Part II:

A. Institutional Mission:
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.

B. Strategies

208 Program Strategies:

1. **Advance Faculty Salary Competitiveness to the 60th Percentile:** Virginia Tech is regularly ranked among the best institutions in the world. We owe this success to our outstanding faculty who are committed to excellence in education, research, and outreach. We know that the highest quality employees in our organization are constantly being sought out by peer institutions, industry, and research centers around the world. Attracting and retaining the caliber of faculty needed to maintain and improve upon our successes is becoming increasingly difficult. While compensation is only one factor that contributes to the university’s ability to attract and retain the best faculty, it is a major consideration. In addition, the replacement of faculty is far more expensive than the cost to retain those persons for whom the university has already invested significant time and resources. Competition for faculty across top-tier institutions is accelerating, creating an environment in which faculty are rewarded for mobility in addition to performance. The university’s authorized faculty salary currently ranks at the 32nd percentile of the SCHEV peer group for Virginia Tech: 18th of 26 institutions in terms of salary competitiveness. Maintaining an annual merit process that rewards our top faculty for their efforts is fundamental to keeping up with the market and mitigating turnover. In the absence of a statewide compensation process, the university will make limited progress with nongeneral fund revenue alone.

2. **Increase Staff Salaries:** Much like faculty, the slow pace of growth of staff compensation has negatively impacted retention and recruitment efforts at the university. The need to competitively compensate the hard-working support staff at the university is a key factor in ensuring a highly productive and innovative organization.

3. **Address Operation and Maintenance of New Facilities:** With new facilities coming on-line during the planning period, including the university’s new Classroom Building, operation and maintenance support is a primary cost driver in the future budget. Facilities must be open year-round in order for the university to deliver its mission of providing programming for the citizens of the Commonwealth. Addressing operation and
maintenance of facilities will ensure the maximum facility service life and the prevention of building deficiencies.

4. **Advance Strategic Research Opportunities and Enhance Entrepreneurial and Innovation Ecosystem:** Virginia Tech is the Commonwealth’s largest research institution resulting in more than half a billion dollars of research in Virginia annually ($513 million in 2014). We have grown over the last ten years to become the 38th largest research program in the United States and are advancing transdisciplinary knowledge in areas such as neuroscience, water, energy, cybersecurity, autonomous systems, resiliency and nanoscience. With the continued support of the Commonwealth, we will work to increase our research expenditures supporting discovery and economic development for the state. State support is critical for developing the necessary infrastructure to compete for and secure external funding for research that leads to discovery and economic development opportunities across the Commonwealth.

5. **Increase Access for Virginia Undergraduate Residents:** The university has grown enrollment of resident undergraduates by over 2,400 students since 2004. Despite this growth, demand continues to outpace the university’s ability to provide access to highly qualified Virginia students. A record of almost 22,500 students applied to be in the university’s fall 2015 class. Demand is broad-based and impacts every college on campus. New and growing STEM-H degree offerings such as neuroscience and computational modeling and data analytics provide an opportunity to leverage the university’s expertise to provide students with high-demand skills and knowledge to be successful in the economy of the future. By partnering with the Commonwealth, the university can expand resident undergraduate enrollment to qualified students from all corners of the Commonwealth and ensure a high-quality education for our residents.

6. **Expand and Enhance STEM-H Degree Production, Health Sciences, Neuroscience, Creative Technologies, and Computational Thinking:** Virginia Tech is the state’s STEM-H leader and produces nearly 25% of the Commonwealth’s STEM-H graduates. We have developed innovative interdisciplinary undergraduate degree programs in neuroscience, nanoscience, systems biology computational modeling and data analytics and other areas that directly support the growing research and economic base of the Commonwealth and the nation.

In particular, the neuroscience bachelor’s degree program has proven to be an area of high interest and demand for new entering students. The university has undertaken a multi-year plan to leverage the Roanoke-based research expansion in this area to build a high enrollment on-campus undergraduate program and faculty in neuroscience. Additionally, Virginia Tech offers the only nanoscience undergraduate degree in the Commonwealth and is one of only two in the United States. This multi-disciplinary degree program exposes students to geosciences, physics, chemistry, and biology and prepares them for a career in this growing field of discovery and development.
Cutting edge undergraduate degrees in microbiology, systems biology, and water will provide skills needed in the areas of energy and global sustainability. Further, the university has modified its general education requirements to include courses in “computational thinking” to help all students attain a sophisticated fluent knowledge of the implications and possibilities of the digital age, as the university also seeks to offer more experiential learning opportunities through the support of undergraduate research opportunities that will lead to better job preparation and advance career opportunities for graduates in STEM-H fields.

