

State Council of Higher Education for Virginia Agenda Item

Item: #B.3 – Policy Briefing – Academic Research: Challenges and Opportunities for the Commonwealth

Date of Meeting: January 9, 2012

Presenter: Alan Edwards, Director of Policy Studies

Most Recent Review/Action:

- No previous Council review/action
 Previous review/action

Date:

Action:

Background Information/Summary of Major Elements:

Academic research is a significant component of Virginia higher education and has been a major issue for the Council for decades. This briefing session affords the Council an opportunity to review research-related activities and progress over the past decade; to better understand current efforts, recent developments, and future challenges and opportunities; and to discuss potential policy strategies for supporting the academic-research enterprise in the Commonwealth.

Materials Provided: Presentations from the invited speakers will be distributed at the meeting. Contained on subsequent pages here is background and contextual information intended to provide a baseline understanding in advance of speakers' presentations and Council's discussion. This information will be summarized by Dr. Edwards in an introductory presentation January 9.

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Financial Impact: None

Timetable for Further Review/Action: Follow-up discussion, report-drafting, and/or subsequent action are at the discretion of the Council.

Resolution: None

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Introduction and Overview

In 2002, the Council issued the report, “Condition of Research at Virginia Colleges and Universities,” which compared the Commonwealth’s academic-research output and capacity with high-performing institutions and states and pointed to investment in academic research as a means of advancing Virginia.

This study laid the groundwork for a decade of related reports, policy and funding initiatives, and an ongoing state-level focus on academic research as a strategic tool in spurring not only knowledge generation and advancement, but also innovation, entrepreneurship, commercialization, and economic development. The Council’s 2012 policy briefing on academic research is an opportunity to review past progress, better understand current efforts and realities, and explore challenges and opportunities for support of academic research going forward.

The 2002 study reported that, according to National Science Foundation data, Virginia’s total research and development expenditures (total of industrial, federal, academic, and other) in FY1998 were almost \$5 billion – ranking Virginia 12th in the nation, with academic-research expenditures of almost \$500 million, which ranked 15th highest in the U.S.

Since then, the Commonwealth and its universities have focused significant attention on academic research; the General Assembly has supported multiple funding initiatives to improve Virginia’s academic-research standing; and policy makers have offered various recommendations for removing impediments and improving research capacity. However, other states also have undertaken such efforts.

As a result, most-recent NSF data indicate that, while Virginia’s total expenditures for research have grown by over 93% -- to almost \$9.5 billion in FY2007, the Commonwealth is now ranked 13th nationally. And while our academic-research expenditures have grown to over \$1 billion annually (an increase of over 125%), the Commonwealth’s national ranking has improved only to 14th (in FY2009).

To assist the Council in understanding the academic-research enterprise and its recent history in the Commonwealth, this document: (i) provides an overview of state funding for academic research; (ii) reviews major initiatives over the past decade; and (iii) summarizes relevant recommendations regarding Virginia’s academic-research enterprise. Offered as baseline information, this document sets the stage for the expert presentations that Council will receive from its invited speakers on current efforts and challenges and future opportunities and strategies.

State Support for Academic Research

The Commonwealth supports the academic-research enterprise at public institutions in various ways. Two of the major budgetary funding streams are: (1) Educational and General Programs; and (2) Financial Assistance for E&G Services.

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E&G Programs is financed by the general fund and tuition and fees, and research is one of its various components (along with instruction, academic support, student services, institutional support, and operation and maintenance of facilities/plant). Given the Commonwealth's historical focus on instruction, particularly at the undergraduate level (echoed today in the Top Jobs legislation's focus on 100,000 additional degrees/graduates), research has never received a significant share of E&G funding. Generally, academic research accounts for about 3% of the almost \$4 billion E&G budget.

Financial Assistance for E&G Services is the primary conduit of financial support for academic research, and Sponsored Programs is its largest component, totaling about \$1.2 billion annually. This section of the budget reflects external grants and contracts, which constitute about 99% of it. Of this \$1.2 billion, over 90% of it passes through the budget to six universities – College of William and Mary, George Mason University, Old Dominion University, University of Virginia, Virginia Commonwealth University, and Virginia Tech, with UVa, VCU, and VT accounting for about 70% of it.

