

ENVISIONING VIRGINIA TECH

BEYOND BOUNDARIES

FUNDING MODELS AND VIRGINIA TECH

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“What is the right thing to do for tomorrow?”

Funding Models and Virginia Tech

As Virginia Tech moves towards becoming an internationally recognized, global land-grant institution, considering current and identifying new funding sources will be critical in its endeavor. Characteristics of world-class universities include “high levels of government and nongovernment sources of funding” that include “government budget funding for operational expenditures and research, contract research from public organizations and private firms, the financial returns generated by endowments and gifts, and tuition fees” (Salmi, 2009, p. 6, 23). This paper seeks to examine some of the challenges and opportunities associated with funding sources that Virginia Tech will face as it moves forward over the next 30 years and beyond. These areas include state appropriations, tuition and fees, endowment opportunities, federal dollars, and other opportunities.

Decreasing State Appropriations

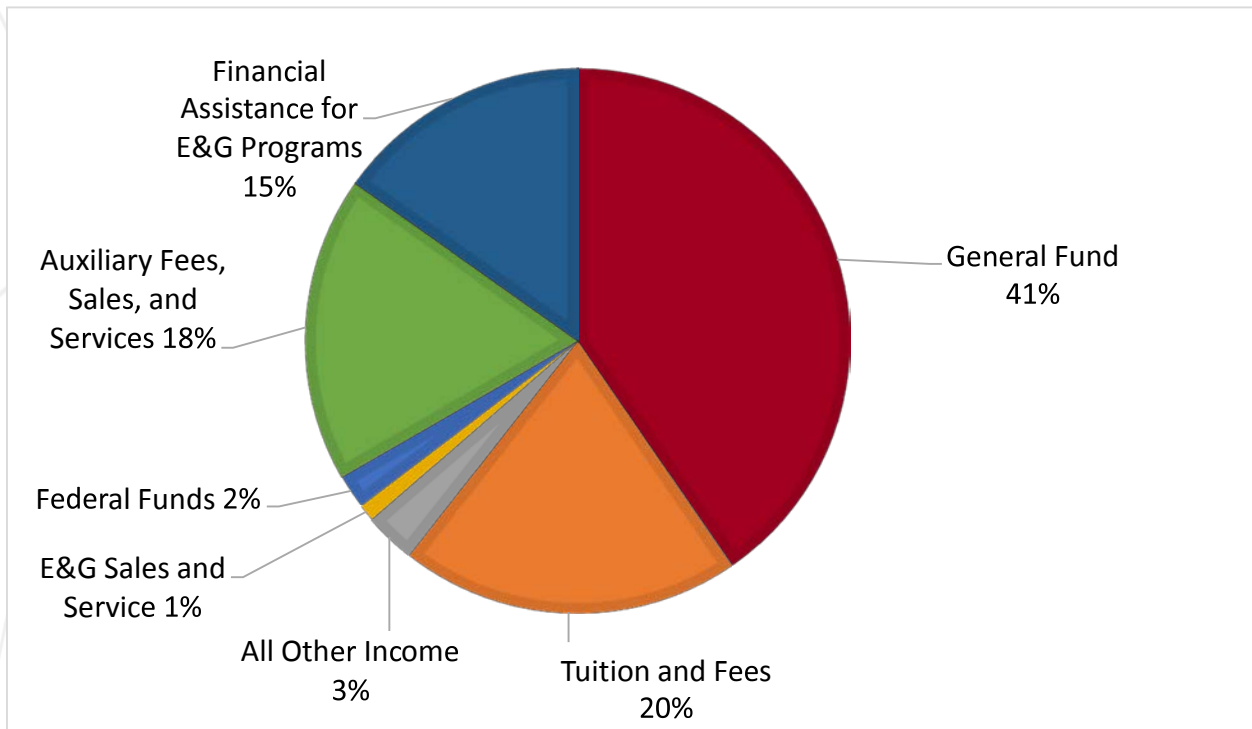
In the 1980s, public four-year institutions in Virginia maintained a 70/30 ratio of state/student funding (Virginia Tech, 2015). More recently, there has been a downward trend in public support of higher education institutions. In Virginia, since 1998, state funding for higher education has decreased \$2,831 per student, and the state spends approximately 25 percent less per student than the national average (JLARC, 2014). State funding for higher education in Virginia declined 27.89 percent in constant dollars between FY2008 to FY2013¹. Similarly,

¹ In FY08, Virginia Tech received \$8,373 GF per resident student. In FY13, Virginia Tech received \$6,680 GF per resident student. Data obtained by the Office of Budget and Financial Planning, May 4, 2015.

between FY2002 and FY2015, the state funded portion of Virginia Tech's annual operating budget (University Division and Cooperative Extension and Agricultural Experiment Station Division) declined from 39 to 18 percent (Office of Budget and Financial Planning, 2014).

