfer process and providing students with a path and plan for transferring. Quantitative data support that a greater number of students are transferring between North Carolina community colleges and UNC institutions." (see page 103 of Interim Report)	Following the completion of any revisions to the CAA and the implementation of the MGT recommendations (see #3 below), UNC and NCCCS should jointly review the transfer process (including a transcript analysis, which was not included in the MGT study).	- UNC Office of the President - NCCCS System Office	2007-2008 Academic year
3. Numerous changes and enhancements were recommended in the MGT of America study and are being addressed by the UNC Board of Governors and the State Board of Community Colleges. These changes will strengthen the CAA and improve the transfer process for Community College students. (see page 103 of Interim Report)	The Boards' Joint Committee should review the progress on the implementation of the MGT recommendations and should assume responsibility for their oversight.	The Boards' Joint Committee	2006

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
4. Over the past four reporting periods, NCCCS transfers to UNC institutions have increased by 27.1%. Students that transferred without the associate degree showed a larger increase (35.5%) than those with the associate degree (14.7%). A dip in Fall 2003 transfers with the associate degree was followed in Fall 2004 by a significant increase. The Fall 2003 dip may be a reporting anomaly attributable to a new information system implemented by the NCCCS over the past several years. (see page 103 of Interim Report)	The Boards' Joint Committee should examine initiatives that would further increase the number of NCCCS students who transfer to UNC. It should also identify any remaining barriers to transfer.	The Boards' Joint Committee	2006-2007 Academic Year
5. The CAA does not apply to transfer among the UNC institutions. The general education core of one UNC institution does not automatically transfer as meeting the general education core at another UNC campus. This may inhibit the mobility of students from one university to another (unless the institutions already do so informally). (see page 103 of Interim Report)	UNC should require each of its institutions to accept the completed general education requirements from another UNC institution as meeting its own general education requirements. (Note: this recommendation calls for acceptance, not uniformity, so as to encourage student mobility while celebrating institutional differences.)	UNC Office of the President in consultation with the UNC institutions	2006-2007 Academic Year
The Role of Liberal Arts			
1. Both NCCCS and UNC institutions have significant requirements in the Liberal Arts. (see page 106 of Interim Report)	See Recommendations #4, 5 on the next page. A joint summit between UNC and NCCCS should be held to discuss the future of the liberal arts, utilizing the information that comes from the activities recommended in item #4 below.	- UNC Office of the President - NCCCS System Office	Spring 2006
2. The general education core from the community colleges transfers as a block to other NCCCS institutions and to all UNC institutions. (see page 106 of Interim Report)	See Recommendations #4, 5 on the next page.		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
3. The general education core varies considerably from one UNC institution to another. (see page 106 of Interim Report)	The general education core should continue to have variety but should be fully transferable (see Recommendation #5 below)		
4. The general education core does not transfer automatically from one UNC institution to another. (see page 106 of Interim Report)	UNC should establish a process to require each of its institutions to reexamine the current general education requirements in light of the skills and knowledge identified as being necessary for success in the 21 st century. This process might begin with the identification of such skills and knowledge by a largely external and diverse group (business, industry, non-profit, government sectors) to inform the discussions at the institutional level. See Recommendation #5 below.	UNC Office of the President	2006-2007 Academic Year
5. The NCCCS general education core was largely developed nearly a decade ago and has not undergone a comprehensive review and revision since then. The increased demand for “soft skills” at all levels may also suggest the need to reexamine the role of general education in associate in applied science degrees, especially as they serve more students who will later seek other degrees. (see page 106 of Interim Report)	- Similar to the process recommended in #4 - NCCCS should establish a process to update its general education core for transfer programs, utilizing the information presented by the external group identified in recommendation #4. Its review and revision of its general education core should be conducted in conjunction with UNC to insure the continued full transferability of the core to all UNC institutions. - NCCCS should establish a process to reexamine the general education component of its associate in applied science degrees, since an increasing number of these degrees are likely to transfer to UNC primarily through articulation agreements either at the UNC level or with individual UNC institutions.	- NCCCS System Office in consultation with the community colleges - NCCCS System Office in consultation with the community colleges	2006-2007 Academic Year 2006-2007 Academic Year

