



# Project Request Justification

2008-2010

Biennium

Date: October 29, 2008

## A. General Information

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|---|--|---------------------|------------|
| 1. Agency Name:                               | <u>Virginia Tech</u>                                 | 2. Agency Code:     | <u>208</u> |
| 3. Project Title:                             | <u>Replace Deteriorated Section of Davidson Hall</u> | 4. Agency Priority: | <u>1</u>   |
| 5. Name of Person to Contact about this Form: | <u>Robert R. Broyden</u>                             |                     |            |
| 6. Contact Person's Telephone Number:         | <u>(540) 231-8782</u>                                |                     |            |
| 7. Contact Person's E-mail Address:           | <u>rbroyden@vt.edu</u>                               |                     |            |

## B. Proposed Project

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

The Davidson Hall project was a University top priority request in the 2008 budget session, and the state placed it in the tier two funding section of Chapter 1, 2008 with \$1.506 million of detail planning funds. The planning funds have been approved and allotted under project code 17662 and schematic design is underway. Under the pre-planning work effort, the University has determined with a high degree of confidence that an approximately 42,000 gross square foot (GSF) demolition and replacement project may be accomplished for a total budget of \$31.4 million including the \$1.506 million of planning funds authorized in Chapter 1. This 42,000 GSF project will meet the intent and be programmatically consistent with the original project proposal (H-1, CNJ, C1, and S1) that justified the planning funds and is described in detail on the attached updated C1 and S1 forms.

In accordance with the capital program outlined in Chapter 1, 2008, the University is requesting the balance of the project budget (net additional \$29.894 million) to fully fund the project. The current detail planning funds are sized to complete preliminary designs which are estimated to exhaust June 2009, and the estimated construction start is July 2010. The University is requesting the balance of the project funding in the 2009 session to ensure an efficient design process and avoid a year delay and cost escalation. If full project funding is delayed until the 2010 budget session, the project may experience design breakage while on-hold from June 2009 to July 2010. Further, based on the current construction market, the total project cost will escalate about 12 months, or 6 percent, beyond the current \$31.4 million budget estimate.

The location of Davidson Hall is on the core of the academic campus and is a critical instruction location for students. This project will replace the center and north sections and is the highest and best use of the land and building. The proposed project will restore the level of space needed for the program and will enable students to be optimally trained to move into today's industrial, governmental, and academic laboratories that specialize in nanotechnology, chemical biology, computational chemistry, environmental chemistry, drug discovery, and macromolecular chemistry to serve the commercial and governmental needs of the Commonwealth.

The scope of the project includes 42,020 GSF, slightly smaller than the initial 51,200 GSF scope originally envisioned, of demolition and replacement. This scope was established by a thorough analysis of the chemistry program's instructional activities as one of the University's highest volume service teaching departments. The replacement space will include 25 large size classrooms and class laboratories, faculty offices, and group work areas to support chemistry instruction. The replacement section of Davidson Hall will have an estimated structural useful life of about 50 to 80 years.

The program for the project is 100 percent educational and general instructional support for the chemistry undergraduate and graduate programs with modern instructional classrooms and laboratories. Thus, the funding plan calls for full state support. This project will not impact student fees.

2. In approved Master Site Plan: Yes  No   
If not, explain:

3. In current Strategic Plan: Yes  No   
If not, explain:

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### C. Project Justification

#### 1. Programmatic:

The chemistry program includes over 250 people including undergraduates, graduate students, postdoctoral fellows, research technicians, and faculty and delivers about 22,337 weighted-student-credit-hours annually - one of the highest volumes of service teaching in the University.

Chemistry instruction at Virginia Tech is of direct value to the Commonwealth of Virginia and a vital component of a comprehensive university. Many small and large companies that do business in Virginia have direct ties to the Chemistry Department, through short courses, the hiring of Virginia Tech chemistry graduates, intellectual property transfer, small business start up, and grants and contracts. Many recent discoveries in the areas of proton exchange membranes for hydrogen fuel cells, drug discovery, medical diagnostics, homeland security, and composites for structural applications can be traced to activities in chemistry at Virginia Tech. Graduate students were involved in each of these advances and undergraduates were involved in many of them, and the projects provided invaluable laboratory training to the students.

The proposed replacement project will mitigate two negative impacts on chemistry instruction caused by the ill suited conditions of Davidson Hall. First, the chemistry program is slowly losing space as areas of the center are shuttered, resulting in overcrowding and overuse of the New Chemistry/Physics building and Hahn Hall as critical activities are shifted in an attempt to accommodate laboratory demand. Second, the out-dated laboratory infrastructure of the building constrains the level of modern chemical activity that may be practiced, thus limiting the training potential for students.