Figure 1

Virginia Tech Office of Budget and Financial Planning Total Revenue Sources, 2000-2001

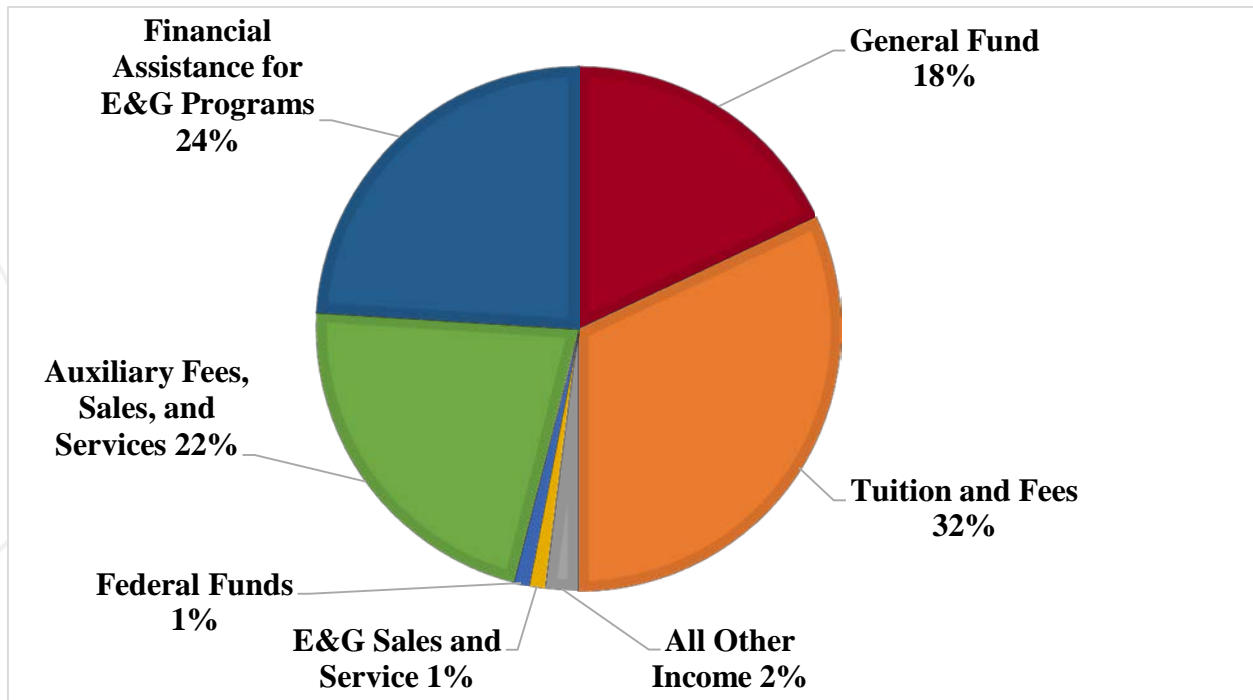


Source: Virginia Tech. Office of Budget and Financial Planning. (2000). 2000-2001 authorized budget document.

Figure 1 shows the revenue sources for Virginia Tech in 2000-2001. The general fund accounted for 41 percent of the revenue for the university, while tuition accounted for 20 percent (Virginia Tech, 2000). By FY 2015-2016, the funding model had shifted in such a way that the largest portion of revenue for the university came from tuition and fees, while state funding dropped to only 18 percent of Virginia Tech's revenue (Virginia Tech, 2015).

Figure 2

Virginia Tech Office of Budget and Financial Planning Total Revenue Sources, 2015-2016



Source: Virginia Tech. Office of Budget and Financial Planning. (2015). 2015-2016 authorized budget document.

As a result, tuition and fees have increased to help mitigate the reduction of state support and cover unavoidable cost increases as well as state cost assignments. With declining public financial support comes increasing pressures on leaders to both manage their costs efficiently and be innovative in the ways in which universities generates revenue.

