

Capital Budget Request

Construct Translational Medicine Center

Overview

Agency	Virginia Polytechnic Institute and State University (208)
Project Code	none
Project Type	New Construction
Biennium	2016-2018
Budget Round	Initial Bill
Request Origin	Previously Submitted
Building Name	
Project Location	Roanoke Area
Facility/Campus	Blacksburg Main Campus
Source of Request	Agency Request
Building Function	Higher Education Instruction and Research -- 100% E&G
Infrastructure Element	Laboratory
Contains significant technology costs? No	
Contains significant energy costs? No	

Agency Narrative

Agency Description

Project Summary:
 A key component of the university's strategic plan is the translational approach to research and scholarship to reinforce the ethos of innovation and collaboration that are fundamental facets of our land grant mission. The university has made strides toward this goal with the implementation of the Bioinformatics program, its joint degree program in biomedical engineering and research with Wake Forest university, the creation of the Virginia Tech-Carilion Research Institute, and recent restructuring efforts designed to reorganize existing university resources in microbiology, cell biology, macromolecular sciences, and genomics to more effectively accomplish its life sciences goals.

This new facility is planned to specifically meet the needs of the university to engage in translational medicine research and clinical interventions. Biomedical research and basic research in bacteriology, immunology, and cancer require access to animal clinical settings to investigate disease and procedural innovations. The proposed translational research complex will be specially designed to explore and apply new frontiers in the biomedical sciences such as regenerative medicine. The building will be configured to support the rapid expansion of the university's research program. The development of the facility will also enable the College of Veterinary Medicine to expand its clinical oncology program where veterinary oncologists treat cancer in pets as they work side-by-side with other college researchers in the development of new cancer treatments that are beneficial for both people and animals.

This facility is a critical element in the university's capacity to continue to grow its medical and medical-related research. It will enable the faculty in several colleges and departments to successfully compete for National Institutes of Health, Homeland Security, and other sponsored research funding.

The proposed laboratory building includes 30,000 gross square feet to provide the College of Veterinary Medicine, with a single, consolidated facility to undertake translational medical research and training. The cross-disciplinary program creates a unique external funding position to capitalize on grant and contract opportunities, both public and private. For example, the National Institutes of Health awards more than \$24 billion annually and categorizes grants specifically by their emphasis on translational opportunity. The top 50 pharmaceutical companies spend more than \$88 billion annually on R&D and seek to bring basic scientific discoveries to market in effective and safe treatments through this type of translational research.

The university's existing inventory of dense, biosciences clinical training and research space is too small and outdated to sustain existing research and support growth in translational medical work.

Physical Description of the Facility:
 The proposed building will be located as an extension of the existing College of Veterinary Medicine facility's animal hospital wing, just north of the existing hospital entry and adjacent to the Infectious Disease Facility wing. The project's 30,000 gross square feet includes a 10,000 gross square foot renovation within the existing Teaching Hospital on the ground floor and 20,000 gross square feet of new construction for hospital

and high-performance laboratory space adjoining the Teaching Hospital.

The proposed laboratory building includes 30,000 gross square feet to provide the College of Veterinary Medicine, with a single, consolidated facility to undertake translational medical research and training. Research laboratories, conferencing and administrative spaces will be designed to facilitate an interdisciplinary approach to creative problem-solving in a range of scientific disciplines.

The translational research complex will be specially designed to explore and apply new frontiers in the biomedical sciences such as regenerative medicine. The building will be configured to support the rapid expansion of the university's research program. The development of the facility will also enable the College of Veterinary Medicine to expand its clinical oncology program where veterinary oncologists treat cancer in pets as they work side-by-side with other college researchers in the development of new cancer treatments that are beneficial for both people and animals. Clinical laboratories serving research will be modular units permitting expansion or consolidation to meeting changing research programs and initiatives. It is envisioned to be a three story structure, clad in a combination of Hokie stone, brick, precast concrete panels and trim, and a combination of curtain wall glazing and punched opening windows.

Justification

Program Description:

A key component of the university's strategic plan is the translational approach to research and scholarship to reinforce the ethos of innovation and collaboration that are fundamental facets of our land grant mission. The university has made strides toward this goal with the implementation of the Bioinformatics program, its joint degree program in biomedical engineering and research with Wake Forest university, the creation of the Virginia Tech Carilion Research Institute, and recent restructuring efforts designed to reorganize existing university resources in microbiology, cell biology, macromolecular sciences, and genomics to more effectively accomplish its life sciences goals.