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
6. Neither the NCCCS nor the UNC institutions' general education core has a clear articulation of its aims or of the skills and knowledge required. Furthermore, it is not clear that there is sufficient emphasis on developing the "soft skills" in either the general education curriculum or other areas of the curriculum. This has important implications for the preparation of the workforce in a global knowledge economy. (see page 106 of Interim Report)	• Same as #4 • NCCCS should establish a process to update its general education core for transfer programs, utilizing the information presented by the external group identified in recommendation #4. Its review and revision of its general education core should be conducted in conjunction with UNC to insure the continued full transferability of the core to all UNC institutions.	• NCCCS System Office in consultation with the community colleges and business and industry	
The Role of Historically Minority Institutions (HMI's) 1. The HMIs have benefited enormously from the focused growth initiative, taking considerable advantage of the opportunities presented them. They have been transformed in size, in range of academic programs, and in facilities in a remarkably short period. While the investment has been substantial, the returns already appear to justify both the dollars and commitment to these institutions. Other states have attempted to strengthen their HMIs, but it is hard to imagine any program that has been more successful than this one. (see page 109 of Interim Report)	See Section III		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
2. The HMIs have not all managed to take equal advantage of the focused growth program (some have more challenging environments than others). For example, the rate of enrollment growth has a very wide range, not all of them have added academic programs that will be in high demand, and the increase in funded research has not been uniform. (see page 109 of Interim Report)	See Section III		
3. The HMIs have experienced an unprecedented growth in academic programs, both at the bachelors and masters level. Most of these programs have been in high demand fields. For example, nursing, biotechnology, MBA, and computer science all received focused growth planning funds at Winston-Salem State University; all four of these programs have been identified as high state need programs by this study. (see page 109 of Interim Report)	See Section III		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
4. The HMIs have put special emphasis on academic programs in the sciences, where there are likely to be overall shortages and where minorities are traditionally seriously underrepresented, yet where increasingly the best employment opportunities are to be found in the knowledge economy. (see page 109 of Interim Report)	See Section III		
5. The HMIs are critical to the economic future of the state. Not only are minority (and immigrant populations) increasing at a rate above that of whites (this growth is above the national average in North Carolina, although much of the projected increase is Hispanic), but also these institutions are assuming an increasingly important role in addressing the overall enrollment and economic development needs of the state. (see page 110 of Interim Report)	See Section III		
6. The HMIs have considerable ambitions to continue to add new academic programs. This is understandable given their success to date. They are, however, experiencing some challenges as a result of the rapid growth, including managing the faculty recruitment and orientation process and managing infrastructure growth at the same time. Budget and tuition limitations may also impact their ability to secure additional programs, especially those that are high cost programs. Thus the selection of additional programs will need to be paced appropriately and selected strategically, especially as it relates to responding to demonstrated high occupational needs. (see page 110 of Interim Report)	See Section III		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Preliminary Gap Analysis: State Needs/Academic Programs-UNC 1. UNC institutions are not currently producing a sufficient number of bachelors degrees for the projected needs in the following high demand areas, although the projected gaps need to be understood within the context of the issues cited in the paragraph that follows: • Teacher Education (annual gap of 2,517 or 9,170, depending on study) • Nursing (annual gap of 2,655) • Computer Science (annual gap of 1,106) • Accounting (annual gap of 308) • Recreation Workers (annual gap of 117) It should be noted that the NCCCS has 54 Associate Degree nursing programs and that 1,965 graduated from these programs in 2004-2005. Without taking into consideration the type of RN (i.e., BSN or ADN), this significantly reduces the gap, but still leaves an annual gap of several hundred registered nurses. Also, computer science may be overstated because the trend years used for the projections include the years of the computer "boom." Conversely, the need for the accounting degree may be understated because the trend years preceded Sarbanes/Oxley requirements for corporate accounting and auditing. Both teacher education and nursing have been the topic for major supply/demand reports in the last year; these reports both include specific recommendations for responding to the projected shortages. (see page 122 of Interim Report)	See Section II		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
2. UNC institutions are currently producing sufficient graduates for the projected needs in the following high demand areas: • Business However, students have a number of other choices for careers in business beyond those identified as high demand. So there may or may not be a sufficient supply for those fields. (see page 122 of Interim Report)	See Section II		
3. UNC institutions produced the largest number of graduates in 2005 in most of the projected high demand areas, which is a significant change from the 2004 data. (see page 122 of Interim Report)	See Section II		
4. UNC institutions are not currently producing a sufficient number of masters degrees for the projected needs in the following high demand areas: • Rehabilitation Counseling (annual gap of 273) • Market Research (annual gap of 78) • Physical Therapy (annual gap of 66) (see page 123 of Interim Report)	See Section II		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. UNC institutions are currently producing a sufficient number of masters degrees in the following high demand areas: • Health Specialties Post-secondary Teachers (as long as the fields are appropriately distributed) • Business Post-secondary Teachers (as long as sufficient masters graduates choose this field) • Library Science • Education and Vocational Counselors (see page 123 of Interim Report)	See Section II		
6. The masters degree may be emerging as a key degree in some academic areas for employment. UNC has a major initiative to create more professional science masters degrees and has received Sloan Foundation funding for parts of this activity. (see page 123 of Interim Report)	See Recommendation #6, p.38 and Section II.		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
7. The demand for higher education faculty is likely to increase substantially, especially in fields like math, science, and technology. While not all fields nor all higher education institutions will require faculty with doctorates, the number of doctorates will likely need to increase. The faculty marketplace tends to be a national one, so the gaps in the high demand fields in North Carolina cannot be taken as absolute. For one thing, the national reputation of higher education in North Carolina and quality of life issues make North Carolina an attractive destination for prospective faculty members. On the other hand, the national marketplace may see a decline in doctorates if predicted trends in some key fields (such as math, science, engineering, and computer science) develop, such as a reduction in the number of international students coming to U.S. universities and an increase in the percentage of those students who return to their home countries. China and India, for example, intend to train many more of its own doctorates. (see page 123 of Interim Report)	See Section II		
8. There are gaps in the need for Ph.D.s in the medical sciences (annual gap of 29) and clinical, counseling, and school psychologists (annual gap of 76). Nursing Ph.D. production, while a national issue, deserves particular attention. (see page 123 of Interim Report)	See Section II		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
9. There are substantial gaps in the production of professional degrees: ▪ Pharmacy (annual gap of 154) ▪ Doctors (annual gap of 124) ▪ Lawyers (annual gap of 94) ▪ Dentists (annual gap of 67) ▪ Veterinarians (annual gap of 27) (see page 124 of Interim Report)	See Section II		
10.a. In the emerging industries and/or the industries that are part of regional initiatives, UNC institutions will need to produce sufficient graduates especially in the life sciences and computer sciences particularly for the biotechnology and pharmaceutical industries. It appears that UNC institutions are responding to this need, particularly in biotechnology. (see page 124 of Interim Report)	See Section II		
b. In the emerging industries and/or the industries that are part of regional initiatives, UNC institutions will need to produce sufficient graduates with either specialized or interdisciplinary skills in such areas as business and engineering. While the institutions are producing sufficient graduates in those fields, they may need to reexamine the curriculum and/or the need for new concentrations, specialized certificates, or masters programs. This is true for the logistics and distribution industry; advanced manufacturing; and chemical and plastics. (see page 124 of Interim Report)	See Section II		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
c. In nanotechnology, UNC institutions do not presently have as many programs available as do the leading states. (see page 124 of Interim Report)	See Recommendation #7, p.10		
d. In arts and design there are great possibilities for expanding both employment opportunities and quality of life issues that can be central to economic development. A number of UNC institutions have identified this as a growth area.. (see page 124 of Interim Report)	See Section II		
e. In virtually all gap areas (from traditional fields like nursing and teaching to emerging fields like nanotechnology and logistics) there are great opportunities for expanded partnerships and "ladder" programs between NCCCS institutions and UNC institutions. There are a number of such existing programs and prototypes, including some that use e-learning exclusively. Thus the primary issue is one of scaling up such activities and program availability. (see page 124 of Interim Report)	A permanent joint committee of selected chief academic officers from institutions in each system should be appointed. This joint committee should be co-chaired by the CAO of each system and should meet quarterly. An early project for the joint committee would be examining ways to expand partnerships and ladder programs. See also Recommendation #3, p.36	• CAO, UNC Office of the President and CAO, NCCCS System Office	2006-2007 Academic Year