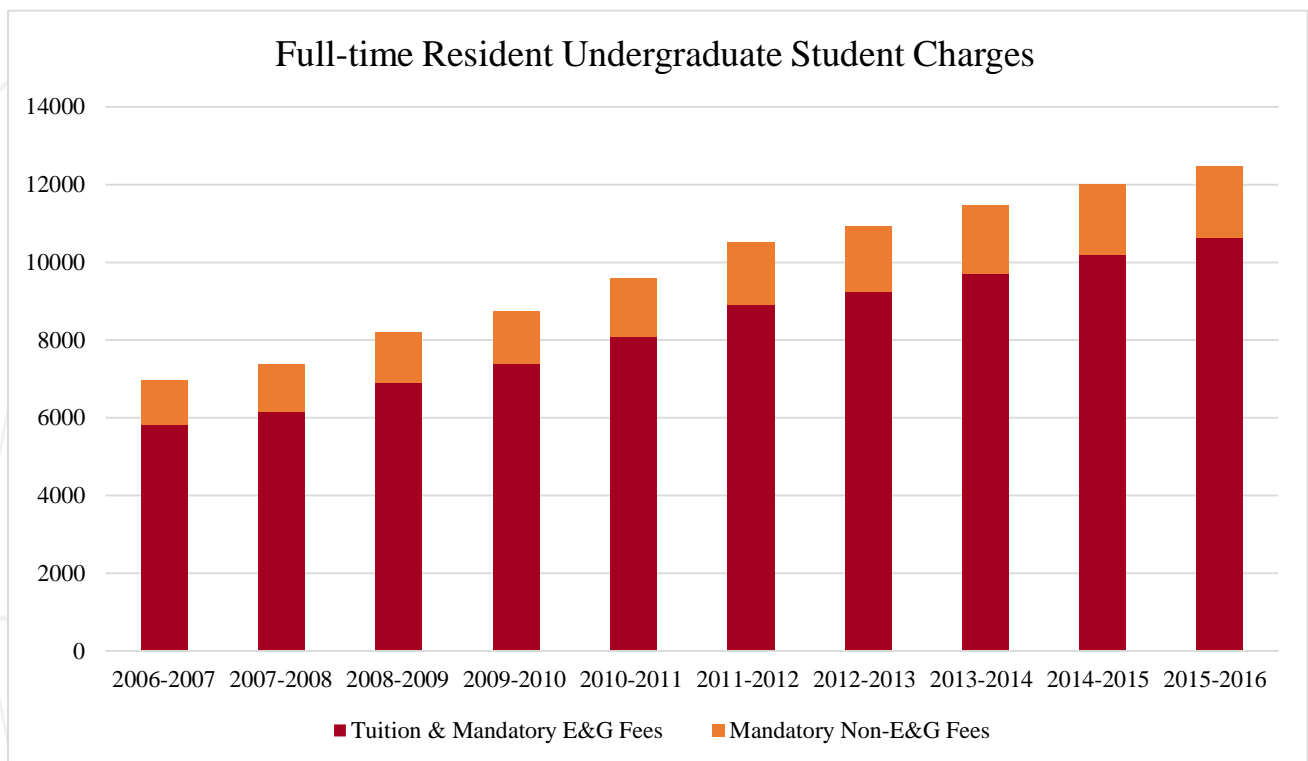
Tuition and Fees

With the growing gap between state funding and the cost of higher education, the need to recoup the expenses of education is falling more and more on the students and their families. This means that tuition and fees, as well as student debt, are steadily increasing. In-state tuition and fees at Virginia Tech were \$2,019 for the 1985-1986 academic year (SREB, 2000). If tuition

had risen solely at the inflation rate based on the Consumer Price Index, in-state tuition and fees at Virginia Tech today would be \$4,442² (United States Department of Labor, 2015). Instead, 2014-15 tuition and fees for in-state students at Virginia Tech is 270 percent more than the inflation-adjusted 1985 rate (SREB, 2000). Figure 3 illustrates the increases in both tuition and mandatory E&G fees and mandatory non-E&G fees between academic years 2006-2007 and 2015-2016 (SCHEV, 2015).

Figure 3

Virginia Tech Full-time Resident Undergraduate Student Charges (2006-2016)



Source: SCHEV, 2015

² Inflation rate calculated using the United States Department of Labor calculator http://www.bls.gov/data/inflation_calculator.htm

Issues of affordability and accessibility need to be addressed as tuition rates increase.

The university's land-grant mission to be accessible to and in service to Virginia residents in part drives the demand to constrain tuition costs. However, because of a combination of factors including declining state appropriations per student, tuition and required fees for in-state students grew by 96 percent while tuition and required fees for out-of-state students grew by 63 percent over the past decade. In-state undergraduate students for the 2005-2006 academic year were charged \$6,378 while out-of-state undergraduate students were charged \$17,836 (University Bursar, 2005). For the 2015-2016 academic year, in-state undergraduate students were charged \$12,485 compared to the \$29,128 out-of-state undergraduate students will be charged in tuition and fees (University Bursar, 2015). As the need to reduce student loan debt, limit tuition increases, and maintain accessibility for all qualified students grows, the university must be innovative in how it manages its resources by both constraining costs and generating additional non-state-based revenue streams.