The proposed project will restore the level of space needed for the program and will enable students to be optimally trained to move into today's industrial, governmental, and academic laboratories that specialize in nanotechnology, chemical biology, computational chemistry, environmental chemistry, drug discovery, and macromolecular chemistry. The replacement section will support the specialized instrumentation that requires high ceilings, adequately powered and environmentally conditioned space that can not be accommodated in the current infrastructure of the building.

The mission statement of Virginia Tech as a public land-grant university serving the Commonwealth of Virginia, the nation, and the world community includes discovery and dissemination of new knowledge 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.

The University's strategic plan includes three scholarship domains: Learning, Discovery, and Engagement; and three Foundational Strategies: Development of the Organization, Investment in the Campus Infrastructure, and Effective Resource Development, Allocation, and Management. This project supports several key domains and strategies of the strategic plan, and the specific goals of each area addressed by this project are listed below.

Learning:

*Increase student involvement in discovery and engagement by creating more opportunities for undergraduates to be involved in research capstone experiences, education abroad, and experiential learning.*

*Invest in departmental and university-level support for undergraduate education.*

*Enhance quality graduate and professional education.*

*Establish a graduate education portfolio reflective of a 21<sup>st</sup> century university.*

*Contribute to the holistic and transformative educational experiences of Virginia Tech undergraduate and graduate students.*

*Improve the capital assets that underpin student learning and support programs.*

Discovery:

*Strengthen research activities with a focus on energy.*

*Strengthen research activities with a focus on materials.*

*Strengthen research activities with a focus on the environment.*

*Achieve research strength in the areas of innovative technologies and complex systems through the strategic integration and support of critical research areas.*

Engagement:

*Connect the University's discovery, learning, and engagement assets through partnerships with both the public and private sectors to advance the economic vitality of the commonwealth and the quality of life of its citizens.*

*Engage students, at the undergraduate and graduate levels, in opportunities for service learning and experiential education that prepare them to serve a diverse and complex marketplace and society while building the capacity of communities.*

**Foundational Strategies:**

*Effectively manage the University's space and land resources for learning, living, and work.*

*Enhance health, safety, and security operations to support the University's discovery, learning, and engagement endeavors.*

In summary, the reconstruction of the center section of Davidson Hall is essential to the growth and health of the chemistry program at Virginia Tech. A more modern physical plant for chemical training will facilitate undergraduate, graduate, and faculty recruiting and enable the chemistry department to strengthen its programs in chemical biology, computational chemistry, nanomaterials chemistry, and macromolecular chemistry.

**2. Existing facilities:**

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 work require. This demolition and replacement project is needed to provide the sophisticated, state-of-the-art classroom and laboratory space that is required by the technologies utilized in modern science fields, such as those for chemistry.

The chemistry department operates in three buildings on campus: the New Chemistry/Physics Building is used for undergraduate classroom instruction, Hahn Hall is used for sponsored research, and Davidson Hall is used for undergraduate and graduate laboratory instruction.

Davidson Hall was constructed in 1928 with additions in 1933 and 1938, and with renovations in 1965 and 1981. The building originally housed undergraduate and graduate chemistry classrooms and laboratories. The undergraduate classrooms and a portion of the laboratories moved to the New Chemistry/Physics building in 2004. The relocation of the undergraduate program to the new building has made room to update Davidson Hall - one of the most outdated and seriously deteriorated facilities on campus.

Conditions in many areas of Davidson Hall are approaching unsafe levels due to age and incompatibility with modern scientific teaching methods. For example, the north and center sections now show rainwater leakage; missing stonework at exterior walls; inadequate climate and dust control; and outdated electrical power, water, nitrogen gas plumbing, and air handling that hamper training and challenge proper safety. The center section is so deteriorated that nearly half of the teaching laboratories have been shuttered. The building deterioration in the center section is severe and will require razing and replacement - renovation of this section is not an option. The historic front (south) section of Davidson Hall

will remain and is scheduled for complete renovation in a subsequent project as reflected in the University's Six-Year Capital Outlay Plan.

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**D. Options Considered** (include as an option delaying this project until future biennia)

Other options considered but not selected include renovating the center and north sections of the building or delaying the project entirely. Rebuilding the deteriorated sections of the building is the selected option because it is the most cost effective solution for replacing academic space in the central area of campus, which is in high demand.

Renovating the center section of the existing facility is not a viable option because constructing new space is more effective for the amount and condition of space. Further, the existing structure may not be adequately modernized because of restrictive floor to ceiling heights. Because of the intensive laboratory requirements and the existing structural limitations, the estimated premium to renovate, as compared to replacement, is about 100 percent to achieve the same program specifications. An effort to renovate the building to meet modern requirements may result in a 50 percent loss of net assignable square feet because of the ceiling height restrictions, essentially doubling the unit cost per square foot.

Delaying the project to a future biennium is not a viable option because the center section of Davidson Hall is deteriorating rapidly and the safety of the building will become questionable in the near future. General operations and maintenance reserve projects can no longer bring the facility up to acceptable conditions and the space is needed to satisfy growing demand for classroom and laboratory space on campus. Each year of delay is estimated to add about six percent to the total cost, or nearly \$2 million to delay a year.