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Preliminary Gap Analysis: State Needs/Academic Programs-NCCCS 1. Community Colleges are not producing an adequate number of graduates to meet projected needs in the following high demand areas: • Registered nurses (see prior discussion in UNC section) • Office staff – including executive secretaries, administrative assistants, and so on. (annual gap of several hundred, depending on how projected needs are viewed) • Computer programmers (annual gap of 295 at associate degree level) • Emergency medical technicians (annual gap of 90) • Legal secretaries (annual gap of 329 at associate degree level) • Medical and clinical lab technicians (annual gap of 146) • Aircraft mechanics and service technicians (annual gap of 205 at associate degree level) • Surveying and mapping technicians (annual gap of 156) • Medical transcriptionists (annual gap of 45) It should be noted that as technology becomes more embedded in the workplace, it will have impacts that are difficult to precisely measure at this time. For example, as the information needed and used by health care providers (for example, medical records) becomes digitized, it will have a dramatic impact on those work places, including the skills needed by workers. (see page 125 of Interim Report)	See Section II		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
2. According to the occupational projections developed in this study using ESC data, the NCCCS is not producing an over supply of graduates in any of the high growth areas. (see page 125 of Interim Report)	See Section II		
3. The NCCCS is responding to the targeted industries that emerge from the trend data (e.g., biotechnology and pharmaceuticals), though its responses are in the early stages. The BioNetwork initiative is in its second year of operation and has offered significant opportunities for collaboration with UNC institutions, particularly North Carolina State University. This should serve as a model as other emerging industries (for example, nanotechnology) expand and present the need for increased numbers of trained workers. (see page 125 of Interim Report)	See Section II		
4. As noted in the UNC section above, there are many opportunities for new and expanded partnerships between the two public higher education systems. Addressing the needs in some critical areas, such as increasing the supply of teachers and nurses, has more to do with building new and better collaborative programs than with building new bricks and mortar facilities. (see page 125 of Interim Report)	See Recommendation #10c., p.30		
5. Distance learning options should be a critical consideration in all plans to expand programs, to develop collaborative arrangements, or to provide new services. This should apply to both systems. (see page 125 of Interim Report)	See Section II		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Additional Topics: Technology Transfer			
1. UNC institutions are trending upward on total research awards (21%), federal research (65.4%), and industry sponsored research (29%). However, business and industry outside of North Carolina have fueled that growth; industry-sponsored awards from North Carolina business and industry have declined 16%. (Note: some data definition changes might have impacted to some degree these percentages.) (see page 135 of Interim Report)	See Appendix		
2. UNC institutions are, in relation to the overall research activity, only minimally involved in joint research with North Carolina business and industry. This equates at best to 1% of the total research amount awarded. (see page 135 of Interim Report)	See Appendix		
3. North Carolina selected institutions (Duke University, East Carolina University, North Carolina State University, UNC Chapel Hill, UNC Charlotte, and Wake Forest University) at \$2.2M per invention disclosure, were more efficient than the national average in both years examined (national averages \$2.4M in FY 2000 and \$2.5M in FY 2003.) (see page 135 of Interim Report)	See Appendix		
4. North Carolina selected institutions ranked second of seven states (behind only Virginia) examined in 2003 in efficiency of invention disclosures. In 2000, North Carolina was behind Virginia and Massachusetts and ahead of Georgia, Pennsylvania, Texas, and Michigan.) (see page 136 of Interim Report)	See Appendix		
5. North Carolina selected institutions, at \$6.7M in 2003 and \$6.5M in 2000 per license, were more efficient than the national average in both years examined. (see page 136 of Interim Report)	See Appendix		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
6. North Carolina selected institutions ranked second of seven states in both years (behind Virginia) in their efficiency at converting research dollars into licenses. (see page 136 of Interim Report)	See Appendix		
7. North Carolina selected institutions are above the national averages in both 2003 and 2000 (more so in 2003), for research dollars expended per university start-up company created. North Carolina institutions expended \$88M in 2003 compared to a national average of \$100M. (In 2000, it expended \$66M compared to the national average of \$70M.) (see page 136 of Interim Report)	See Appendix		
8. North Carolina selected institutions ranked fourth (behind Massachusetts, Virginia, and Georgia) in their efficiency at converting research dollars into start-up companies created. They ranked fifth in 2000. (see page 136 of Interim Report)	See Appendix		
Additional Topics: Research			
1. UNC Chapel Hill ranks 17 in total research expenditures by public universities (2002 data), followed by North Carolina State University (21), North Carolina A&T (171), UNC Wilmington (175), and East Carolina University (189). (see page 136 of Interim Report)	See Appendix		
2. UNC Chapel Hill also ranks very high (10) on federal research expenditures by public universities (2002 data), with a larger gap before the next institution; University of North Carolina State University (60). These two institutions were followed by North Carolina A&T (150), UNC Wilmington (163), and East Carolina University (189) (see page 136 of Interim Report)	See Appendix		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
3. The two primary doctoral research universities (UNC Chapel Hill and North Carolina State University) have strong national rankings. They, and many of the other UNC institutions with smaller funded research programs, have developed areas of specialization in such fields as life sciences, which should have positive implications for supporting a number of the identified emerging industries in North Carolina.. (see page 136 of Interim Report)	See Appendix		
Additional Topics: Campus Culture and State Support for Innovation			
1. UNC has begun initiatives to address insuring a campus culture at each of its institutions that supports innovation and entrepreneurship. While progress has been made, much work remains to be done. (see page 137 of Interim Report)	See Appendix		
2. North Carolina has traditionally provided very substantial support for its universities in general and has gained a national reputation as a result. However, a number of competitor states have made more substantial state investments in specific programs aimed at maximizing the partnerships among the state, its universities, and targeted businesses and industries. (see page 137 of Interim Report)	See Appendix		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
Other Preliminary Findings			
Funding: 1. The funding formula for the NCCCS does not provide a financial incentive for developing or expanding academic programs in the areas of high state need. These programs are often high cost programs. While the UNC funding formula recognizes discipline cost differences, it does not recognize the high start up or expansion costs of such programs. (see page 138 of Interim Report) 2. The funding formulas of both NCCCS and UNC need to be updated to reflect the realities of 21st century higher education. Specifically, full formula funding should be provided year round and for all types of delivery (for example, e-learning). (see page 138 of Interim Report) 3. The legislature should create a collaborative funding initiative to incentivize more program collaboratives between UNC and NCCCS institutions. (see page 138 of Interim Report) 4. With a high school drop-out rate in excess of 40%, North Carolina has a high need for basic skills programs. While the NCCCS has an extensive and successful program, it will not meet the future needs. (see page 138 of Interim Report)	See Recommendation #9, p.9 (for NCCCS recommendation) The state should establish a revolving fund to incentivize UNC institutions to offer new or expanded programs that respond to high need and/or emerging industries. The fund should be in the \$2.5-3.0 million range and allocations for each program would be for its initial year (until formula funding takes over). It should be administered by the UNC Office of the President.	- Governor - Legislature	2006 Legislative Session
	The funding formula for both UNC and NCCCS should fully fund all instruction, regardless of when and how it is offered. This will provide more incentive to use the physical plant year round and to expand access through e-learning.	- Governor - Legislature	2006 Legislative Session
	A permanent, revolving collaboration fund of \$10 million should be established. Priority should be given to funding programs in high need areas and in emerging industries. The fund should be administered by both Presidents and approved by both Boards.	- Governor - Legislature	2006 Legislative Session
	See Recommendation #6, p.8		