Endowment Opportunities

Endowments provide an additional and lasting revenue source to colleges and universities. "Independent colleges and universities always have considered their endowments to be a principle source of stability and consistent support. Public universities have also become more interested in endowments, operating in partnership with affiliated foundations to protect the income flow from the many vagaries of legislative appropriation" (Chabotar, 2006, p.81-82). In addition to creating fiscal stability, endowments often allow universities the ability to accomplish goals outside of their normal operating expenses, such as scholarships for students and funds for faculty talent recruitment. This funding mechanism is a key area that allows for growth.

Decreased funding trends at the state level mean that it is critical that Virginia Tech increase its endowment. Virginia Tech's nearly \$800 million endowment through the Virginia Tech Foundation provides faculty and research support, student scholarships and internships, and economic development in communities across the Commonwealth (Virginia Tech, 2014). In FY 2012-2013, the Virginia Tech Foundation contributed \$146 million "in support of the university," up from \$124.8 million in FY 2008-2009 (Virginia Tech, 2013). Potential growth opportunities make endowment funding an important resource for the university's future.

Virginia Tech ranked 116th out of 854 public and private colleges and universities with an endowment of \$796 million (National Association of College and University Business Officers, 2015). Table 2 shows the average endowment for our benchmarks at \$2 billion, with the median of our benchmarks being \$1.5 billion. Among our benchmarks, we ranked 19 out of 25 (See Appendix A for benchmarks). Ranked first among our benchmarks, and second among all public universities behind only The University of Texas system, is The University of Michigan at Ann Arbor. In 1988, the University of Michigan had an endowment of only \$300 million. Over the past 26 years, they have developed an endowment totaling \$9.7 billion (National Association of College and University Business Officers, 2015). According to University of Michigan's chief investment officer Erik Lundberg, this growth was due to the fact that the university is careful when investing, but more importantly, they are careful in the way that they spend endowment funds. Distributions from the endowment are limited to 4.5 percent of the total value of the endowment, averaged over the past seven years (Woodhouse, 2013). Virginia Tech decides its distribution rate annually based on the Consumer Price Index for the prior year. For FY 15, the approved range was 3.2 percent-4.7 percent based on program spending (Virginia Tech, 2014).

As Virginia Tech focuses on its goal of becoming an internationally recognized global land grant institution, endowment growth is important. Lundberg believes that there is a correlation between university endowments and academic excellence. “If you look at the highest ranking universities, they all have big endowments” (Woodhouse, 2013; see also Salmi, 2009). Giving is improved when the endowment is successful, as donors have more faith that their gifts are being used responsibly (Woodhouse, 2013).

Table 1

2014 Endowment Rankings of Benchmark Institutions

Rank	University	2014 endowment (in thousands)
9	University of Michigan at Ann Arbor	\$9,731,460
24	Ohio State University*	\$3,547,566
25	University of Pittsburgh main campus	\$3,492,839
27	Pennsylvania State University at University Park*	\$3,445,965
29	University of Minnesota-Twin Cities (and Fondation)*	\$3,164,792
31	University of Washington	\$2,832,753
32	UNC Chapel Hill (and Foundations)	\$2,695,663
33	Purdue University at West Lafayette*	\$2,443,494
34	University of Wisconsin Foundation*	\$2,332,185
36	University of Illinois at Urbana-Champaign (and Fondation)*	\$2,277,932
39	Michigan State University*	\$2,145,424
46	Georgia Tech (and Foundation)	\$1,889,014
59	University of Florida (and Foundation)*	\$1,519,522
61	University of California at Berkeley Foundation*	\$1,496,437
68	University of Missouri System*	\$1,440,561
89	University of Colorado Foundation	\$1,063,089
100	Rutgers University at New Brunswick*	\$918,575
103	North Carolina State University*	\$885,055
116	Virginia Tech Foundation*	\$796,437
121	Iowa State University (and Foundation)*	\$777,018
124	University of Arizona (and Foundation)*	\$760,679
150	University at Buffalo Foundation*	\$624,791
233	University of California at Davis Foundation*	\$313,876
254	University of Maryland at College Park*	\$273,090
288	State University of New York at Stony Brook Fondation	\$214,446

Source: NACUBO, 2015

Note: For the purpose of examining endowments, we started with peers SCHEV +4 institutions and removed university systems (University of Texas and Texas A&M) and private institutions (Massachusetts Institute of Technology, Cornell University, and University of Southern California). Final list located in Appendix B.