This new facility is planned to specifically meet the needs of the university to engage in translational medicine research and clinical interventions. Biomedical research and basic research in bacteriology, immunology, and oncology require access to animal tissue and clinical settings to investigate disease in animals and to test initial drug and procedural innovations. This facility is a critical element in the university's capacity to continue to grow its medical and medical-related research. It will enable the faculty in several colleges and departments to successfully compete for National Institutes of Health, Homeland Security, and other sponsored research funding.

This rapid development of basic research into applied treatments can speed drug and treatment development to the economic benefit of the Commonwealth. Translational medicine combines the efforts of basic scientists and clinical researchers to turn laboratory discoveries and innovations into practical clinical solutions that can help both animals and humans. The translational medicine approach dissolves boundaries between basic molecular research and clinical practice to increase the rate of innovation and speed with which new and better products and services become available in the clinical arena. Examples of translational research include successful efforts to use laboratory based genetic research to rapidly develop and test vaccines for diseases that affect both humans and animals. Another example is to recognize animals as potential models for human disease such that advances in treating cancers or obesity in animals also benefit humans.

Virginia Tech has partnered with Wake Forest University's Institute for Regenerative Medicine to form a new Center for Veterinary Regenerative Medicine in which researchers from both organizations work collaboratively to develop new regenerative medicine treatments for animals and human patients. These types of programs are high priorities for NIH and other federal granting agency funding and create opportunities for new drug, therapy and device development resulting in economic development through new patents, start-up companies and licenses.

Proximity to the Virginia-Maryland Regional College of Veterinary Medicine as well as the Life Sciences Corridor of the Virginia Tech Master Plan will allow close collaboration and frequent interaction between faculty and students working in translational medicine, infectious disease and other related sciences.

The university's strategic plan references the following principle strategies:

- Emphasizing translational research and scholarship
- Maintaining growth in research expenditures toward a target of \$680M by 2018
- Creating meaningful partnerships with businesses and government entities to address complex problems by co-locating researchers and practitioners in living labs.

Existing Facilities:

The university is confronted with an aging inventory of science laboratory space, much of it built in the 1970's, 1980's, and earlier that is inadequate to support the new protocols and instrumentation that these micro- and nano-scale investigations require. This facility is needed to provide the sophisticated, state-of-the-art research laboratory space that is required by the technologies utilized in these expanding research science fields.

Existing veterinary medicine research facilities located adjacent to campus are badly deteriorated and insufficient for current research, much less expanded efforts in translational medicine. This building will be located in the existing on-campus college of veterinary medicine complex and integrate directly with the current teaching hospital, the Infectious Disease Research Facility and other buildings to be added in the life sciences corridor in the future.

The new building will be physically and functionally integrated with existing College of Veterinary Medicine animal hospital through construction of this major translational medicine and research center. The project will provide a much needed expansion of the Veterinary Teaching Hospital on the ground floor, and high-performance laboratory space on other levels to support new dimensions of achievement in scholarship and discovery.

Funding Plan:

The program for this project is 66 percent instruction and 34 percent research. The funding plan for this \$23.4 million research laboratory facility calls for \$19.4 million of general fund support and \$4 million of nongeneral fund support. The nongeneral fund component is requested as a combination of 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 capital campaign.

Options Considered:

Existing veterinary medicine research facilities located adjacent to campus are badly deteriorated and insufficient for current research, much less expanded efforts in translational medicine. Other existing life science facilities do not have capacity to support interdisciplinary research in this field. Deferral of this project to a future biennium may result in the Commonwealth not being a leader in this rapidly developing area of medical science. This project is necessary this biennium to support substantial program investments currently underway.

Alternatives Considered

Costing Methodology

The method for estimating costs includes: 1) using unit costs in the Bureau of Capital Outlay Management's Construction Costs Database updated April 2015 with a regional market multiplier and a multiplier for softs costs; and 2) comparables as shown in the CR-3. Both methods are escalated to a construction midpoint of 2019 at three percent

On a total project cost basis, inclusive of design, construction, and equipment, the unit costs are \$778 per gross square foot. The unit construction costs of the project are \$616 per gross square foot, including self-performed construction work. The building types in this request are wet laboratory, dry laboratory, and research laboratory in the Bureau of Capital Outlay Management's Construction Costs Database.

