Our Mission *[same as existing mission statement]*

Virginia Polytechnic Institute and State University (Virginia Tech) is a public land-grant university serving the Commonwealth of Virginia, the nation, and the world community. The discovery and dissemination of new knowledge are central to its mission. Through its focus on teaching and learning, research and discovery, and outreach and engagement, the university creates, conveys, and applies knowledge to expand personal growth and opportunity, advance social and community development, foster economic competitiveness, and improve the quality of life.

Our Vision

Virginia Tech will be known for tackling societal challenges; integrating teaching, research, and outreach efforts; and emphasizing quality, innovation, and results. We will develop distinctive programs that are recognized and ranked among the best in the world. We will attract and retain outstanding students, faculty, and staff from diverse backgrounds. We will increasingly focus on research that is geared toward practical applications.

Our Core Values *[same as in strategic plan 2006-2011]*

Freedom of inquiry. Fundamental to the creation and transmission of knowledge is a commitment to nurture and protect freedom of inquiry. Intellectual freedom is the foundation of academic excellence and is vital to sustaining environments in which sound and rigorous learning, discovery, and engagement occur.

Mutual respect. At the center of the educational enterprise is the commitment to the exchange of ideas and information. Respect for varied points of view and the diverse backgrounds upon which they may be based is essential to the continued growth and advancement of all members of the university community.

Lifelong learning. A commitment to lifelong learning and inquiry within and outside the university community guarantees continued growth and secures for society the benefits of ever advancing knowledge.

A commitment to diverse and inclusive communities. In carrying out its mission, Virginia Tech values the educational benefits of diverse ideas, peoples, and cultures. Articulated in the Virginia Tech Principles of Community, adopted by the board of visitors in 2005, diversity enlivens the exchange of ideas, broadens scholarship, and contributes to just engagement in all the world's communities.

Ut Prosim (That I May Serve) is Virginia Tech's motto. This attribute distinguishes Virginia Tech from all but a few of the nation's institutions. As a community of scholars and reflective of our land-grant mission, Virginia Tech is committed to service to individuals and society in all its forms.

Personal and institutional integrity. Integrity demands that all members of the university community and the university itself engage in continual civil discourse and ethical behaviors that advance learning, discovery, and engagement, supported by the administration. Integrity demands maintaining standards of personal and professional behavior of the highest order.

A culture of continuous improvement. Through benchmarking, assessment, evaluation of academic and administrative goals, and a commitment to process improvement, streamlining and change, Virginia Tech will achieve greater national and international prominence.

Introduction

This plan recognizes that Virginia Tech must address a rapidly approaching new horizon: one that will be defined by fiscal challenges and a broad range of complex problems. Addressing these issues will require us to build on our strengths; expand our mission to meet 'grand challenges'; meet our commitment to state and federal priorities in research and higher education; and ensure that we provide the best possible environment for the life of the mind.

The future will be characterized by a phase of geopolitical and geo-economic transition and by the continued globalization of industry, finance, and culture. Our graduates will face critical issues and uncertainties, security challenges, and complex systems of economic and environmental interdependence. After graduation, students will enter labor markets that are changing rapidly as a result of globalization and the structural shifts associated with changing technologies. Meanwhile, we have already entered an era of data-driven, networked societies. The changing workforce and technology needs of a global economy are changing the nature of practice in many occupations, demanding far broader competencies than simply the mastery of single disciplines.

Preparing students for this new horizon requires pedagogical models that spark curiosity, facilitate creative thinking, and develop the tools for effective communication. These models must be rigorous but not constraining, involving 'hands-on' as well as 'minds-on' approaches to problem-solving and critical reasoning.

The new horizon for research and scholarship will challenge us to build on our strengths while developing collaborative initiatives within and beyond the university. Such initiatives will enhance the opportunities for our colleges and research institutes to pursue innovative research agendas that address complex problems and allow us to be responsive to new 'game-changing' discoveries and technologies.