*Indicates land-grant institution

Table 2

Mean, Median and Range of Endowments of Benchmark Institutions, 2014

	2014 Endowment (in thousands)
Range (Maximum)	\$ 9,731,460
Range (Minimum)	\$ 214,446
Mean	\$ 2,043,306
Median	\$ 1,519,522
Land Grant Institutions Mean	\$ 1,669,704
Virginia Tech	\$ 796,437

Source: NACUBO, 2015

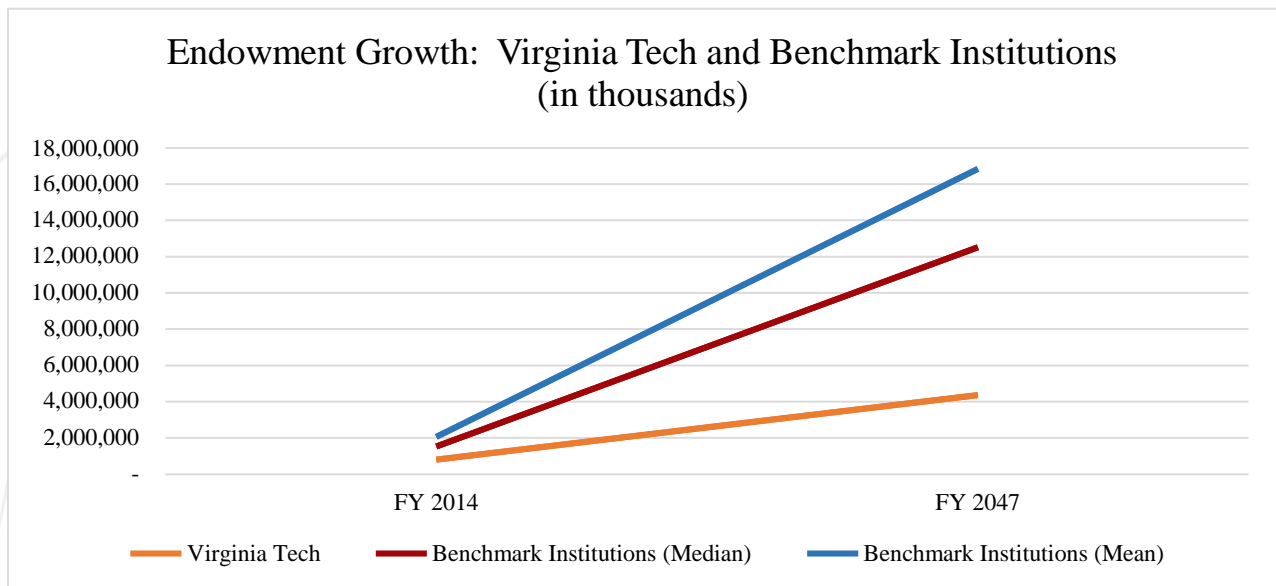
Note: For the purpose of examining endowments, we started with peers SCHEV +4 institutions and removed university systems (University of Texas and Texas A&M) and private institutions (Massachusetts Institute of Technology, Cornell University, and University of Southern California). Final list located in Appendix B.

Long-term growth for endowments aids a university's ability to plan for the future. Based on the current endowment (FY15) at Virginia Tech (\$796,437,000) and its average growth rate over the last ten years (8.46 percent), while adjusting this for inflation (3 percent), it is possible to project endowment trends for the university. Based on these calculations Virginia Tech will have an endowment of \$4,364,755,319 in the year 2047. In comparison, our benchmarks, based on the current mean endowment of \$2,043,306,502 with an average growth

rate over the last ten years (9.8138 percent), adjusted for inflation (3 percent), will have an average endowment of \$16,842,603,523.. Using the median for our benchmarks, the average endowment will be \$12,525,143,115. Based in these trends, it will be necessary for Virginia Tech to increase contributions to the endowment immediately, or the gap between it and its peers will expand exponentially.

Figure 4

Endowment Growth at 2047 by Virginia Tech and Benchmark Institutions



Source: NACUBO, 2015

Note: For the purpose of examining endowments, we started with peers SCHEV +4 institutions and removed university systems (University of Texas and Texas A&M) and private institutions (Massachusetts Institute of Technology, Cornell University, and University of Southern California). Final list located in Appendix B.