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
5. State budget priorities and shortfalls will require higher education to diversify its resource base. (see page 138 of Interim Report)	A state summit should be held on the resource issue. This summit could explore best practices from elsewhere on increasing entrepreneurship, on state incentives for alternative resources, on removing state mandates that do not add significant value, and on the appropriate future role of the state in funding higher education. The summit should include national experts and should involve state legislative and state business leaders, as well as the academic community.	• President, UNC • President, NCCCS	2006
<u>Policy:</u> 1. UNC and NCCCS should work together to define the need for additional higher education sites. First priority should be given to expanding the use of existing facilities (e.g., extension offices, public libraries, etc.). (see page 138 of Interim Report)	A joint Task Force of leadership from both UNC and NCCCS should be formed to define the need for additional higher education sites and to propose a joint policy framework.	• President, UNC • President, NCCCS	Task Force formed in January 2006; recommendations due May 2006
2. Each system should notify the other system of new academic programs that are in development so that possible collaborative programs could be identified early in the process. (see page 138 of Interim Report)	Both UNC and NCCCS should modify their new academic program approval process to include an early notification step to the other system.	• UNC Office of the President • NCCCS System Office	Spring 2006
3. NCCCS should be immediately removed from the rule-making of the state so as to increase its ability to respond to program needs in a timely manner. All barriers to nimble responses to economic transformation must be eliminated. (see page 138 of Interim Report)	NCCCS should be removed from the rule making requirements of the Administrative Procedures Act (as is UNC).	• Legislature	2006 Legislative Session