The construction costs are based on an internal analysis of program requirements and current market building comparables within the Blacksburg campus setting. Soft cost estimates developed by university staff based on historical data costing analysis and trends over the past eight years. The project is anticipated to have moderate site conditions and will use an appropriate construction delivery method for the size and complexity of the project. Project costs are estimated to the mid-point of construction using three percent escalation in accordance with the instructions for developing the Six-Year Capital Outlay Plan.

The building envelope will be comprised primarily of 'Hokie Stone' with precast concrete accents consistent with university standards as affirmed by the Board of Visitors. The Virginia Tech Board of Visitors has directed that all new building projects and expansion projects built on the Blacksburg central campus must use Hokie stone as the predominate building material on all building facades. Brick, metal panels, and siding materials are not permitted as substitutions for Hokie stone. In maintaining the random ashlar stone pattern of our collegiate Gothic buildings, the university has explored a wide range of contemporary stone erection means, methods and systems. The most efficient system tested that meets erection, insulation and moisture protection requirements utilizes a four-inch thick nominal stone thickness with a two-inch nominal air barrier over moisture resistant sheathing. Stainless steel anchoring straps and load bearing shelf angles and stainless steel flashings comprise the structural support and flashings system, meeting our requirement for a 50-100 year enclosure life expectancy. Because the university owns the stone quarry, the quarrying and stocking of all the cut stone is carried as a project (soft) cost, and the construction budget carries all erection, final stone dressing, installation and intensive quality assurance inspection costs.

Mechanical equipment and building automation systems will be designed to maximize energy efficiency and minimize operations and maintenance costs. Mechanical equipment will be located inside and screened from view to maximize student use of the campus landscape. Electrical systems will support current academic technologies and increased student use of individual technology equipment. Effective use of exterior and interior glazing will enhance energy efficiency lighting fixtures for an improved academic experience. Design priorities will include flexibility to maximize the long-term programmatic functionality of the building.

The Virginia Maryland Regional College of Veterinary Medicine is the states only veterinary college. Renovation and expansion of the teaching hospital will serve these students. As professional instructional and interdisciplinary space, these buildings must have high-capacity wireless networks to support multiple devices (laptop computer, tablet computer, smartphone) used simultaneously by students and faculty to retrieve information and to communicate within the classroom or laboratory and to connect digitally with instructional and other research sites around campus and around the world. Specialized degrees in STEM-H fields such as Veterinary Science require specialized equipment specific to those fields and sometimes shielded or vibration protected areas in which to operate this equipment. The university operates its own communications network using primarily internet connectivity which requires accessible, climate controlled server rooms in lieu of the traditional phone closet. Because the communications infrastructure is installed by our own university operated auxiliary it is carried as a project (soft) cost outside of the normal construction budget.

As the largest university in the state in terms of full-time equivalency enrollment, Virginia Tech relies on classroom technology to support effective and efficient instruction of large class sections. This requires automated audiovisual and classroom lighting controls, which also rely on wireless networks. Specialized degrees in engineering and sciences require specialized equipment specific to those fields and sometimes shielded or vibration protected areas in which to operate this equipment. The university operates its own communications network using primarily internet connectivity which requires accessible, climate controlled server rooms in lieu of the traditional phone closet. Because the communications infrastructure is installed by our own university operated auxiliary it is carried as a project (soft) cost outside of the normal construction budget.

This project will require replacement of parking spaces at the planned site. Construction Manager at Risk is the intended delivery method for this project. Project costs are estimated to the mid-point of construction using three percent escalation in accordance with the instructions for developing the Six-Year Capital Outlay Plan.

Summary of Translational Medicine Center, Phase 1 Other Costs:

1. Hokie stone used as primary exterior building envelope material.
2. Building foundation deep caissons or piers to remediate unsound subsurface foundation conditions
3. Raised flooring systems throughout laboratories and support spaces for flexible use of electronic equipment
4. Specialized building slabs designed to eliminate ground vibration interfering with sensitive scientific equipment

Agency Funding Request

Phase	Year	Fund	Subject	Requested Amount
Construction	2017	0100 - General Fund	2322 - Construction, Buildings	\$19,400,000
Construction	2017	0302 - Foundation/Other Grants/Contracts	2322 - Construction, Buildings	\$4,000,000
Total				\$23,400,000