7. **Support Faculty Startup Packages, Particularly for New Faculty in the STEM-H Fields, Including Equipment and Lab Renovation:** Establishing and setting up a research facility or lab for a newly hired faculty member can cost millions of dollars, but is a necessary cost as advanced facilities and equipment are essential for faculty to successfully compete for research funding from the federal government and other private sources. The university must be able to provide start-up packages to faculty to support equipment and infrastructure purchases that position them to successfully operate their instructional and research responsibilities. Once in operation, externally sponsored research can supplant startup costs through returned overhead, and startup funding can be transitioned to support new incoming faculty.

8. **Expand K-12 Pipeline Opportunities for Underserved Virginia Residents to Access a Virginia Tech Education:** Virginia Tech, the commonwealth’s premier STEM-H institution, is committed to supporting the Statewide Strategic Plan for Higher Education. In order to increase access and affordability for all Virginian’s, while also optimizing student success for work and life, the university will expand upon existing, successful outreach programs to provide a comprehensive K-12 Pipeline program that offers educational opportunities to more students than ever before. The newly developed targeted K-12 Pipeline initiative is a two pronged approach that will 1) enhance outreach to underserved Virginians while students are in the K-12 system and 2) expand student financial aid to increase access to Virginia Tech.

9. **Ensure Access for Low and Middle-Income Families by Continuing to Expand Need-based Financial Aid to Undergraduate Students:** Virginia Tech in its land grand mission is very sensitive to student access to higher education, including student cost and borrowing levels. The university’s Funds for the Future financial aid program protects returning students with financial need from tuition rate increases. This and other need-based financial aid programs are intended to work in concert with increases in state support for student financial aid. Additional state funding for student financial aid can help address financial access for low- and middle-income students and continue to ensure Virginians at all socio-economic levels can access a Virginia Tech education.

10. **Support Timely Degree Completion Through Enhanced Student Advising, Year-Round Academic Programs, and Instructional Resource Sharing Opportunities:**
The Joint Legislative Audit and Review Committee found that Virginia Tech has one of the highest graduation rates in the state and has successfully reduced the average time to degree from 4.22 to 4.11 years since 2007. Continuing this trend can expand the university’s ability to enroll Virginia students and reduce the time and expense of completing a degree program.

Good student advising services are essential to helping students properly plan and execute an efficient course of study leading to their desired credential. Departments and colleges are adopting a model that relies more heavily upon professional advisors for students in order to provide continuity over an undergraduate student’s career. Professional advising staff can assist students in this more technical process and allow faculty advising to focus on academic mentoring and career planning.

To continue to accelerate degree completion, incentives must be expanded to increase on-campus instruction and facility use over the summer and winter months. The university is working to implement strategies to increase the utilization of year-round instruction at the Blacksburg campus by: (1) Lowering the costs for students who take seat based courses in Blacksburg over the summer/winter sessions, (2) creating a summer/winter undergraduate research programs to provide meaningful, resume building employment for students, (3) expanding course offerings to meet the needs of students seeking to advance their plans of study toward early degree completion (4) increasing available student financial aid to ensure access to summer/winter enrollment, and (5) creating summer bridge programs for entering freshmen.

The university also plans to continue expanding efforts to share instructional resources, where appropriate, to ensure that students can access needed courses. These efforts include the Commonwealth Graduate Engineering Program, foreign language courses and biological science online resources through the 4-VA consortium, a shared graduate certificate in translational medicine with the VT-Carilion School of Medicine, research and dissemination of pedagogical best practices for distance learning within the 4-VA consortium, among others. These efforts assist students and the Commonwealth by enhancing student success while ensuring timely degree completion.

11. **Increase Graduate Enrollment in Strategic Areas:** The university will increase graduate student enrollment, focusing on masters and doctoral level science, technology, engineering, mathematics, and health sciences (STEM-H). Graduate education is a key component of the university research mission that leads to innovation, technological development and entrepreneurship vital for the continued success of the Virginia economy. The Commonwealth’s investment would be leveraged with growth in external grants and contracts to support a vibrant comprehensive system of graduate education programs in STEM-H disciplines and cross-disciplinary programs.
12. **Increase Number of Full-Time Faculty:** The institution is stressed in its ability to provide an excellent instructional opportunity for its students. This has mandated larger class sizes, the use of adjuncts, graduate students, and professional instructors in the delivery of curriculum and has limited the availability of key course sections for students. Continued growth in high demand areas such as engineering, architecture, business, and life sciences has strained student to faculty ratios and limited the university's ability to expand high-demand offerings. Financial support to hire additional full-time tenure track and instructional faculty will allow the university to maintain the high quality instructional opportunities demanded by its students while ensuring access to courses that are desperately needed for timely graduation.