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
4. With leadership from UNC, NCCCS, and DPI, a new state-wide P-16 Council should be formed that includes business leaders and others. Best practices in P-16 should be examined in states such as Maryland and Georgia. States that have recently reinvested and expanded their P-16 efforts, such as Ohio, should also be examined. The state-wide P-16 Council should lead to the establishment of Regional P-16 Councils. (see page 139 of Interim Report)	North Carolina should form a statewide P-16 Council with membership from stakeholders of education at all levels, including business and industry. (See Ohio's recently appointed group as an example.) The Council should meet quarterly and address issues that cut across educational systems (see, for example, Recommendations 10-12, p.12)	• President, UNC • President, NCCCS • Superintendent, DPI • President, NCAIC	Spring 2006
5. North Carolina should adapt a program for reciprocal in-state tuition with bordering counties in other states. (see page 139 of Interim Report)	North Carolina should pass legislation allowing out-of-state students in counties that border North Carolina to pay in-state tuition. If the state chooses, it could implement such a program on a pilot basis.	• Governor • Legislature	2006 Legislative Session
6. With the associate degree replacing the high school diploma as an entry level qualification for many occupations, the role of the bachelors degree and particularly the masters degree is changing. The need for the masters may even be proportionately higher than the need for students with bachelors. At the same time, many people with bachelors degrees may seek a specific diploma or certificate from a community college at some point in their careers. (see page 139 of Interim Report)	UNC should appoint a Task Force to examine the expansion of masters degrees and the design of these degrees. NCCCS should appoint a joint Task Force to examine making its programs fully accessible to students with undergraduate and graduate degrees.	• UNC Office of the President • NCCCS System Office	2006-2007 Academic Year
7. North Carolina, like all states, has achievement gaps between its white and Asian students and African-American, Hispanic, and Native American students. Even though African-American and Native American participation rates in college are similar to whites, minority students do not have as high graduation rates for undergraduates nor the participation rates in graduate programs. (see page 139 of Interim Report)	The statewide P-16 Council should launch a study, with the help of external expertise, to address the achievement gap. This should be a study funded by the Legislature and the Governor.	• P-16 Council • Governor • Legislature	2006-2007 Academic Year