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**E. Project Scope Changes:**

NONE.

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**F. Project Cost Changes:**

NONE.

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## **Instructions for DPB Form CNJ Project Request Justification**

**This form is to be prepared only for projects authorized for detailed budget development during the 2008-2010 biennium.**

The project request justification (DPB Form CNJ) details the project's scope and justifies its need. The need must be demonstrated from several perspectives, including the agency's programs and activities and the condition of the existing facilities, in order to show why it is important to fund your request. The narrative should be as thorough and complete as necessary. The quality of your submission is extremely important. Remember who your audience is for this submission and **do not** use technical engineering terms and jargon. Decision-makers may only have your narrative as the basis for considering the merits of your request.

**The justification for additional funding due to anticipated cost overruns on a currently approved and funded project must include the scope adjustments (i.e., reduction in scope) that would be needed to finish the project with existing funding.**

### **Section A. General Information**

- Item 1.     **Agency Name.** Enter your agency's name.
- Item 2.     **Agency Code.** Enter the three-digit agency code for your agency.
- Item 3.     **Project Title.** Give the new project a clear descriptive title.
- Item 4.     **Agency Priority.** Number from the DPB Form H-1.
- Item 5.     **Name of Person to Contact about this Form.** Enter the name of the person to contact who can answer specific questions concerning the information provided on this form.
- Item 6.     **Contact Person's Telephone Number.** Enter the telephone number of the contact person.
- Item 7.     **Contact Person's E-mail Address.** Enter the e-mail address of the contact person.

### **Section B. Proposed Project**

**Item 1. Description.** The project description should be of sufficient detail to clearly define the scope of the project. This description should address the project's size and capacity. It should also describe how the project would meet specific needs. Below is some of the information that should be presented in this section, as applicable:

- The scope of the project, including type of space proposed, the square footage, and any unique or unusual features.
- Life expectancy of the new facility.
- Methods or sources used to determine the proposed scope.

**Item 2. In approved Master Site Plan.** An explanation should be provided if not in master site plan.

**Item 3. In current Strategic Plan.** An explanation should be provided if not in the current strategic plan

## **Section C. Project justification**

**Item 1. Programmatic information.** The justification for a project is based on how it supports your agency's strategic plan. Specifically, this section should address the following:

- Description of the current use of the facility(ies).
- Description of the relevant programmatic activities, both current and projected, that would be affected by the project. Indicate any services, operations, or activities that will be initiated, expanded, or improved because of this project.
- How the project will support your agency's mission and your current and planned program goals and objectives. How does the proposed project relate to the agency's strategic plan?
- The necessity of the project in terms of objectives, services, and customers. Be sure to indicate the number and type of clients or staff who will benefit from the proposed project. Provide numerical estimates of current and future users of the facility using quantitative data such as number of positions (FTE), average prisoner days, or full-time equivalent students. Highlight any population characteristics important to the project. Indicate and discuss projection methodologies used.
- Address whether the project is required to continue current services, to handle a workload increase, or to provide for new or better quality services.
- For institutions of higher education, be sure to include a summary of the impact of student fee increases

**Item 2. Existing Facility(ies).** To determine the need for a project, you must describe your present facilities. Include in this description information on the adequacy of existing facilities to meet current and projected program demands. To support the need, provide the following information, as appropriate:

- Why the existing facility is inappropriate or inadequate, such as overcrowding or the need to accommodate new programs.
- Age and condition of current facility, analysis of man-hours and expenses invested annually in repairs, interruptions of services or backlogs of services, safety hazards to customers, and health and safety code violations. (Specify which code edition.) Indicate if the request is a result of legislative (federal or state) or judicial mandate or from standards or certification requirements. Be as specific as possible. Use quantitative measures when available and applicable to demonstrate why the capital project is needed.
- Interim accommodations being used to compensate for facility deficiencies or the lack of facilities, including currently leased space.
- Information on the future use of the existing facility(ies) that could impact upon the proposed capital project, such as any future expansion or conversion of the facility.

- How the proposed project fits into the approved Master Site Plan for your agency.

#### **Section D. Options Considered**

This section should identify and discuss any alternatives to the proposed project that were considered and the rationale for selecting the requested project. Provide the estimated cost for each of the alternatives considered. **One option that must be addressed is the impact of deferring the project until a future biennium.**

#### **Section E. Project Scope Changes**

This section should identify and explain any differences between the scope on the DPB Form C-1\_S-1 in this submission and those provided on the previously submitted DPB Form H-1.

#### **Section F. Project Cost Changes**

This section should identify and explain any differences between the cost estimates on the DPB Form C-1\_S-1 in this submission and those provided on the previously submitted DPB Form H-1.