Fulfilling our mission in an increasingly complex and interdependent world will also require engagement initiatives that create networks spanning local, state, national and international scales. We must contribute not only to agricultural, industrial and

community development. We must also promote local, regional and national security, resilience, health, and sustainability.

These are no small challenges, especially in the context of reduced state support for higher education. With this plan, Virginia Tech is positioning itself to develop a distinctive profile as a progressive and internationally recognized public research university. To realize this objective, we must be selective about our growth in undergraduate enrollment while pursuing significant and strategic growth in graduate enrollment. Focusing on growth in graduate enrollment in science, technology, engineering, computational sciences, health sciences, and business- and policy-oriented subjects will provide funding for additional teaching resources, sustain and expand our research portfolio, and provide a broad range of student research experiences. This growth will also facilitate the pursuit of our mission to address science, technology and economic development issues of state, national, and global significance.

We will continue to invest in a comprehensive educational portfolio in which the arts, humanities, and social sciences have an essential role in kindling curiosity and creativity, growing intellectual capacities, expanding civic and intercultural understanding, and encouraging a commitment to personal and social responsibility. The integration of the arts into the fabric of our science and engineering programs offers a unique opportunity for us to develop distinctive strengths across programs.   The emergence of our architecture and design programs as among the best in the world also provide a model for the power of transdisciplinary synergy.

Achieving these goals will require the sustained fulfillment of the Commonwealth's base budget adequacy funding model, the continued growth of externally funded research and private support, and the implementation of innovative financial and business practices. It will also require a significant degree of flexibility and innovation on the part of the university in terms of existing university resources and infrastructure. The plan for 2012-2018 is guided by four structuring challenges that impact the entire university. Next are strategies to address those challenges that focus on enhancing research and innovation, fostering the life of the mind of our students, faculty, and staff, and positioning Virginia Tech as a 'destination campus' with a dynamic and distinctive learning community.

Structuring Challenges
Responding to the implications of global interdependence
Comprehensive internationalization is becoming an imperative for higher education, given the pace of globalization and the free flow of people and ideas across geographical borders. To attract international students, research partners and resources we must continue to focus on raising the university's profile worldwide by continuing to emphasize quality. It is no longer sufficient to be concerned with how the university compares with other U.S. institutions; we must shift our focus to the international arena and evaluate how our programs compare with the best programs around the world. We

must invest resources systematically over time to elevate programs that can be competitive globally.

As borders dissolve among disciplines and businesses become increasingly international, students must acquire the skills and competencies (language, history, geography, etc.) necessary to function effectively in a truly global marketplace. Students must have the opportunity for international engagement and experiences such as study abroad as a component of their educational experience. We must pursue the local-global connections that join our resident international students with domestic students and create a diverse intercultural campus environment. Virginia Tech will also strive to develop a learning community built on the principles of inclusive excellence that shape our overall diversity-related activities.

Our goal is to have more of our programs recognized as being among the top-ranked globally. To accomplish this, we must continue to recruit excellent faculty; be highly selective in choosing foreign universities and organizations for partnerships; and enter into international competitions to test our strengths and competitiveness in a global context.

Responding to the needs and challenges of a data-driven society
We live in a data-driven, networked society. Economic, technological, and social progress depend on the development of an analytically-savvy, multi-disciplinary workforce. The questions that can be asked and the methods that can be used to solve complex problems are being fundamentally altered by technology and the information sciences. Meanwhile, research and advanced graduate studies will require an increased capacity for data-intensive high-performance computing.

Our goal is to craft a university curriculum that ensures competency in data analysis and computation as a component of general education and to develop an appropriate infrastructure for e-learning and high-performance computing.

Contributing to Security, Resilience, Health and Sustainability
In the spirit of the university's mission, we will contribute to business-, industry-, and policy-relevant research with a focus on security, resilience, health, and sustainability. These themes will also underpin a great deal of outreach activity and service learning.