13. **Library Enhancement:** Addressing the rising costs of journals and other library materials is central to maintaining and enhancing the value of the university’s library collection to both students and researchers. Additional investment is needed to continue providing access to information on cutting edge research in a variety of subject areas to students and faculty while minimizing the negative impacts of increasing costs of subscription based resources and information platforms. Expanding research programs of the institution also require access to new books, journals and other databases not in the current collection.

14. **Increase Support for Unique Military Activities:** As one of the nation's senior military colleges, the Corps of Cadets at Virginia Tech is producing the next generation of Virginia’s leaders. The university seeks increased support for the Unique Military Activities program that is equivalent to per student support at other public military programs within the Commonwealth.

15. **Advance Institutional Efficiencies and Effectiveness to Support Cost Containment Efforts:** Improvement of the university's processes and infrastructure requires investments in cost containment efforts that will reduce expenses, address capacity needs, and modernize instructional and other university facilities. These investments will allow the university to address issues such as student health, safety, environmental sustainability, and at the same time answer to the changing regulatory environment, all while managing future capacity and costs.

16. **Reallocation of Existing Resources to Support University Priorities:** In an environment of cost containment and limited capacity for revenue generation, the university plans to continue to reallocate existing resources to support university strategic priorities including academic advancements, support for faculty startup packages, and enhancing the competitiveness of faculty compensation.
17. **Utility and Fixed Cost Increases.** Rising costs of contracts, utility service, and other mandated or required operating costs must be addressed to maintain the delivery of institutional services.

18. **Fringe/Health Increases.** Increases in fringe benefit rates and health insurance expenses will impact the university’s expense budget.

19. **VRS Increases.** While the Commonwealth will reach the ninetieth percentile of actuarial rates for the Virginia Retirement System employer contribution in FY16 (one year earlier than projected), the university continues to plan for inflationary increases in its program costs.

C. **Financial Aid:** Virginia Tech’s student financial aid programs are designed to help support student access, enrollment, retention and graduation goals. Virginia Tech provides access to low and middle income students with demonstrated financial need through multiple funding sources including the use of unfunded scholarships, as prescribed in §23-31 of the Code of Virginia, and as required by the university’s management agreement.

A key innovation in meeting this need at Virginia Tech is the Funds for the Future program, which ensures a predictable tuition rate for returning students through grants to help mitigate the impact of tuition increases. These grants are awarded based on family income and financial need. Starting with the incoming class of 2005, the university has protected continuing students with financial need from tuition and fee increases with the Funds for the Future program. The program provides varying levels of tuition increase protection for families with adjusted gross incomes up to $99,999, capturing both low and middle-income students with need. Additionally, the Virginia Tech Safety Net Grant supports in-state Pell Grant recipients. A separate program, Virginia Tech Grant, supports the university’s land grant mission by assisting students with the greatest financial need. The university also supports other, smaller programs that assist financially needy undergraduate low and middle income students.

- The university has recently expanded its support for financial aid for low and middle income families through the Funds for the Future program. Beginning in the fall of 2015, any family with an adjusted gross income of less than $50,000 will be 100% protected from increases in tuition and mandatory fees during their undergraduate career at Virginia Tech.

The university continues to allocate institutional resources to maintain the purchasing power of student financial aid programs and mitigate the impact of tuition increases on student borrowing. The university’s graduates continue to track lower than their national peers in the percentage who take out student loans and their average debt at graduation. In 2013, 55 percent of Virginia Tech graduates borrowed an average of $26,925 each, as compared to the national average of 69 percent and $28,400, respectively.
D. Evaluation of Previous Six Year Plan:

As the Commonwealth of Virginia continues to recover from significant budget challenges, opportunities to invest and grow areas of the university’s operations have been limited. Addressing fixed cost increases and nongeneral fund assessments related to compensation, fringe benefits, and health and retirement costs, coupled with the cost of prior enrollment growth before state funding was provided for enrollment growth, have limited the progress that the university has made. Limited General Fund investment in the 2012-14 biennium, coupled with a significant general fund reduction in 2014-16, has required the university to reallocate existing resources in order to make modest progress towards the goals in the university’s Six-Year plan. In spite of funding challenges, the institution has made significant accomplishments including:

