



Virginia Department of Planning and Budget  
**Project Request Justification**

2004-2006

Biennium

Date: 10/12/04

**A. General Information**

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|-----------------------------------------------|--------------------------------------------------------------|---------------------|------------|
| 1. Agency Name:                               | <u>Virginia Polytechnic Institute &amp; State University</u> | 2. Agency Code:     | <u>208</u> |
| 3. Project Title:                             | <u>Critical Technologies Research Laboratory Building</u>    | 4. Agency Priority: | <u>5</u>   |
| 5. Name of Person to Contact about this Form: | <u>M. Dwight Shelton, Jr.</u>                                |                     |            |
| 6. Contact Person's Telephone Number:         | <u>(540)-231-8775</u>                                        |                     |            |
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**B. Proposed Project**

1. Description (include project size, capacity, and purpose):

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 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 \$32.5 million research laboratory facility calls for \$16.25 million of General Fund support and \$16.25 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 \$16.25 million non-general 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.

2. In approved Master Site Plan:  
If not, explain:

Yes  No

3. In current Strategic Plan:  
If not, explain:

Yes  No

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## C. Project Justification

### 1. Programmatic:

Virginia Tech has established 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. 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 technology overlap that are growth-oriented and have the highest potential for further development, outreach, and economic impact. The engineering and life sciences research programs at Virginia Tech are among the strongest in the nation, and the merger of their disciplinary approaches will be the backbone of the ICTAS strategy. For the University to fulfill its ambitious research vision, researchers from the College of Engineering, College of Sciences, College of Veterinary Medicine, and College of Agriculture and Life Sciences will be collaborating and sharing space in this new laboratory facility to explore problems of critical importance to the world.

Without this research laboratory building, the University cannot fulfill its research production potential needed to support the Commonwealth's research objectives nor the University's initiative to become a top tier research university. The new building 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. 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.

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### 2. Existing facilities:

The University's inventory of laboratory space to support this type of research is not sufficient or technically capable to meet even current research 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 103,000 GSF is underway as part of the 2002 GOB program, with an estimated completion date of April 2007. This project provides a critical "jump start" to initiate the program.

The ICTAS program needs approximately 182,000 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 \$32.5 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 30 years old and 75 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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#### **D. Options Considered (include as an option delaying this project until future biennia)**

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 30 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 2008 to sustain the momentum created by the addition of the first building.

The 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 another year 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.

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#### **E. Project Scope Changes:**

The original project scope, as submitted in the 2004 budget request included 75,000 gross square feet. The scope has been increased to 77,000 gross square feet to accommodate stand-alone heating and cooling systems because the capacity of the central plant is not sufficient to cover this building.

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**F. Project Cost Changes:**

The original cost of the project, as submitted in the 2004 budget, was estimated at \$28 million. The cost estimate has been increased to \$32.5 million to reflect one year of added escalation in construction costs and to accommodate stand-alone heating and cooling systems.

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**G. Project Schedule Changes:**

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