Virginia Tech will contribute to national and local security through research programs in cyber-security, food security, and the security of communication systems (wireless, networks, smart grids, etc.) essential to future infrastructure needs. We will also build on our leadership in the field of resiliency, with an emphasis on the interface between science, technology, and policy. Resilience is construed here as the ability of an entity (organization, organism, or system) to prepare and plan for, absorb, recover from or more successfully adapt to actual or potential adverse events. Research on resilience involves a broad spectrum of disciplines. Physicists and engineers study the resilience of complex systems; ecologists investigate the nuances of system stability and resilience of

ecosystems; while social scientists from organizational theorists to urban planners view resiliency as a key element in understanding and planning for stability in communities of all sizes. Our new capacity for research in the National Capital Region provides significant added strength to our security and resiliency efforts.

Our increased capacity in health sciences**,** with the establishment of the Virginia Tech Carilion Research Institute and the affiliated School of Medicine, represents a significant opportunity to contribute to our mission. In addition to an overall focus on health, the study of the brain and cognitive and behavioral sciences provide multiple high impact opportunities for cross-disciplinary discovery, application and implementation. From a strategic perspective, an emphasis throughout the university on studying aspects of the mind and the brain offers an opportunity to engage faculty from multiple colleges and institutes and provides an additional way to incorporate the arts and social sciences into a distinctive element of our academic profile. Studying the complex interactions between genomic, environmental, and behavioral factors will require methods that are grounded in high-performance computing and networks capable of processing and storing enormous volumes of data. Virginia Tech's strengths in computational science and high performance computing provide us with a unique opportunity to be leaders in this area of health-related research.

Security, resilience and health, in turn, connect to the theme of sustainability. Our emphasis will be on the interplay among these critical concepts in the areas of energy, materials, and technology; water quality and scarcity; transportation and communication infrastructures; international development; ecosystems and environmental quality; food and food systems; and environmental policy. An increased capacity for data-intensive high performance computing – including geographic information systems, visualization, and policy informatics – is crucial to facilitating advanced research in these areas.

Our goal is to establish a distinctive and globally-recognized profile of research and scholarship by building on our existing strengths (for example in bioinformatics, nanotechnology, neuroscience, polymers, transportation, and robotics) and by investing in our emerging strengths in security, resilience, health and sustainability.

Ensuring Quality, Innovation, and Results
 As the university prepares to move forward into the next decade, we will continue to meet demands for increased productivity and efficiency without sacrificing quality. We must also manage increasing costs and the pressures caused by our resource constraints. Our brand promise, 'quality, innovation, and results,' underscores the need to review our current business practices for opportunities to optimize efficiency, flexibility, and accountability without sacrificing our ability to remain innovative and competitive. Potential items for exploration include a thorough review of administrative policies and procedures, the administrative leadership structure, resource allocation strategies, and governance procedures.

Another strategy to cope with this changing environment involves an exploration of how to diversify our sources of revenue. Virginia Tech will actively evaluate opportunities and, where appropriate, pursue the creation of new subsidiary units, both non-profit and for-profit entities. Some will be integrated into the existing organizational structure and some will not. These new subsidiary units will have administrative and financial structures that will be responsive to a rapidly changing external environment. One example is the new company, VT IT Assets, which holds all of our fiber optic assets and frequency spectra. Some of these corporations will be linked to Virginia Tech by affiliation agreements; their purpose will be to channel resources back to support core functions of the university.

A final strategy to explore is a 'year-round' academic calendar. To be successful, a year-round operation must be aimed at enhancing academic opportunities, improving facility usage, reducing pressure on overburdened courses by offering more sections in the summer terms, and providing students with a viable option to reduce the time to graduation. Once fully studied, this initiative could help the university be both more productive and more efficient.

Our goal is to continuously review our business and operational practices to ensure we are efficient, flexible, and accountable without compromising our ability to remain innovative and competitive.