- In fall 2014, Virginia Tech set enrollment records with 3,839 Virginia freshmen, 17,656 Virginia undergraduates, and a total headcount of 31,224; all exceeding former thresholds.
- Continued expansion of institutional student financial aid programs to support low- and middle-income families.
- Health/Life science research has advanced rapidly at the university, including growth of the Virginia Tech Carilion Research Institute. The expansion of the medical research program, along with a growing core of highly-skilled researchers and a current portfolio of $45 million in externally sponsored research, continues to play a key role in the revitalization of the Roanoke and Southwest Virginia economy. Virginia Tech has a cooperative relationship with the Virginia Tech Carilion School of Medicine established in 2010. The School of Medicine received full accreditation and graduated its first class of physicians in 2014.
- The Virginia Tech Carilion Research Institute is pushing the boundaries of traditional academic disciplines with transdisciplinary academic programs, such as the Translational Biology, Medicine, and Health doctoral degree program while also developing intercollegiate research opportunities.
- Efforts to enhance degree completion and academic opportunities that encourage year-round utilization of facilities include discounted summer tuition, expanded summer undergraduate research opportunities, and the university’s Summer Academy transitional program for first-year students and incoming transfer students have resulted in the largest ever summer enrollment in Summer 2014, reaching a high of 9,535 students. In 2013-14, the university also implemented its first ever Winter Session, offering additional degree credit opportunities for students. The Winter Session generated 3,682 student credit hours in the first year (1,055 unique students) and grew by 70% to reach 6,250 student credit hours in the second year it was offered (1,767 unique students).
- The university reallocated existing resources to make minimal progress towards addressing compensation to retain and reward hard-working faculty and staff. This investment allowed the university to maintain its standing at the 32nd percentile of
peer average salaries (ranking 18th of 26 institutions). Continued progress towards the Commonwealth’s goal of the 60th percentile will require considerable and consistent focus on competitive compensation in the coming biennia.

E. Capital Outlay Significantly Impacting E&G and NGF costs:
Virginia Tech continues to grow in undergraduate students, particularly in STEM-H majors. Over the past decade STEM-H majors have grown by 2,600, or 31 percent. Thus, as the total number of students is expanding, the number of STEM-H majors is growing at a faster rate. Most of this growth will be in engineering, traditional sciences, as well as in new degree programs such as neuroscience. Meanwhile, during this period of expansion, the university last constructed an undergraduate laboratory facility in 2004 for instruction in chemistry and physics. The university’s existing inventory of science laboratory instruction is now too small and generally outdated to accommodate the current demand for instruction spaces by engineering and science majors. The Undergraduate Science Laboratory project would construct a new undergraduate science laboratory facility of 102,000 gross square feet to accommodate the growing demand for STEM-H degrees at Virginia Tech.

The undergraduate engineering program is ranked 6th nationally among public universities. Holden Hall, which currently houses Material Science Engineering and Mining/Mineral Engineering was constructed in 1940. Holden Hall has had no major renovations or building improvements since it went into service and totals about 42,100 gross square feet. The building is located in the heart of the academic enterprise and within the engineering precinct of campus. The Holden Hall Renewal project seeks to renovate a 21,000 gross square foot portion of Holden Hall. The remaining 21,100 gross square feet will be demolished and replaced with approximately 81,000 gross square feet of engineering instruction and research space for a total new building size of 101,000 gross square feet, yet utilize the same footprint as the existing structure. The new and renovated space will provide modern laboratories and classrooms sufficient to support the growth and activities of all three departments, including the return of the computer science program to main campus; a critical need for the College of Engineering to serve students. Without improved and expanded space for these departments, the university cannot meet the expectations of students and faculty for an engineering education from Virginia Tech.

The Central Chiller Plan, Phase II project is included as a top priority to continue the strategic infrastructure advancements initiated by the Chiller Plant, Phase I project (Chapter 1/874, project code 208-17657). The Phase II project request includes the upgrade of campus utility systems and addresses four key strategic needs for shifting the campus to lower resource consuming cooling service: (1) replace outdated, inefficient existing non-centralized chilled water capacity on campus; (2) update and add machines and equipment in existing central plant facilities to maximize the existing plant footprint and optimize refrigerant use; (3) install the necessary thermal distribution networks to accommodate campus growth and retirement of the non-centralized facilities throughout the campus to include installation of a 20,000 ton per hour above ground chilled water storage system connected to the district cooling loop; and (4) provide distribution to future development in
the Northwest Community district. The primary scope of this project includes replacement and upgrade of central plant equipment in the existing campus chiller plants and the expansion of the underground distribution infrastructure to link campus chiller substations and bring existing campus buildings on-line.

