

# UNC Tomorrow: NC State Response

## Executive Summary

Nearly 10,000 North Carolinians communicated to the UNC Tomorrow Commission about the challenges they face in regard to K-12 and higher education, community and economic development, and their concerns about health and the environment. More than 1,300 NC State faculty, students, and staff listened and recommended our campus response.

As a land-grant research university, NC State plays a unique role within the North Carolina system of public higher education.

- We provide leadership for the state in engineering, STEM education, agriculture, design, veterinary medicine, natural resources, management of technology, and textiles based on an exceptional foundation in the basic sciences, humanities, and social sciences. Our ability to interweave these disciplines and address issues from multiple perspectives gives us a strategic advantage in finding solutions to complex problems.
- NC State is UNC's unparalleled leader in the delivery of extension and outreach programs. Our responsibility extends statewide. We have Cooperative Extension Service offices in all 100 counties and on the Qualla boundary of the Eastern Tribe of the Cherokee Indians. Our Industrial Extension Service is a national model, and we administer the Small Business and Technology Development Center for the state.
- Our research capability is a potent force that drives innovation and economic development locally, statewide, and nationally. Industry comes to North Carolina to tap into its education workforce, but also for easy, collaborative access to the best research minds. NC State's research culture also enriches our undergraduate and graduate teaching with leading edge ideas and directs our engagement beyond the campus.
- We have played a central role in North Carolina's economic successes for more than a century. Not surprisingly, we are ranked fifth nationally in "university patent pipeline power" and fifth in industry-sponsored research. In the last decade, our faculty have filed about 1800 invention disclosures and 1150 patent applications, and their work has spawned 60 start-up companies.
- We are team players. Currently, we share joint or 2+2 programs with 5 UNC institutions and several community colleges, and serious discussions are underway about several more programs. We are leaders in partnering with business, industry, education, government, and the non-profit sector, as illustrated by the Centennial Campus, which was named as the Top Research Science Park in the nation and which serves as a model for other universities' outreach efforts.
- We're a good investment, ranking among the best public universities in value for students. Our faculty leverage a portion of our \$431 million state appropriation to bring in an additional \$195 million in grants and contracts. The university induces \$4.2 billion in economic impact in Wake County alone.

#### **4.1 Our Global Readiness**

As one of two doctoral, research-extensive universities within the UNC, NC State's role is to discover new knowledge while infusing that knowledge into our undergraduate and graduate teaching programs.

- We will expand their opportunities to develop an international perspective and improve their leadership and communication skills through a network of out-of-classroom activities.  
*Related initiatives: Global Network, Transforming Graduate Education, Communication across the Disciplines, Every Student a Leader, Expanded Visual and Performing Arts Programs*
- We will strengthen the effectiveness of our fundamental disciplines as the underlying support for innovation and economic development.  
*Related initiatives: Science in Support of our Economy, Citizens, Nation, and World; Enhancing NC State's Comprehensive Range of Disciplines*
- We will continue to enhance the core resource of our university to accomplish all missions by recruiting, retaining, and supporting a quality faculty and staff.  
*Related initiative: Faculty and Staff Professional and Leadership Development*

#### **4.2 Our Citizens and their Future: Access to Higher Education**

NC State is the largest university in the UNC system, and we serve a very large number of non-traditional students and students from underrepresented groups. As one of two research universities in the UNC system, NC State also has a special responsibility for graduate education.

- We will expand access to engineering and our wide range of unique offerings through interinstitutional collaboration.  
*Related initiative: Increasing access through Interinstitutional Collaboration*
- We will continue to use and invent best practices to make education affordable.  
*Related initiatives: Access and Affordability of Undergraduate Education, Access and Affordability of Graduate Education*
- Our plan to respond to the needs of the growing Hispanic/Latino population in North Carolina starts with pre-college programs.  
*Related initiative: The NC State Hispanic Initiative*

#### **4.3 Our Children and Their Future: Improving Public Education**

By mission and history, NC State is a national leader in STEM education. Our College of Education is the largest producer of mathematics and science teachers in the UNC system.