Also appearing in Sponsored Programs is the Higher Education Research Initiative, through which flows most direct state support for academic-research activities. These funds have varied greatly over the past decade, with appropriations in FY07 and FY08 exceeding \$30 million annually, but then being reduced by about half in FY09-FY11.

- In FY12, the Higher Education Research Initiative received additional funds after Governor McDonnell and the 2011 legislature allocated \$15 million for specific STEM-related research.
- For FY13 and FY14, Governor McDonnell's introduced budget proposes \$12.4 million each year in academic-research funding to: (i) create a cancer research and treatment pool (\$6 million); (ii) create a competitive grant program for all public institutions (\$2.6 million); and (iii) support specific institutional research initiatives (\$3.8 million).

State funds to support the academic-research enterprise also appear beyond the budget sections discussed above. For example:

- appearing in the Financial Assistance for Economic Developments section of the FY12 budget were \$6 million for the Commonwealth Research Commercialization Fund and \$4 million for the Center for Innovative Technology to provide "gap"-fund grants; and
- Governor McDonnell's introduced budget for FY13 and FY14 includes: (i) \$5 million each year to match private funds for a life-sciences research initiative (in Commerce and Trade); and \$1.8 million each year for research at Jefferson Lab (\$500K) and Institute for Advanced Learning and Research (\$600K) and for collaboration-promotion for and marketing of simulation and modeling by CIT (\$650K).

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While its budget recommendations may include specific research projects or programs, the Council generally supports academic research directly or indirectly through its recommendations on such items as cost of education, faculty salaries, capital outlay, facility operations and maintenance, financial assistance to graduate students, equipment, and library materials.

- In 2007, the Council modified its fixed-asset (capital-outlay) guidelines to allow research-space needs to be calculated prospectively, rather than retrospectively, thereby enabling the state to anticipate research-space needs and enhancing institutions' ability to secure research sponsorship.
- The Council historically has advocated for undergraduate and graduate student assistance. In recent years, the Council consistently has recommended that assistance for graduate students – who are often the academic-research labor force – be increased to cover the same proportion of average full-time tuition and fees as in FY95.
 - In FY95, the average Virginia Graduate Commonwealth Award (\$569) covered 13.2% of average graduate T&F; today's average award (\$690) covers only 7.3%.
 - For the 2012-14 biennium, the Council recommended \$10.7 million in general funds for graduate-student assistance; the introduced budget contains no additional graduate-student support.
- The Higher Education Equipment Trust Fund, which supports institutional purchases and replacements of instructional and research equipment, has been described as the “crown jewel” of state support for academic research, and the Council has been a strong advocate for it.
 - For the 2012-14 biennium, the Council recommended \$13 million in general funds for HEETF debt service in FY14 to provide \$82 million per year in additional or replacement equipment. The introduced budget proposes \$8.8 million in FY14 debt service to provide a \$56 million allocation per year to support equipment replacement, including computers for instruction and specialized research equipment.
- For the 2012-14 biennium, the Council recommended an additional \$2.8 million in each year to support cooperative library purchases in science, technology, engineering and math disciplines. These digital library materials will provide individual investigators and research teams with essential resources for designing clinical protocols, developing study methodologies, writing grants, and demonstrating the deep knowledge of their disciplines that funding agents require. The introduced budget supports the Council's recommendation in full.

Major Initiatives

One of the three major thrusts of the Governor's Commission on Higher Education Reform, Innovation and Investment was regional strategies and partnerships for research and economic development. This recent focus contributed to the \$25 million in additional FY12 funds discussed above, as well as changes to the

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Commonwealth Research Commercialization Fund, which will be discussed with the Council by panelists from CIT on January 9.

During the previous decade, three major state-level initiatives were undertaken regarding the academic-research enterprise.