Research and Innovation

We must treat the dizzying pace of contemporary change not as a problem, but as an opportunity. We must continue to leverage the creativity and innovation that has always marked our best efforts and contributed the most to our reputation. This requires a focused effort on creating seamless networks where individuals and ideas can meet to spark creativity, collaboration, and innovation.

The Networked University

Virginia Tech students and faculty operate in a world where boundaries are becoming increasingly permeable. The world is undergoing significant economic and demographic shifts. In an increasingly interconnected – and therefore interdependent – world, students and faculty members must become increasingly international in orientation. The growing data-centric, collaborative nature of research as well as the growing emphasis on data-sharing at the national and supra-national levels will favor institutions that provide students and faculty with early exposure to the practices that are becoming essential to generating new knowledge.

The university's future research investments must therefore be facilitated, in large part, through the development of strategies to leverage networked collaborations: internally, as well as with the commercial sector, national laboratories, international partners, government agencies, and other universities. We must reduce administrative barriers to relationships with these entities, whether they are local, national, or international.

Building networks and pursuing collaborative opportunities will provide a firm foundation to continue to pursue excellence in research and scholarship. These efforts will create more research opportunities for faculty and students, improve Ph.D. student recruitment, increase Ph.D. production, and enhance our curricular breadth and teaching quality.

Pathways to Interdisciplinary Success

Virginia Tech will create and support environments for its educational and research programs that support innovative, high quality, and high-impact outcomes. We need to provide appropriate infrastructure, administrative support, opportunities for collaboration, and the time and freedom to create, apply, and communicate new knowledge. The best way to accomplish these goals is to recruit and support outstanding faculty with strong disciplinary expertise and openness to innovation. By enabling intra- and interdisciplinary teams to work without unnecessary barriers, we can achieve superior results. Strong academic departments in close partnerships with research institutes, centers, and other internal and external partners should continue to provide the intellectual and operational framework to achieve our aspirational goals.

Translational Research

Virginia Tech values research and scholarship that is innovative, collaborative, internationally recognized, and relevant. In pursuit of our mission, we will emphasize business-, industry-, and policy-relevant research. Much of this research will deal with various dimensions of national and local security; the resiliency of systems, organizations, communities, and ecosystems; the evolving health and medical enterprise; and local, regional, and global sustainability. An important hallmark of such research is that it is strongly translational in nature. Translational research is geared toward practical applications. The term has a long history in medical science and pharmaceutical research, but a translational approach also informs a great deal of research in engineering and the policy sciences and an increasing amount of research in biological, behavioral, and social sciences. Adopting a translational focus to research and scholarship builds upon and reinforces the long-standing approach embedded in our mission.

Principal Strategies
- Increase graduate enrollment toward a target of an additional 1,000 students, mostly at the doctoral level, mostly in STEM-H disciplines, and mostly on the central Blacksburg campus.
- Increase the number of post-doctoral positions in STEM-H research areas.
- Create new academic organizational frameworks – 'faculties' – initially in health sciences and in computational/information sciences. These faculties will promote research and graduate education, foster innovative and synergistic interactions among Virginia Tech faculty, assist in setting long-term strategic priorities, and build partnerships with external collaborators in which teams of researchers can compete more effectively for significant levels of external funding.

- Create meaningful partnerships with industry and governments to address critical and complex problems by co-locating researchers and practitioners in 'living labs,' user-centric, collaborative systems of research and innovation where users, in partnership with researchers, drive problem formulation and research design. As part of these efforts, we will apply best practices in the effective management of intellectual property in order to facilitate partnerships.
- As an example of a strategic global investment, develop the Virginia Tech India Campus with research programs on energy and critical technologies, informatics, infrastructure, policy and planning.

The Life of the Mind

Inspiring Creativity, Curiosity, and Critical Thinking

The Virginia Tech experience seeks to instill the value that learning drives intellectual development, discovery, and engagement. By creating learning environments, programs, and innovative curricula that broaden and deepen students' knowledge, Virginia Tech will help students grow and increase their capacity for reasoning and analysis, rational and aesthetic judgment, and oral and written communication, and their capacity to identify problems and contribute to their resolution.