- Based on the successful Cooperative Extension Service model, we will launch an Education Extension Service to reach out at the county level to both teachers and students.  
*Related initiative: Education Extension Service*
- We propose to increase the number of initial-license teachers in STEM disciplines by 50%.  
*Related initiative: Expanding STEM Teacher Education*

- We will expand our programs of direct support to STEM teachers.  
*Related initiatives: William and Ida Friday Institute for Educational Innovation, Supporting K-12 STEM Teachers, Center for Excellence in STEM Education*

#### **4.4 Our Communities and Economic Transformation**

True to its land-grant roots, NC State forges links between activities in the academy and economic progress in our region, state, nation, and world. According to many economists, the most important determinant of U.S. economic growth is progress in science and technology—fields in which NC State has unique strengths.

- We will strengthen our faculty, our facilities, and our research base in engineering so that we can regain our status as a premier College of Engineering and a driver of economic and community development in North Carolina.  
*Related initiative: Building a Premier College of Engineering*
- We will expand the Industrial Extension Service, which leverages an annual state investment of \$3.7 million to \$207 million in improved productivity in 600 manufacturers and non-manufacturing entities in North Carolina each year.  
*Related initiative: Expanding the Industrial Extension Service*
- We will expand our successful entrepreneurship programs throughout campus and with other universities and the private sector.  
*Related initiative: Entrepreneurship, Industry Clusters, and Economic Development*

#### **4.5 Our Health**

NC State contributes high-impact research and education that advance human health. Modern medical advances have occurred at the interfaces of the biological sciences with the physical, mathematical, computational, and engineering sciences. Furthermore, human health is inextricably linked with animal and plant health: approximately 70 percent of new human diseases in the last 30 years have been "zoonoses" (diseases that spread from animals to people).

- We will expand our contributions to medical research and practice in fields such as biomechanics, biomedical imaging, tissue engineering, bioinformatics, and medical textiles, and expand programs based on healthy minds and bodies.  
*Related initiatives: Science and Technology to Advance Human Health, Global Health Initiatives, Behavioral Health Institute*
- We will investigate the science and applications that will further the security, safety, nutritional value, and production of foodstuffs in North Carolina.  
*Related initiative: Sustainable and Healthy Food Supply*
- We will expand our extension programs in health, well-being, and safety to improve access to health information and to promote health and wellness across the state.  
*Related initiative: Health, Well-being, and Safety Programs for North Carolinians*

#### **4.6 Our Environment**

To provide for both a sustainable economy and environment, North Carolina must improve management of its agricultural, forestry, freshwater, urban, estuarine, coastal, and marine

systems. Within the UNC system, only NC State has the combined expertise to address those issues holistically and comprehensively.

- At NC State, we believe that finding effective solutions to the increasingly complex issues of environmental resources and energy will require an interdisciplinary approach.

*Related initiative: Energy and Environment: Research and Extension*

- NC State recognizes that environmental responsibility begins at home.

*Related initiative: Sustainable Campus*

- We will develop solutions to challenges North Carolinians face in the built environment and improve coordination across our many programs related to the environment.

*Related initiatives: Healthy Built Environment, Academy for the Environment*

#### **4.7 Our University's Outreach and Engagement**

NC State's historical mission and statewide responsibilities makes it UNC's unparalleled leader in the delivery of extension and outreach programs. We were one of a handful of universities in the country recognized by the Carnegie Foundation for both curriculum and outreach.

- We will build on the structure of the successful North Carolina Gateway Counties Project to partner with the county offices of Cooperative Extension in launching new program initiatives that establish, connect, and bolster outreach programs from every college.

*Related initiatives: Universitywide Extension and Engagement*

- NC State will also expand on the work of the Institute for Emerging Issues to address policy issues dealing with energy and the environment, security, and STEM education.