Federal Dollars

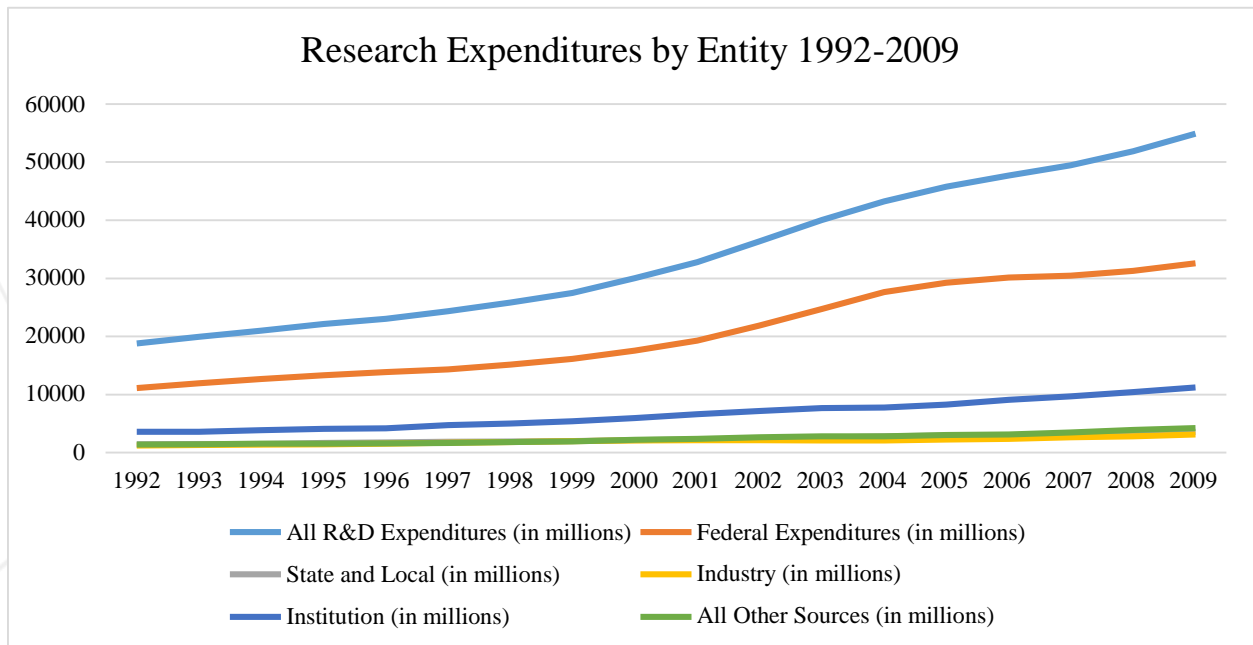
Recently, federal spending for higher education outpaced state funding. According to a 2015 report by The Pew Charitable Trust, “in 2013, federal spending on major higher education

programs totaled \$75.6 billion, state spending amounted to \$72.7 billion, and local spending was considerably lower at \$9.2 billion. These figures exclude student loans and higher education- related tax expenditures” (The Pew Charitable Trusts, 2015). The \$75.6 billion of federal spending includes Federal Pell Grants, Federal research grants, federal veterans’ educational benefits, general-purpose appropriations and other federal financial aid grants and grant programs (The Pew Charitable Trust, 2015). State funding was made up of \$53 billion in general-purpose appropriations, \$10.1 billion in state research, agriculture, and medical appropriations, and \$9.6 billion in state financial aid grants (The Pew Charitable Trust, 2015).

According to the most recent rankings, released February 2015 by the National Science Foundation, Virginia Tech is currently ranked 38th for research and development expenditures (National Science Foundation, 2015). For FY 13, the university was awarded \$496 million, up from \$454 million in FY 12. These awards, a major piece of federal funding for the university, play a significant role not only in the research efforts at Virginia Tech, but also in the university’s national and international reputation. While many surveyed in the 2013 presidential search process believed that the university’s focus on research has had a negative impact on the quality of teaching and learning, research funding plays a major role in supporting the university’s comprehensive mission (Virginia Tech Presidential Search, 2013).

Figure 5

Research Expenditures by Entity, 1992-2009



Source: NSF, 2011

Although federal spending for research has improved since 2006, “the growth rates were well behind the pace of gross domestic product (GDP) expansion” (Borouh, 2013). In the past, “total R&D spending outpaces that of GDP-regardless of whether the averaging period is the past 5, 10, or 20 years” (Borouh, 2013). With changes in federal funding, opportunities to capture necessary research dollars must be found in other areas. Universities working to build a greater presence in the global sphere can build relationships with international funders as well as other national governments that have research or other types of funding available for higher education (Altbach & Knight, 2007).

