



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 Sciences Research Laboratory I 4. Agency priority: 7
 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	22,000,000
Nongeneral fund	
9 (c) revenue debt	
NGF supported 9 (d) revenue bonds	22,000,000
Total request	44,000,000

2. Project cost changes:

NONE.

3. Description:

- This project has been on the university's capital plan since 2003, formerly called Life Sciences Research Facility. This project requests an authorization for a 93,300 gross square foot scientific laboratory facility to fully support interdisciplinary science research focused on Geosciences.
- The building will be a combination of offices, class laboratories, research offices and laboratories, and graduate student space that will be used to house a number of departments and programs that are growing in enrollment and extramural research funding.
- The project scope is based a thorough analysis of the geosciences program needs to accommodate the state-of-the-art laboratory requirements for 30 faculty and 90 graduate students.
- The life expectancy of the facility is 80 years with proper maintenance.

- The funding plan for this \$44 million research laboratory facility calls for \$22 million of General Fund support and \$22 million of nongeneral fund support. The nongeneral fund component is requested as a revenue bond authorization that will be repaid by overhead revenue generated from the research program and targeted fundraising that will occur in the university's current Capital Campaign.

4. Project scope change:

NONE.

5. a. Approved Master Site Plan: Yes No
If not, explain:

b. 2004-10 Capital Outlay Plan: Yes 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 is confronted with an aging inventory of science laboratory space, much of it built in the 1970's and before, that is inadequate even with significant renovation to support the new protocols and instrumentation the latest micro- and nano-scale investigations require. This new building is needed to provide the sophisticated, state-of-the-art research laboratory space that is required by the technologies utilized in expanding research science fields, such as those proposed for this facility.
- The primary occupant of the proposed facility will be the Department of Geosciences. The highly ranked programs in this department are currently housed in Derring Hall, a building never specifically designed for geoscience research and as such lacks appropriate space needed in today's demanding laboratory research environments. Examples of space that is lacking include clean rooms for mass spectrometry, vibration-free rooms with low electromagnetic backgrounds for ultra-high resolution electron microscopy, and shielded rooms for high pressure and temperature experiments. Basic support rooms, such as common areas, map rooms, and rock, mineral, and fossil storage rooms, are not available. In addition, research laboratories in Derring Hall are very difficult and unreasonably expensive to bring up to modern construction, utility, and safety standards so that state-of-the-art analytic instrumentation and laboratories can be properly housed. For example,

precise room temperature control, required by many types of analytic devices, is difficult, and in certain cases impossible.

- The new building will also specifically allow for the cross-fertilization of geosciences with related fields, especially in the life, resources, and environmental sciences. This will occur by allowing for common areas and laboratories in the new building to be shared by various disciplines, a technique now used in the United States at the most successful research universities. Related versions of this concept have already been implemented at Virginia Tech, for example, in the Fralin Biotechnology Center. The results are highly encouraging, showing an increase in the creative productivity of the resulting research, but also for critical aspects of both teaching and learning.
- In summary, this building will provide 1) additional space which is badly needed by several departments, 2) modern scientific laboratories for carrying out cutting edge experiments and observations, and 3) a mixing of sciences providing the most fertile ground for new discoveries important to Virginia Tech, the Commonwealth, and the world.

Higher Education Only

b. Facility Condition Index:

FCI _____

c. Space deficit:

Yes No

2. Programmatic information:

- A key component of the university's strategic plan is to advance the university's research program through the development of expanded basic and applied research in the physical, biological, and life sciences.
- The key program for this project is the Department of Geosciences, a department which embodies the cornerstones of the scientific arenas mentioned above, including biology, physics, and chemistry. The department is the highest ranked department in the College of Science at Virginia Tech, according to the prestigious National Research Council rankings, and has been for over 20 years. It has been ranked as high as 17th in the country, and in the top five of all public universities. It now has the potential to be a top 10 department among all universities. Virginia Tech and the Commonwealth have benefited handsomely from the success of Geosciences, from international publicity, to national and international conferences that are attracted to this area, and to the vast amount of natural resources and environmental research that is conducted by the department.
- The department is in the process of significantly increasing its numbers of faculty (from 22 to more than 30) and graduate students (from 55 to more than 90). To continue to attract the best faculty and graduate students in the world, additional space is essential. Further, for many decades, geoscience general service courses for undergraduates have been very popular, from courses dealing with the Earth through time, natural hazards, and resources. As a result, thousands of students take these classes each year, and more teaching space in a set location is needed to more effectively carry out this important mission.

- This building project is required to make substantive, quality improvements to current international class programs within the geosciences and related fields, and also to begin new programs which will accompany the department's growth. And although the Department of Geosciences represents the core occupants for this new building, the facility will serve members of other physical, biological, and resource science departments that have a natural connection to the geosciences. The synergy between geosciences and these other groups is a naturally powerful one, and this new facility will begin a generation of cooperation between all of these important disciplines.

3. Alignment to strategic plan:

This project will support Virginia Tech's strategic plan in the areas of Research and Scholarship, Graduate Education, and Undergraduate Education. The Sciences Research Laboratory I will provide modern laboratory facilities for interdisciplinary research areas, including life sciences and physical sciences. The facility will also provide much needed graduate student space for programs with increasing enrollments and research activities, and supports 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.

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 interdisciplinary research in the physical and life sciences.

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 laboratory 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, without the near term availability of modern research facilities, the university will miss the opportunity to participate in the latest interdisciplinary research in the physical and life sciences.

E. Project Schedule Changes:

NONE.