1. The Commonwealth Technology Research Fund, the precursor to today's commercialization fund, was created in 2000 by the General Assembly and Governor Gilmore. Through this program, one-time funds were awarded to institutions: (i) as matching funds to leverage federal grants and private monies; (ii) to fund strategic academic enhancements; and (iii) to serve as inducements to foster industry partnerships and collaboration. Funding peaked in FY02-04 at almost \$25 million (mostly for strategic enhancements). By FY10-12, the CTRF had been defunded completely.
2. 2004's "Seed Money" Initiative was an \$8.3 million infusion of one-time "seed" funds from the legislature and Governor Warner, aimed at promoting collaborative, translational research that might result in more/better/quicker commercialization of academic discoveries. The initiative funded multiple projects at six research universities.
3. The largest state initiative for academic research, 2006's Commonwealth Research Initiative, involved the legislature's allocation of significant monies for operating and capital expenses related to research – facility and space construction, laboratory equipment, and academic-department capacity enhancement -- in support of Governor Warner's goal of reaching \$1 billion in academic research by 2010. It included over \$80 million for research-related capital projects, almost \$55 million for targeted research at six research universities, plus Eastern Virginia Medical School and the Institute for Advanced Learning and Research, and over \$10 million in pooled central account funds for the CTRF (\$6 million), the Virginia Economic Development Partnership, the Reeve Stem Cell Research Fund, and the Virginia Coastal Energy Research Consortium. The research initiative received considerably less support beyond the 2006-08 biennium.

These various initiatives involved both direct funding to individual institutions to enhance specific projects and departments, as well as pooled funding to encourage research commercialization. As illustrated above, funding levels have not been sustained over time and were at comparatively low levels prior to investments made by the General Assembly and Governor McDonnell earlier this year.

Return on Investment

Although Virginia's academic-research national ranking has remained little changed over the past decade, the Commonwealth's investment in the academic-research enterprise has yielded considerable, albeit sometimes difficult to quantify, results.

For institutions, the state's investments in academic research have enabled them to secure and leverage external federal and private funds. As a result, in part, of \$23.5

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million in 2006-08 research funding, the University of Virginia received \$93.6 million in external research funds. This is a significant return, even if not all of it can be attributed directly to state funding. As state investment expands academic-research capacity, institutions are aided in their abilities to recruit faculty and researchers, to acquire equipment, to target and advance strategic research priorities, and to improve students' educational experiences.

For the Commonwealth, investment in academic research yields more innovation, entrepreneurship, commercialization, and economic development. The research enterprise itself, the intellectual property it generates, and the application of research results benefit Virginia through patents and licenses, job creation, and services to citizens. For example, as a result of CTRF funds, the BioEclipse project, a collaboration between Eastern Virginia Medical School and Hampton University, is estimated to create 125 new jobs (with a minimum salary of \$70,000), will have an annual payroll of about \$2 million, and will serve more than 2,000 patients per year.

Conclusions

Since the Council's 2002 "Condition of Research" report, numerous studies have offered research-related findings and recommendations, including the Council's own 2003 and 2007 state-wide strategic plans for higher education. In addition, as a result of the 2005 Restructuring Act, information on academic research has become more accessible with the inclusion of the research universities' levels of sponsored research activity in the Institutional Performance Standards, as well as the current "Roadmap" effort undertaken by CIT, which will be discussed January 9.

In meetings of the Governor's Higher Education Commission, former VCU vice president Paul Timmreck (on behalf of the Virginia Business-Higher Education Council) and CIT president Pete Jobse provided excellent presentations that deftly summarized recent findings and recommendations regarding academic research in the Commonwealth. This document draws directly from both efforts.

- State financial support for academic research has been "erratic" over time.
- Despite a near doubling of academic-research expenditures over the past decade, Virginia's national ranking (14th) is little changed; and in per-capita comparisons with peer states, Virginia consistently ranks near the bottom.
- Virginia lags leading states in commercialization of academic research and in utilization of its universities to promote economic development. (Top states often have "eminent researcher" programs, research "centers of excellence," and focused, coordinated, state research efforts and strategies.
- Increased funding alone will not be sufficient to promoting academic research and research/technology commercialization. Also important will be:
 - alignment of the state's R&D strengths, priorities, and investments, and measurement of the outcomes thereof;
 - establishment of supportive policies and improvement of existing ones (.e.g., indirect-cost recoveries and funding-split exemptions); and

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- encouragement of more collaboration between higher education, federal agencies and labs, corporations, and nonprofit entities.
- “Without a sustained commitment that transcends gubernatorial administrations, Virginia’s research universities will not achieve their full potential to foster economic development through innovation.” (Quote from Slide 4 of Paul Timmreck’s 2010 Commission presentation.)

With this document as preface, SCHEV staff has invited four expert speakers to discuss with Council in more detail current activities and efforts and to explore ongoing and emerging policy issues that the Council and/or the Commonwealth should address in support of the academic-research enterprise in advancing knowledge, discovery, innovation, and economic development in Virginia.