FINDING	RECOMMENDATION	RESPONSIBLE PARTY	TIMETABLE
8. Current financial aid policies do not adequately address the financial needs of students taking multiple courses in joint programs at different campuses, as well as joint UNC and NCCCS programs. (see page 139 of Interim Report)	A joint study group, consisting primarily of financial aid officers, should be established to examine ways to remove financial aid barriers to students taking joint programs.	- UNC Office of the President - NCCCS System Office	Spring 2006
9. Not all academic program expansions are initiated by UNC based solely on need and existing/projected data; external program initiatives can undermine the integrity of the academic program review process. (see page 139 of Interim Report)	All academic program initiatives and decisions should normally be initiated from within UNC and/or NCCCS institutions.	UNC and NCCCS institutions	On-going
10. UNC and NCCCS should both develop a "one-stop" access point for business and industry to their respective assets. This should be an electronic portal and each system's should link to the other. (see page 139 of Interim Report)	UNC and NCCCS should both develop a "one-stop" access point for business and industry to their respective assets. This should be an electronic portal and each system's should link to the other.	- UNC Office of the President - NCCCS System Office	2006
11. There is a history of collaborative policies and agreements for joint academic programs and shared facilities between UNC and NCCCS; these could be expanded. (see page 139 of Interim Report)	See Recommendation #4, p.14		
12. Many UNC, NCCCS, and other facilities exist that could be considered as sites to provide greater access to higher education in North Carolina (both for in-person and e-learning). (see page 139 of Interim Report)	See Recommendation #1, p.37		

V. CONCLUSION

These preliminary recommendations are just that. In many instances, they suggest a further process or activity that could be started at the appropriate time. It should be noted that a significant number of these call for an increasingly collaborative approach between UNC and NCCCS. The general conclusions provide a focus for several areas in need of further study that go beyond just data-informed considerations. This further study will lead to more specific recommendations in those areas.

APPENDIX

**STAYING A STEP AHEAD: HIGHER EDUCATION
TRANSFORMING NORTH CAROLINA'S ECONOMY**
The Impact of Technology Transfer on Workforce Needs in North Carolina

Final Report
September 26, 2005

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The transfer of technology derived from university research is a major way the University of North Carolina (UNC) stimulates economic development and contributes to the workforce needs of the State. The Interim Report described the high quality graduate education and research programs of the University and the important role the University has among the major research universities in the country. This report describes recommendations to extract full economic development value from the research and innovation conducted across the University system.

The State of North Carolina and the University of North Carolina have made major strides toward capitalizing on the intellectual property generated from the state's graduate education and research programs for the economic benefit of the state. The state has made significant capital investments (\$2.5 billion in bonds) in new research and classroom facilities and enacted the Millennium Act so that multiple campuses across the state can build research facilities and encourage collaboration with industry.

Many of the UNC campuses have undertaken economic development efforts, seeking industry partners to license emerging technologies, begin start-ups, and collaborate on research and development (R&D) efforts.

While much has been accomplished, the interviews we have conducted and the self-studies University staff have undertaken show that the economic development impact via technology transfer and commercialization of research is being limited by institutional and cultural constraints.

The primary factors constraining the University's efforts at technology transfer and commercialization of research can be summarized as follows:

- North Carolina does not have an Innovation Model similar to those that exist in other states. Many states have created innovation models for emerging technologies (California Institutes for Science and Innovation, Arizona Biodesign Institute, Georgia Centers for Innovation), which build on the strengths of each state's demographics, workforce skills, and business interests. In the 1980s, North Carolina invested in a version of an innovation model when it created the North Carolina Biotechnology Center and the Microelectronics Center of North Carolina (MCNC). Both organizations have since had significant impact on economic development in our state. However, North Carolina has many strengths in other high-potential technical areas, such as in nanotechnology and high-performance computing, that would be natural candidates for a new Innovation Model concept.
- A comprehensive University direction and priority for economic development for the different economic regions of the state does not exist. Lack of state-funded support for technology transfer and economic development staff and activities, the absence of strategic industry partnerships, and the negative influences of the Umstead Act hinder and fragment the University's efforts.
- The University lacks a consistent system for faculty involvement and rewards for participating in economic development activities. The university culture needs to be such that economic development activities are rewarded and valued as a part of the tenure and promotion model.

- The structure of many University academic departments is organized by discipline and does not easily translate into market-oriented terminology used by industry interested in technology transfer and commercialization of research efforts. Industry leaders often find it difficult and confusing when attempting to learn more about the intellectual property, facilities, and capabilities embedded in the University's research programs.
- The state and the University have been criticized for business practices that create bottlenecks and slow down technology transfer and commercialization of research. The University also lacks a comprehensive information system that makes available the intellectual property of all campuses to each campus technology transfer office.

For the University to strengthen further its capacity to stimulate the state's economy and build its workforce, a greater congruence of public policy initiatives and strategic direction needs to be achieved. The recommendations proposed in this report identify changes in public policy that will strengthen the role the state and the University play in economic development through technology transfer and the commercialization of research. The recommendations are in the form of one strategic direction and four strategic goals, with each strategic goal divided into a set of objectives. Where beneficial, successful programs instituted in NC regions, select universities, or in other states are provided as a reference.