Other Areas to Consider

While it is suggested that the above four areas: state appropriations, tuition and fees, endowments, and federal funding, will continue to make up the lion's share of higher education funding, there are many innovative ideas trending in higher education currently that may impact traditional college and university funding models. Some of these other sources of funding include partnerships, corporate collaborations, intellectual property, startups and entrepreneurship. Many of these areas are critical for the growth of universities and the creation of knowledge. I address the possibilities and challenges of these areas are addressed in regards to their potential success as funding sources.

Creating a Critical Mass

Creating a critical mass is one of the ways in which colleges and universities are combating the changes in funding that are occurring in higher education. This is being accomplished in a variety of ways, such as the merging of schools in an attempt to decrease overhead and administrative costs and growing enrollments. In Georgia, for example, the Board of Regents in 2013 voted to merge eight of its state colleges into four in order to reduce the overall costs of higher education in the state (Diamond, 2013). Although the mergers at the schools are ongoing and we do not yet know the total impacts, one of the newly created unions, Georgia Regents University, a merger between Augusta State University and Georgia Health Sciences University, has reported a 10 percent decline in the administrative costs (Jones, 2014).

Increasing enrollment is another way that some universities are using as a way of creating a critical mass. According to the National Center for Education Statistics (NCES), enrollment increased 24 percent between 2000 and 2012 for degree granting institutions nationally (U.S. Department of Education, 2015). This trend is expected to continue with the total number of

college enrollments estimated to be 20,186,000 by the year 2023 (U.S. Department of Education, 2015). Virginia Tech has the opportunity to use this increase to maintain a critical mass of students. In the June 2015, Board of Visitors meeting, it was announced that Virginia Tech will have an additional 500 freshman entering in Fall 2015, with a possible growth to 29,000 total undergraduate students by 2022 (Sands, Smith & Dean, 2015). This increase in students can contribute to the economies of scale that can lower the cost of attending the university, however, maintaining the quality of service will remain an important issue with increased enrollments. In addition, state funding will also need to increase to meet the growing student population.

Figure 6

Total Undergraduate Enrollment for 4-Year Institutions



Source: U.S. Department of Education, 2015

Partnerships/Collaborations

Colleges and universities seeking to find new methods of funding have begun to form a variety of partnerships. These partnerships, with other universities, corporations, and nonprofits, have not only allowed for shared risks and expenses, but also created opportunities in the fields of research and education. They allow universities the opportunity to leverage their assets in ways that would be impossible for them to do alone.

In the creation of partnerships, the important question that needs to be addressed is whether or not the partnership offers something to Virginia Tech that it cannot create on its own. Virginia Tech has its own funding, tax breaks, etc. As a result, partnerships should be created not as an alternative source of funding, but instead looked at as a value adding activity. It is critical that the university is careful in the partnerships it enters into. Examples of partnerships at Virginia Tech include the Virginia Tech Wake Forest University School of Biomedical Engineering and Sciences, Virginia Tech Carilion School of Medicine and Research Institute, and the Virginia-Maryland College of Veterinary Medicine.

The Virginia Tech Carilion School of Medicine and Research Institute (VTC) is an example of a partnership that used innovation in its creation, execution and funding. Created in 2007 as a public-private partnership between the university and Carilion Clinic, the new medical school seeks to leverage the basic science and research conducted at Virginia Tech and merge it with the medical skills of the clinicians at Carilion Clinic as a way of training doctors who will be both research and patient focused when they graduate (About VTC, 2015). In addition, the two entities, Virginia Tech and Carilion, share resources such as academic infrastructure, experiences medical and research staff, and operational funding (Steger & Murphy, 2008).

Another trend is the partnership of universities with corporations in order to create new infrastructure. One example of this is at Drexel University in Philadelphia where the university has embarked on partnerships with developers to provide student housing and retail space. They did this by renting land to private developers and paying nothing in terms of construction costs. In addition, Drexel forged a partnership with Barnes and Noble for the upgrade and operation of the university bookstore (Tucker, Campbell, & Lin, 2015).

Another example is the North End Center, where Virginia Tech partnered with the Virginia Tech Foundation and local developer Bob Peck in order to purchase the site that “includes a 141,000-gross-square-foot building of mixed-use office and retail space and an 800-space parking garage. The first floor of North End Center is leased for retail and restaurant space. The university leases the remaining floors from the Virginia Tech Foundation” (Virginia Tech, 2015). This unique situation, where Virginia Tech partners with itself (the Virginia Tech Foundation) can create possibilities for funding for projects that would otherwise be cost prohibitive. Other examples where the university has partnered with the Virginia Tech Foundation include The Hotel Roanoke and Conference Center, the Corporate Research Center, Kentland Farm, and the Washington-Alexandria Architecture Center.