Research – broadly conceived to include discovery-based and creative activities – can be a hallmark experience for every Virginia Tech student. As an experiential learning activity that synthesizes knowledge and skills acquired in the classroom, research provides a unique opportunity for students to contribute to knowledge creation. All students can benefit from research experiences such as the collection and analysis of data or connecting a basic research question to the solution of an applied problem. At Virginia Tech, students will analyze, interpret, and synthesize information from a variety of sources; practice holistic reasoning; improve verbal, visual, and written communications skills; contribute to team efforts; gain global perspective; and enhance self-confidence and preparation for a career and/or post-baccalaureate education. These goals are consistent with proposals to develop theme-based strategies for each academic year involving self-awareness, service, mentoring, and leadership. They also align well with the learning aspirations established by the Division of Student Affairs.

A commitment to research and experiential learning for students requires that we incorporate a diverse and inclusive range of perspectives and resources into undergraduate and graduate courses across all disciplines. We will respect multiple ways of knowing and multiple ways of experiencing phenomena under study. The inclusive excellence framework of the current Diversity Strategic Plan provides a solid foundation upon which we can take action, track progress, and assess results.

We must expand our ability to attract high quality graduate students by continuing to offer strong and progressive graduate programs that are appropriately supported. This objective also requires us to focus on the quality of the graduate experience beyond

disciplinary curricular offerings, including the cultivation of a culture of interdisciplinary collaboration and professional development. We must continue to address the intellectual and social environment for our graduate students through a process of continual improvement of graduate stipends, housing, faculty-student relations, mentoring, and leadership opportunities.

A New Vision for Undergraduate Liberal Education

Each undergraduate should benefit from an undergraduate education that allows the pursuit of at least one area of study in sufficient depth so that the student meets the intellectual and professional expectations of a discipline. Majors are presumed to meet this requirement. Every major program should also be responsive to university-wide expectations for integrating diversity, global and international experiences, undergraduate research opportunities, and/or experiential and service learning. Every major should also have clearly defined learning outcomes that demonstrate how critical reasoning, analysis, communication, and other skills are achieved. All of this must be built on a foundation of superior academic advising for all students. In addition, students are expected to learn some aspects of other disciplines as part of a broader general education, and to demonstrate competence in fundamental areas such as writing, computation skills, critical thinking, and communication.

How to accomplish these overall goals has been challenging for most universities. General education programs based on student selections from a smorgasbord of options across many areas of study are frustrating for students and institutions and rarely achieve desired outcomes. We must open ourselves to consider radical changes that will meet these goals, strengthen the depth and quality of student experiences, and enable academic programs to sustain core strengths in established and emerging areas of study.

To this end Virginia Tech will pursue strategies that will eradicate the need for a separate general education curriculum, without adding to the time needed to earn a degree. The current Curriculum for Liberal Education will be phased out and replaced by alternate pathways to a general education. These will include (but will not be limited to) the provision for certain combinations of majors and minors, or of double majors to meet university requirements for a general education. Thus, for example, students in science, engineering, or professional majors may select a second major or a minor in the humanities, social sciences, or the arts. Students in the humanities, social sciences, or the arts majors could select any second major or minor program, provided the discipline has a sufficiently different emphasis. In addition, every student would then take fundamental courses in English/communications and computational science/mathematics.

E-Learning

Technological changes and paradigms for learning are moving forward at a remarkable pace. Most major universities in the United States deploy e-learning as part of their degree offerings. Virginia Tech currently offers over 400 online courses. Ninety percent of the students enrolled take at least one online course as a part of their on-ground

educational program. E-learning courses (both synchronous and asynchronous) leverage technology, communication tools, and teaching-learning processes that many students now embrace and expect in their educational experiences.

