Virginia Department of Planning and Budget

Project Request Justification

2006-2008 **Biennium** **Date:** **July 22, 2005**

A. General Information

1. **Agency name:** Virginia Tech — **2. Agency code:** **208**
3. **Project title:** Construct Institute for Critical Technology and Applied Science, phase II — **4. Agency priority:** **6**
5. **Contact Person:** M. Dwight Shelton, Jr.
6. **Contact's telephone number:** (540) 231-8775
7. **Contact's e-mail address:** mdsjr@vt.edu

B. Proposed Project

1. Project Cost:

General Fund/General Fund supported debt	**17,500,000**
Nongeneral fund	
9 (c) revenue debt	
NGF supported 9 (d) revenue bonds	**17,500,000**
Total request	**35,000,000**

2. Project cost changes:

NONE.

3. Description:

- The Critical Technologies Research Laboratory Building proposal is for a state-of-the-art research facility with highly specialized research laboratories that will support both applied and fundamental research in several multidisciplinary areas including biomedical engineering, bioengineering, biomaterials, bio-nanotechnology, communications technology, and sensor technology. These programs are instrumental in the University's progress toward a premier position in life sciences research.

- The program for this scientific research laboratory building calls for 77,000 gross square feet of research space to support approximately 27 research faculty, 9 support personnel, and 128 doctoral and post doctoral students. The building is envisioned to be located on-campus and adjacent to the existing life sciences buildings including Bioinformatics, Biology Laboratory, Vivarium, Veterinary Medicine, and Animal Sciences.

- To ensure the building is highly productive for many years into the future, the design of the building will include flexible spaces to accommodate updates for changes in technology and shifts in research discovery. Some of the design features to ensure this adaptability to the future include the following elements:

    - Easily modified space, and laboratory and equipment layouts
    - Open laboratory space that can be adjusted as projects grow or decline
    - Laboratories that minimize physical barriers such as walls or fixed support spaces
    - Sufficient laboratory services to support multiple disciplinary applications

- The funding plan for this $35 million research laboratory facility calls for $17.5 million of General Fund support and $17.5 million of nongeneral fund support. The nongeneral fund component is requested as a revenue bond authorization. The bond authorization is needed because permanent funding will be provided by resources that are planned to arrive over a longer period than the project schedule.

- The innovative section of the financing plan is for a portion of the revenue bond debt service to be repaid with indirect cost recoveries. With up-front bond financing to cover the $17.5 million nongeneral fund component of the financing plan, the debt service costs may be repaid over time from the indirect cost recoveries generated by research grants and contracts conducted within the building and from private gifts.

4. Project scope change:

NONE.

5. a. Approved Master Site Plan: **Yes** [X] **No** [ ]
If not, explain:

b. 2004-10 Capital Outlay Plan: **Yes** [X] **No** [ ]
If not, explain:

6. Equipment for a previously funded project.

NONE.

7. Supplement to a previously funded project.

NONE.

C. Project Justification

1. a. Existing condition:

- The University's inventory of laboratory space to support this type of research is not sufficient or technically capable to meet current research instrumentation performance

requirements. To achieve the envisioned output potential of the ICTAS program, total building space needs are estimated at 285,000 gross square feet (GSF), phased over three buildings. One ICTAS facility with approximately 100,000 GSF is underway as part of the 2002 GOB program, with an estimated completion date in early 2008.

- The ICTAS program needs approximately 185,000 additional gross square feet of state-of-the-art research laboratory space to reach its potential. This request is for the second building (77,000 gross square feet) with a total cost of $35 million, which the university proposes to share with the state on a 50-50 basis.

- As an example of the quantity and quality of existing space, the College of Engineering currently occupies about 506,000 assignable square feet (ASF) that includes 307,000 assignable square feet (ASF) of research space. This space is spread over eight main buildings and multiple smaller spaces adjacent to campus or off campus. Of the 307,000 ASF of research space, only 86,000 ASF is modern (being built between 1990 and 1997). The remainder of the research space is between 32 years old and 77 years old. While this older space continues to support less intensive functions, it is not suitable for the pursuit of state-of-the-art research work. None of the existing engineering and life sciences space has the systems or structural capacity necessary to house the new research technologies for imaging and measurement, such as nuclear magnetic resonance facilities, that are required to conduct research at the micron scale.