Intellectual Property, Startups, and Entrepreneurship

In 1980, the Bayh-Dole Act (PL 96-517) allowed for inventions created as a result of federal funding to be patented by colleges and universities and gave these institutions that ability to license these innovations. The proceeds from these activities were shared by the inventors and the universities at which the research was conducted. As a result of this law and continued innovations, many universities began to focus on the possibility of creating revenue streams as a result of intellectual property.

Technology licensing, venture capital, corporate and public-private partnerships may offer new avenues for funded research. Technology transfers offer universities the ability to capitalize on research that is paid for by federal funds and conducted by faculty members (Hollingsworth, 1999). For example, MIT is seeking to increase revenue by fostering an environment for “inventors as they seek to translate their fundamental discoveries into production-ready products” (MIT, 2014). In addition to helping inventors with the patent process, MIT also plays a fundamental role in helping researchers who wish to create start-up companies as a result of their research (Fisher, 1998). The technology incubator at North Carolina State University similarly helps match talented entrepreneurs and researchers with start-up capital to market their ideas (Higher Education Works, 2015). Additionally, Stanford University started its Office of Technology Licensing in 1970 and has remained on the forefront of the process by working as a marketing, rather than a legal office, staffed by employees who understand the technology that has been created (Fisher, 1998).

The creation of labs that are sponsored, either fully or partially, by corporations is another way in which universities can limit costs while still creating innovative programs. Examples of this include the MIT Media Lab which offers corporations the opportunity to sponsor either particular labs or specific projects (MIT Media Lab, 2015). MIT offers a variety of sponsorship levels that include “access to all of the research conducted at the Lab, Lab-wide visiting privileges,” “non-exclusive, license-fee-free, royalty-free licensing rights for IP,” the ability to sponsor graduate fellows, or even have an employee in residence (MIT Media Lab, 2015).

Universities seem to be moving away from the push for intellectual property because the chances of this being successful is a gamble. A culture of entrepreneurship is important for

recruiting of students and faculty, and intensifying innovation. However, innovation and technology licensing should not be looked at as a primary new funding source.

Conclusion

Higher education funding sources are changing, and this research suggests that they will continue to evolve in the next generation. This paper provides a broad overview of current funding trends in the areas of federal and state funding, endowments growth, tuition and fees, and partnerships, as well as other areas of consideration. In addition to this paper, graduate students assigned to this thematic area will provide supplemental research to the working group as we move forward in the visioning process. Suggested ideas include innovation districts, capital projects, student debt, and affordability and accessibility.

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Appendix A: Benchmark Institutions for Beyond Boundaries

Cornell University
Georgia Institute of Technology
Iowa State University
Massachusetts Institute of Technology
Michigan State University
North Carolina State University
Pennsylvania State University
Purdue University
Rutgers, The State University of New Jersey
Texas A&M University
The Ohio State University
University at Buffalo
University of Arizona
University of California, Berkeley
University of California, Davis
University of Colorado Boulder
University of Florida
University of Illinois at Urbana Champaign
University of Maryland, College Park
University of Michigan
University of Minnesota
University of Missouri
University of North Carolina at Chapel Hill
University of Pittsburgh
University of Southern California
University of Texas at Austin
University of Washington
University of Wisconsin-Madison
Virginia Polytechnic Institute and State University

Appendix B: Benchmark Institutions for Endowment Comparisons

Georgia Institute of Technology
Iowa State University
Michigan State University
North Carolina State University
Pennsylvania State University
Purdue University
Rutgers, The State University of New Jersey
The Ohio State University
University at Buffalo
University of Arizona
University of California, Berkeley
University of California, Davis
University of Colorado Boulder
University of Florida
University of Illinois at Urbana Champaign
University of Maryland, College Park
University of Michigan
University of Minnesota
University of Missouri
University of North Carolina at Chapel Hill
University of Pittsburgh
University of Washington
University of Wisconsin-Madison
Virginia Polytechnic Institute and State University

Appendix C: Boundaries and Moon Shots

Boundaries

- State appropriations
- Capital projects
- Tuition
- Grants and federal funding
- Contracts
- Corporate funding
- Endowment growth

Moonshots

- Appropriation-free education (replace state funding with endowment or other source(s))
- Campus Auxiliary Services (ways to generate revenue from non-university community)
- Capital projects (will the campus of the future require the same sorts of building we are constructing currently)
- Tuition alternatives (enhanced work study; after graduation, public service work X years for Y funding)
- Tiered amenity expenses (value & premium options available for students on dorms, meal plans, exclusion from certain amenities such as athletics)
- Creating a critical mass (through economic development, transportation improvements, increased enrollments, innovation districts)