Project Costs

Cost Type	Total Project Costs	Requested Funding	DGS Rec
Acquisition Cost	\$0	\$0	
Building & Built-in Equipment	\$13,940,000	\$13,940,000	
Sitework & Utility Construction	\$2,137,000	\$2,137,000	
Construction Cost Total	\$16,077,000	\$16,077,000	
DESIGN & RELATED SERVICE ITEMS			
A/E Basic Services	\$2,187,000	\$2,187,000	
A/E Reimbursables	\$46,000	\$46,000	
Specialty Consultants (Food Service, Acoustics, etc.)	\$102,000	\$102,000	
CM Design Phase Services	\$234,000	\$234,000	
Subsurface Investigations (Geotech, Soil Borings)	\$31,000	\$31,000	
Land Survey	\$10,000	\$10,000	
Archeological Survey	\$0	\$0	
Hazmat Survey & Design	\$0	\$0	
Value Engineering Services	\$0	\$0	
Cost Estimating Services	\$12,000	\$12,000	
Other Design & Related Services	\$122,000	\$122,000	
Design & Related Services Total	\$2,744,000	\$2,744,000	
INSPECTION & TESTING SERVICE ITEMS			
Project Inspection Services (inhouse or consultant)	\$753,000	\$753,000	
Project Testing Services (conc., steel, roofing, etc.)	\$102,000	\$102,000	
Inspection & Testing Services Total	\$855,000	\$855,000	
PROJECT MANAGEMENT & OTHER COST ITEMS			
Project Management (inhouse or consultant)	\$610,000	\$610,000	
Work By Owner	\$61,000	\$61,000	
BCOM Services	\$10,000	\$10,000	
Advertisements	\$0	\$0	
Printing & Reproduction	\$0	\$0	
Moving & Relocation Expenses	\$71,000	\$71,000	
Non Built-In Data and Voice Communications	\$305,000	\$305,000	
Signage	\$25,000	\$25,000	
Demolition	\$0	\$0	
Hazardous Material Abatement	\$15,000	\$15,000	
Utility Connection Fees	\$0	\$0	
Utility Relocations	\$458,000	\$458,000	
Commissioning	\$193,000	\$193,000	

Miscellaneous Other Costs	\$434,000	\$434,000
Project Management & Other Costs Total	\$2,182,000	\$2,182,000
Furnishings & Movable Equipment	\$1,221,000	\$1,221,000
Construction Contingency	\$321,000	\$321,000
TOTAL PROJECT COST	\$23,400,000	\$23,400,000

Capacity

Cost Type	Unit of Measure	Units	Cost Per Unit
Acquisition Cost		0	\$0
Construction Cost	GSF	30,000	\$536
Total Project Cost	GSF	30,000	\$780

Operating and Maintenance Costs (Agency)

Cost Type	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
GF Dollars	\$0	\$0	\$353,017	\$363,608	\$374,516	\$385,752
NGF Dollars	\$0	\$0	\$72,305	\$74,474	\$76,708	\$79,009
GF Positions	0.00	0.00	1.99	1.99	1.99	1.99
NGF Positions	0.00	0.00	0.41	0.41	0.41	0.41
GF Transfer	\$0	\$0	\$0	\$0	\$0	\$0
GF Revenue	\$0	\$0	\$0	\$0	\$0	\$0
Layoffs	0	0	0	0	0	0

Planned start date of new O&M costs (if different than the beginning of the fiscal year):---

Supporting Documents

File Name	File Size	Uploaded By	Upload Date	Comment
06-CR-3 Translational Medicine Building.xls	625,664	Rob Mann	6/13/2015	CR-3_Translational Medicine Center

Workflow History

User Name	Claimed	Submitted	Step Name
Rob Mann	05/18/2015 11:40 PM	05/18/2015 11:40 PM	Enter Capital Budget Request
Rob Mann	05/18/2015 11:40 PM	05/18/2015 11:40 PM	Continue Drafting
Rob Mann	06/08/2015 05:40 PM	06/08/2015 05:41 PM	Continue Drafting
Jennifer Hundley	06/12/2015 04:48 PM	06/12/2015 05:43 PM	Continue Drafting
Jennifer Hundley	06/13/2015 06:32 AM	06/13/2015 06:32 AM	Continue Drafting
Rob Mann	06/13/2015 09:03 AM	06/13/2015 09:16 AM	Continue Drafting
Rob Mann	06/13/2015 12:52 PM	06/13/2015 12:55 PM	Agency Review Step 1
Rob Mann	06/13/2015 07:19 PM	06/13/2015 07:22 PM	Agency Review Step 1
Bob Broyden	06/14/2015 02:18 PM	06/14/2015 02:18 PM	Ready for DPB Submission
			DPB Review