Virginia Tech must continue to focus on the quality of the learning experience. Faculty and student development, ongoing assessment, and financial viability are key issues in our continued success in e-learning initiatives. Future development of e-learning courses must embrace sound pedagogy through a combination of active and engaged learning with appropriately matched technology tools. We must ensure that faculty have the skills needed to leverage technology to provide meaningful student-to-student interaction, student-to-faculty interaction, active learning, and timely and constructive feedback. Some of these tools are in their infancy, but they can provide a new level of substance and power to the e-learning model we currently employ. Hybrid courses, that leverage both the e-learning and on-ground components of a course, will allow for additional courses to be delivered within our existing infrastructure.

Integrating our e-learning and computational sciences initiatives can be a central component to learning and inquiry for Virginia Tech students. We can incorporate analytical tools into courses to allow for both students and faculty access to advancement of computational sciences skills necessary to implement data-intensive inquiry. The impact can be dramatic.

Principal Strategies
- Increase undergraduate involvement in meaningful research experiences and experiential learning opportunities by adopting a 'hands-on, minds-on' philosophy that promotes connecting real-life experience with academic concepts.
- Increase support for international experiences and foreign language competency for undergraduate and graduate students.
- Develop ways to integrate computational sciences and skills for managing and analyzing complex data sets across a wide range of disciplines.
- Replace the current Curriculum for a Liberal Education with alternate pathways to general educational competencies.
- Increase the range of synchronous and asynchronous courses that leverage technological and analytical tools.
- Identify opportunities during construction and renovation to create flexible classroom spaces that fully support e-learning components.
- Increase the quality and availability of academic advising from orientation through graduation.

Becoming a 'destination campus': The Virginia Tech Experience

Ut Prosim, That I May Serve, is the essence of the Virginia Tech experience, the guiding principle of our community. It rests upon a bedrock of trust, integrity, tolerance, and compassion. We cannot serve without honoring diversity. We cannot be a vibrant community without promoting inclusiveness, respecting individuality, and valuing the unique contributions of each of our members.

These values are generally embraced within academia. But to become a 'destination campus' for the very best students, post-doctoral scholars, and faculty, Virginia Tech must continue to implement programs and policies that create the superior research, learning, and workplace environments essential to a vibrant academic institution. We must continue to expand efforts to foster diversity and inclusion. We must explore and expand programs that promote and enhance well-being, cultural awareness, and intellectual development. Recognizing the competitiveness of the labor market, we must also continue to expand and improve policies that promote a healthy work-life balance and ensure that we have inspiring learning and workplace environments. We strive to be known as a destination for scholars and students to live, work, and study in dynamic and inclusive spaces.

Virginia Tech will also actively pursue strategies that welcome military veterans to our campus. The Veterans Administration has reported that more than 250,000 veterans are currently pursuing higher education degrees on the GI Bill. Virginia Tech seeks to become known as a preeminently veteran-friendly university in the United States by developing programs and providing the services necessary for veterans to successfully transition from the military to the classroom. Virginia Tech remains similarly committed to sustaining its success and prominence in intercollegiate athletics while ensuring that student athletes succeed in the classroom and graduate in a timely manner.

As a 'destination campus' we must also work toward a sustainable setting by developing a campus-wide willingness and commitment to critically evaluate our practices and embrace new technologies and innovative solutions. This commitment must include extensive engagement and collaboration among students, faculty, staff, and administrators. The Virginia Tech Climate Action Commitment and Sustainability Plan, adopted in 2009, will continue to serve as our touchstone as we continue to refine and identify policies and practices that promote the most efficient and responsible use of University resources.

Principal Strategies
- Pursue quality-of-life initiatives in support of university vibrant, dynamic, and sustainable workplace, physical, and cultural environments.
- Expand efforts to recruit military veterans and invest in programs that facilitate veterans' transition to campus life and provide the necessary foundation for academic success.

- Implement the Climate Action Commitment and Sustainability Plan and ensure ongoing evaluation and critical examination of the University's policies and practices toward ensuring the most efficient and sustainable use of our resources.