*Related initiatives: Institute for Science and Technology-Engaged Public Policy, Expanding the Institute for Emerging Issues*

#### **5.7 Encouraging and facilitating inter-institutional and interdisciplinary collaboration**

We offer two suggestions to encourage multi-campus programming and recommend a core strategy for promoting interdisciplinary collaboration at NC State: pursuing excellence in a comprehensive range of academic disciplines.

#### **Resources**

The following summary provides best available cost estimates and funding sources for each of the initiatives included in our Response. Adjustments will be required as specific plans are developed. Cost projections represent the sum of a five-year implementation period during which many of the initiatives would be phased in. Although capital costs have been excluded, some non-recurring costs for equipment purchase and facility renovation have been included. The total cost of all proposals is \$256 million. Fifty-five percent (\$141 million) would be financed by NC State through allocation or reallocation of its own funds, grants and contracts, gifts, receipts, or other sources; forty-five percent (\$115 million) is requested from the expansion budget over five years (i.e., an average of \$23 million per year). Twenty-three percent is non-recurring.

### Resource spreadsheet

	Costs (\$ million)			Funding sources (%)					
	Section total costs	One-time costs	New recurring costs	New state appropriation	Campus (re)allocation	Grants & contracts	Gifts	Receipts	Other
<b>Global Readiness</b>	<b>66.055</b>								
Science in Support of our Economy		5.000	40.000	70	10	10	10		
Transforming Graduate Education			0.880	30	30	35	5		
Global Network		1.000	1.250		35	25	25	15	
Communication across Disciplines			2.800		55	35	10		
Every Student a Leader			1.750		40	20	40		
Comprehensive Range of Disciplines			11.000		45	45	10		
Expanded Visual and Performing Arts			2.000		85	5	5	5	
Faculty and Staff Development		0.075	0.300		80	15		5	
<b>Access to Higher Education</b>	<b>36.300</b>								
Interinstitutional Collaboration		0.400	1.200	100					
Access/Affordability for Undergraduates		0.500	3.800	40	20		5		35
Access/Affordability for Graduate Ed		1.000	29.000	35	25	35	5		
NC State Hispanic initiative			0.400		70	20	10		
<b>Improving Public Education</b>	<b>12.800</b>								
Education Extension Service			3.000	80		20			
Expanding STEM Teacher Education		0.500	3.000	80	20				
Friday Institute for Educational Innovation			1.000	100					
Supporting K-12 STEM Teachers			3.300	70		15	15		
Center for Excellence in STEM Teaching			2.000	40	10	50			
<b>Community and Economic Transformation</b>	<b>32.500</b>								
Building a Premier College of Engineering			25.000	100					
Industrial Extension Service			3.500	15		25		60	
Entrepreneurship/Economic Development			4.000	75		15			10
<b>Our Health</b>	<b>55.100</b>								
Science, Technology for Human Health		3.000	13.000	50	20	20	10		
Global Health Initiatives		5.000	13.000	30	20	40	10		
Sustainable and Healthy Food Supply		12.400	5.100	80	10	10			
Health, Well-being, and Safety Programs		0.700	1.500	60	10	30			
Behavioral Health Institute			1.400	55	15	30			
<b>Our Environment</b>	<b>41.250</b>								
Energy and Environment		19.000	6.000	60	20	10	10		
Sustainable Campus			0.500		100				
Healthy Built Environment		10.000	4.500	50	20	15	15		
Academy for the Environment		0.250	1.000		75	15	10		
<b>Outreach and Engagement</b>	<b>12.000</b>								
Universitywide Extension and Engagement			8.000	40	20	25	5		10
InSTEPP			3.000	40	20	25	15		
Institute for Emerging Issues			1.000	100					
<b>Total</b>	<b>256.005</b>	<b>58.825</b>	<b>197.180</b>						