The recommended strategic direction for technology transfer and commercialization of research for the University of North Carolina is the following:

Strategic Direction: Apply the University's intellectual assets¹, created through its education and research programs, to stimulate economic development within all geographic regions of the state of North Carolina.

The four strategic goals recommended to achieve the strategic objective are the following:

Strategic Goal 1: Strengthen links to North Carolina-based industry and local area governments.

Strategic Goal 2: Orient University resources to accomplish economic development strategic goals.

Strategic Goal 3: Create incentives to stimulate research and development activity in North Carolina.

Strategic Goal 4: Invest in emerging companies and technologies.

Each of the strategic goals and their related objectives are described in the following section.

Strategic Goal 1: Strengthen links to North Carolina-based industry and local area governments.

Objective 1.1: Establish as a primary mission objective that each UNC campus address the needs of its local economic development region.

- Conduct regional cluster analyses to assess local area resources and needs [reference: Research Triangle Regional Partnership and RTI study]
- Expand graduate-degree programs where needed and recruit faculty with academic interests that address the needs of local geographic region [reference: NCSU, NC A&T approach]
- Actively seek industry partnership relationships to undertake collaborative projects such as joint research and development efforts, faculty consulting, adjunct professorships, advisory board roles, and student internship placement [see Objective 2.2 for specific steps]

¹ In this context, the term 'intellectual assets' describes all creative works or innovations that can be protected via patents, copyrights, and/or unique trademarks; as well as unique skills and capabilities that have commercial value.

- Participate in regional industry/government networks and consortia to strengthen local community ties and build relationships. Example networks include intellectual property and economic development conferences, chambers of commerce, economic development consortia, industry and trade associations, and entrepreneur organizations and networks.

Objective 1.2: Take advantage of the opportunities provided by the Millennium Campus Act to lead the collaboration and innovation effort with industry.

- Adapt the features of the Millennium Campus initiative to the specific interests and needs of each UNC campus and its regional economic development requirements.
- Use the Millennium Campus initiative to create critical mass for economic development, technology transfer, and workforce training programs.
- Build research facilities and research and development programs that stimulate university and industry collaboration.
- Create opportunities for faculty and student collaboration with industry partners.
- Provide space and support services for start-up companies.

Objective 1.3: Build and market to industry unique research facilities and test equipment.

- Build Web-based University economic development portal for use in promoting University intellectual assets and unique facilities to industry.
- When needed, establish unique regional testing facilities for high-cost, sophisticated equipment and other research facilities that would not be economically feasible for individual companies.
- Charge market rates.

Strategic Goal 2: Orient University resources to accomplish economic development strategic goals.

Objective 2.1: Streamline and coordinate University technology transfer policies and administrative processes across all campuses.

- Develop proactive, market-oriented, University-wide Technology Transfer program [reference: *Policy Recommendations for Linking University Technology Transfer and Economic Development in North Carolina: A Survey of Best Practices in the U.S. UNC Economic Development Forum, February 15, 2005*]
- Provide specific, line item state funding for the management of intellectual property, technology transfer, and economic development program activity:
 - Staffing and program support
 - Facilities and equipment
 - Information management systems
- In accordance with line item funding, link a portion of University technology transfer goals to regional and state economic development objectives.
- Create a performance-based metric system that measures commercialization impact of University intellectual property on economic development

Objective 2.2: Increase access to University intellectual property and resources (faculty, students, research).

- Create market-oriented university research clusters to better communicate research programs. *[reference: examples of research clusters created by NCA&T are the following:*
 - *Public Health*
 - *Biotechnology, Bio & Food Sciences*
 - *Advanced Materials & Nanotechnology*
 - *Computational Science & Engineering*
 - *Leadership & Community Development*
 - *Information Sciences & Technology*
 - *Transportation & Logistics*
 - *Energy & Environment]*
- Align colleges, schools, and departments to each market-oriented cluster; identify faculty leads for each cluster; and tie graduate-degree programs to a specific research cluster.
- Facilitate industry access to the University's intellectual property portfolio through economic development portal, proactive marketing programs, and realignment of research and intellectual assets into market-oriented clusters.
- Link the intellectual property portfolios of the UNC institutions and market to local industry.
- Develop marketing support and outreach programs for each research cluster, linking University resources to the interests of specific industries within each UNC campus economic development region *[reference: NCSU, Wake County Precision Marketing Initiative recruiting in the sectors of medical devices and non-woven textiles because of the NCSU strengths]*

Objective 2.3: Reduce state barriers to collaboration with industry.