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b. Facility Condition Index: **FCI** _____

c. Space deficit: **Yes** [X] **No** [ ]

2. Programmatic information:

- Virginia Tech has established the goal of becoming a leading research university as a top priority. The university has developed several long-term strategies to achieve this top tier vision including the Institute for Critical Technology and Applied Sciences (ICTAS). This capital project request represents the second step to fulfilling the space needs for this innovative, multi-disciplinary research enterprise. The first step is underway, with the research laboratory building funded in the 2002 General Obligation Bond program. This request is for the second building.

- The core premise of the ICTAS plan is to capitalize on existing strengths of the university while using collaborative, interdisciplinary models to foster cutting-edge areas of research where the life sciences and engineering technologies overlap. This building will house the Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences. This new facility is critical to the future success of the overall research program and to fulfilling the expectations of faculty and graduate students for high-quality, low vibration, wet- and dry-lab space, which are not currently available.

- The university is investing significant resources into this program as one of its top priority initiatives to grow research productivity. Without this proposed building, the ICTAS program can not reach its potential and will stall. Further, this project is envisioned to significantly

enhance and increase high-quality research space that is also necessary to support local business and industry and to support economic development throughout the Commonwealth.

3. Alignment to strategic plan:

This project will support Virginia Tech's strategic plan in the areas of Research and Scholarship, Graduate Education, Undergraduate Education, and Outreach. The Institute for Critical Technology and Applied Science II building will provide modern laboratory facilities to support interdisciplinary research activities in life sciences and engineering. The availability of such facilities will enhance university research capabilities, support local industry and economic development, and advance the following goals of the university:

Research and Scholarship:
1. Increase the stature of Virginia Tech as a national research university in quality of research and scholarship.
2. Increase the stature of Virginia Tech as a national research university in quantity of research and scholarship.

Graduate Education:
1. Increase the quality of the graduate programs.

Undergraduate Education:
1. Maintain a current, relevant, and comprehensive undergraduate curriculum.
2. Strengthen the quality of undergraduate instruction.
3. Create learning experiences for undergraduate students that maximize the benefits of attending a large research university.
4. Expand the university's leadership role in the effective integration of instructional technology and pedagogy.

Outreach:
1. Sustain the university's commitment to the outreach mission.
4. Organize, coordinate, communicate about, and integrate the various economic and community development activities at Virginia Tech.

D. Options Considered

Other options considered but not selected include leasing, renovating existing space, or delaying the project entirely. Constructing a new facility is the selected option because of the significant and unique facility demands required to support the ICTAS program.

- Leasing is not a feasible option because it is not financially viable to enter into a capital lease for this particular project because of its construction requirements and its site on campus.

- Renovating an already existing facility is not a viable option because the university currently operates with a shortage of research laboratory space. Thus, no existing space is available to allocate for renovation to accommodate this expanding program. Further, the majority of research laboratory space on campus is more than 32 years old and does not include

adequate levels of essential infrastructure support and thus would be less economical to develop as opposed to new construction.

- Delaying the project to a future biennium is not a viable option because the college has a ten-year implementation plan to reach their research goal, and this building is critical to have in place by 2009 to sustain the momentum created by the addition of the first building.

  Virginia Tech is requesting funding for this project now because timing is critical given the speed at which the fields of nanotechnology, sensor development, bioengineering, biomaterials, and communications technology are evolving. The timescale at which developments in basic science are reaching the application stage has dropped from years to months in many areas of related study. As such, institutions that seek to claim a primary position in these fields must do so in the immediate future. Delaying the project will place the ICTAS at a competitive disadvantage for funding and projects because late entrants will be limited to working on ancillary applications and data corroboration and that is not compatible with the University's top tier research objective.

E. Project Schedule Changes:

NONE.