The existing Virginia Tech-Carilion Research Institute (VTCRI) facility in Roanoke provides laboratory space for up to a maximum of 30 research teams and the building is now completely full. The VTCRI Biosciences Research Addition project is a high priority request to construct a four story, 45,500 gross square foot addition for translational biomedical research and education to continue the Institute’s medical discovery and economic contribution to the region and state. The addition will support another 15 research teams focused solving problems of the brain, heart disorders, and cancer. The facility is envisioned as a 45,500 gross square foot addition to the existing Virginia Tech-Carilion School of Medicine and Research Institute in Roanoke. The proposed project will serve as a fully operational and contained biomedical research and research education facility.

In response to demand for undergraduate degrees in neuroscience and nanoscience, the university has recently implemented new undergraduate degrees in each of these disciplines. These degrees, both of which are new and cutting edge for undergraduate populations, are proving very popular among incoming students. Based on current demand, the university anticipates enrolling up to 1,000 undergraduates in these programs by 2019. The university’s existing inventory of science laboratory space is too small and outdated to support growth in these new STEM-H fields. A new Neuroscience Research Laboratory building is needed to provide the sophisticated, state-of-the-art classroom and research laboratory space that is required by the technologies used in expanding research science fields. This project will complement the general assignment laboratories in the university’s other undergraduate science laboratory project requested in this capital plan. An 80,000 gross square foot science laboratory building is envisioned with a program that includes dense high performance wet laboratory spaces, neuroimaging laboratories, nanoscale imaging laboratories, and nanoscale characterization laboratories, supported by high-intensity computational facilities.

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<th>Agency 208</th>
<th>General Fund</th>
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<td>5 Neuroscience Research Laboratory</td>
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Virginia Tech is sensitive to the total cost of education passed on to our students. We understand that resources are finite, and projects that impact the cost of attendance to our students undergo significant scrutiny and planning to ensure that students’ value meets or exceeds the impact of any incremental costs. A project that may occur in the upcoming Six-Year Planning period envisions new student facilities to support enrollment growth; including but not limited to residential, dining, recreation, and student unions. Planning for these activities will be coordinated with actual growth and spending plans, while also balanced with the needs and impact on student costs. The university seeks to phase in projects over a multi-year planning period in an effort to control costs and minimize any potential impact on student fees.

F. Restructuring:
In the ten years since the General Assembly passed the Restructured Higher Education Financial and Administrative Operations Act of 2005 Virginia Tech has experienced significant benefits through the ability to locally manage university processes and resources. Particularly in a period of constrained resources and growing fixed costs, the flexibility provided through Restructuring has allowed the university to continue to make progress in important strategic areas, and has become the standard operating environment at Virginia Tech. From the ability to manage capital outlay decisions on a more timely basis to streamlined purchasing and reporting requirements, the benefits of the state’s forward-thinking in the Restructuring Act permeate the operating culture of the university and facilitates decision-making at the ground level where the university can deploy efficient and specialized solutions to meet our management needs.

This is not a uniquely Virginia Tech issue but rather a shared vision for higher education operations across the commonwealth. To that end, the university supports a thorough conversation that includes our Level III colleagues to illuminate the possible advancements to restructuring.

Initial opportunities for additional flexibility and cost savings could include, but are not limited to, advancements in the following domains:

- The ability to develop and enact long-term plans.
- Assured continuity of operations
- Procurement flexibility
- Flexibility in the management of human resource programs.
- Assured retention of nongeneral funds and savings by institutions.
- Expanded management authority regarding enrollment management, including enrollment mix, to strengthen revenues without significant tuition rate increases while assuring the delivery of a high quality education to an increasing number of Virginia students.
- Additional flexibility in leasing, information technology management, capital budgeting.
- Reduced administrative requirements.
- Streamlined access to state programs (e.g. VCBA)
Moving forward, Virginia Tech strongly supports the maintenance of existing financial and administrative autonomy granted in the Restructuring Act, as well an exploration of potential future areas where the state and institutions can partner to advance higher education. The university operates in a competitive and complex environment, and the flexibility to approach issues with institutional authority results in faster and more effective solutions. A future meeting with our partner institutions and state leaders to discuss the current state and future of Restructuring would be appreciated. Our hope is that this discussion would lead potential enhancements that benefit the Commonwealth as a whole and provide our institutions with the optimal ability to compete globally.