- Amend Umstead Act to reduce threat imposed by criminal-based penalties and enable increased use of University facilities and equipment by industry. *(Note: accomplished in recent legislation SL2005-0397 signed by governor on 9/14/2005, which reduces criminal-based penalties to peer-review conflict-of-interest panel)*
- Review state contracting regulations with intent to streamline business practices and provide greater decision-making authority for universities.
- Modify Public Records Act to include research exemptions and deliberate exemptions for universities as done in other states

Strategic Goal 3: Create incentives to stimulate research and development activity in North Carolina.

Objective 3.1: Create an 'innovation model,' identifying and investing in one or more specific research areas.

- Examine other state innovation models and adapt to North Carolina interests. Other state examples:
 - *California (California Institutes for Science and Innovation; <http://www.ucop.edu/california-institutes/links.htm>)*
 - *Arizona (Biodesign Institute; <http://www.biodesign.org/>)*
 - *Georgia (Centers for Innovation; <http://www.georgiainnovation.org/>)*
 - *New York: NYSTAR (<http://www.nystar.state.ny.us/>)*
- Build on areas of proven UNC research and development strength in such areas as nanotechnology and high-performance computing.
- Emphasize interdisciplinary focus, involving multiple campuses and economic development regions.
- Emphasize a strong component of local industry and community collaboration.

Objective 3.2: Establish a state matching research grant program to encourage faculty collaboration with industry.

- Consider modeling program after University of California Discovery Grants program (<http://uc-industry.berkeley.edu/about/benefits.htm>) or Collaborative Funding Grants program at North Carolina Biotechnology Center (<http://www.ncbiotech.org/>). Replicate as funding opportunities in other technology fields.
- Benefits for UNC researchers and students: training for students and post-docs, special focus on interdisciplinary and multi-investigator projects, increased funding for faculty research interests.
- Benefits to State of North Carolina: accelerates commercialization of intellectual property; increases investment in NC-based research; increases competitiveness of NC businesses.
- Benefits to sponsors: access to UNC intellectual property and NC and federal tax credits; expansion of company R&D capacity; intellectual property rights

Objective 3.3: Stimulate faculty creative and innovation interests.

- Establish a state-funded, University-wide, competitive faculty small-grants, awards program for research and creative projects.
- Institute a University-wide Innovators Award program to recognize creative faculty.
- For faculty performance evaluations (promotion, tenure, merit), recognize and reward economic development activities, outside consulting, and other creative activities.
- Recognize, support, and reward faculty interested in pursuing Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), and Broad Agency Announcement (BAA) efforts. [reference: *Policy Recommendations for Linking University Technology Transfer and Economic Development in North Carolina: A Survey of Best Practices in the U.S. UNC Economic Development Forum, February 15, 2005*]

Strategic Goal 4: Invest in emerging companies and technologies.

Objective 4.1: Invest in Technology Commercialization.

- Allow UNC to budget for and use state funds to invest in advancing the stage of development of innovative technologies:
 - Develop early-stage technology through the build-out of ‘pre-beta test’ models
 - Use the results of early-stage development to facilitate licensing as well as attracting outside equity capital
- Allow UNC to budget for and use state funds to invest in independent commercialization studies: [reference *Massachusetts Technology Transfer Center – Technology Investigation and Assessment Awards—see extract from 2003 Economic Stimulus Bill here: <http://www.mattcenter.org/about/extract.htm>*]
 - Conduct independent commercialization studies to obtain authoritative assessments of market potential of University technologies.
 - Use as a base for marketing licenses or attracting outside equity capital.
 - Designate and market UNC resources with the expertise to undertake independent commercialization studies.[reference: *Policy Recommendations for Linking University Technology Transfer and Economic Development in North Carolina: A Survey of Best Practices in the U.S. UNC Economic Development Forum, February 15, 2005*]

Objective 4.2: Develop statewide Incubation Center strategy.

- Develop strategies for university-based incubators for each economic development region in the state:
 - Rural to mid-sized areas – University-based and subsidized with state-appropriated funds, if necessary
 - Urban areas – Work with private developers to develop university-affiliated, technology incubator space.
- Support growth of the newly formed statewide Incubator Alliance to share knowledge and resources and coordinate business development activities.

Objective: 4.3: Create state supported seed funding mechanism.

- Identify state fund sources for venture capital fund investments for North Carolina-based companies. Example is the state treasurer's proposal to use \$115 million of the Escheat fund that could be used to invest in venture capital funds for North Carolina-based companies

Objective: 4.4: Create incentives to stimulate and encourage "private sector pull" of technologies from the University.

- Incentives to encourage entrepreneurs: Examples include matching grants for SBIR/STTR awards (*recently passed in General Assembly*) and streamlining of terms, conditions, and time frames required to license technologies out of universities. (*see Objective 2.1*)
- Incentives to encourage small high-technology businesses: Examples include reducing costs to start and run companies and incentives for capital growth.
- Incentives to encourage investment in new technology companies: Consider increasing cap on tax credit for qualified business ventures related to investment in NC-based start-up companies.