Ensuring Public Research Universities Remain Vital

A Report to the Membership on the Research University Regional Deliberations

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Association of Public and Land-grant Universities

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INTRODUCTION

United States public research universities face greater challenges than in recent decades to serve the growing national needs for highly educated graduates, new knowledge and community engagement. While greatly exacerbated by current economic conditions, these challenges are the accumulation of at least two decades of policies and declining public investment as discussed in the Association of Public and Land-grant Universities (A·P·L·U) background paper, *Forging a Foundation for the Future: Keeping Public Research Universities Strong*.

During April 2010, A·P·L·U conducted a series of five regional meetings, hosted by member institutions, to consider questions related to the future viability of public research universities. The meetings were hosted by the:

- University of Texas System, Austin, TX
- University of Georgia, Athens, GA
- University of Washington, Seattle, WA
- University of Wisconsin, Madison, WI
- Rutgers, The State University of New Jersey, New Brunswick, NJ

Each host president/chancellor invited distinguished individuals from industry, government and the academic community to provide remarks as a preface to a series of small group discussions. The presidents, chancellors, provosts and chief research officers and other senior executives attending each meeting deliberated over the issues.

This paper highlights the central threads of those rich and varied deliberations and was circulated widely among A·P·L·U member universities and revised to reflect their concerns and suggestions. Specifically, input on the paper was sought during the Council of Presidents meeting in June, the Council on Academic Affairs meeting in July and the Council on Research Policy & Graduate Education and Council on Governmental Affairs meetings in August. This is the final paper for distribution. Its conclusions will add to our ongoing advocacy work in collaboration with the Association of American Universities (AAU) and the Council on Governmental Relations (COGR).

Both sustained growth in federal research funding and further opening U.S. immigration policy to facilitate inflows to universities of highly capable human resources, including non-U.S. students and post doctoral fellows, are required for the future prosperity of this nation. These twin core components of the academic enterprise are not considered much in this paper, as they are already part of our agenda.

The first section of this paper, *The Role of Public Research Universities*, reviews the core contributions made by public research universities to the state and nation. The second, *Reaffirmation of Our Public Purpose: Commitments for the Future*, reviews and reaffirms the public purpose mission of public research universities by emphasizing the commitments made collectively to pursue objectives vital to this nation's future. The third section, *Reforms to the Facilities and Administrative Cost Practices of the Federal Government*, advances the reasonable proposition that the federal government must pay its appropriate share of the costs of federal research performed by public research universities to ensure these universities remain vibrant. The final section, *Supplemental Funding*, puts forth three models to provide funds to research universities to strengthen their educational and research programs.

THE ROLE OF PUBLIC RESEARCH UNIVERSITIES

Innovation and research are critical elements to each nation's success in the highly competitive global marketplace. Many of the most competitive innovations arise from the basic and applied research activities conducted at research universities. Without these contributions, life today would be far less productive, far less rewarding, far more mysterious, and dramatically shorter.

In the United States, our modern research universities, both public and private, thrive on the synergy flowing from the mix of research, graduate study and undergraduate instruction. They are critical to sustaining a competitive growing economy that provides adequate and well-paying jobs. Those countries providing the greatest economic challenges to the United States today in food, health, energy, and environmental progress primarily launch those challenges from sophisticated technological developments that arise from research. The appropriate response to their challenges is to rapidly and steadily add to our knowledge base which Americans do best through university-based education and research.

Indeed, the prosperity of individual citizens largely and increasingly depends on the acquisition of higher education. Earnings of college graduates are approximately twice the amount of high school graduates and that multiple has increased steadily since 1980. High school graduates have an unemployment rate more than double that of college graduates while community college graduates are about 1.7 times as likely to be unemployed as four-year college graduates.

Through the years, few sectors of American society have been as important to the strength of our nation as public higher education. As the country's needs have changed, public universities have rapidly adapted, preparing generations of students and researchers as well as making discoveries that enabled agricultural modernization, assembly line manufacturing, war mobilization, lifesaving healthcare and pharmaceutical advances, development of the transistor and microchip, space exploration, discovery of advanced materials, new methods of energy exploration and production, biofuels, solar energy, genetics, genomics and countless other timely, cutting-edge developments.

Founded with a public purpose that has been the touchstone guiding their activities for more than 150 years, public research universities have evolved to meet each generation's needs. In the period after World War II and the launch of Sputnik in 1957, public higher education faced dramatic increases in student enrollment and the assumption of a new role as a major producer of federally-funded research. Public higher education rose to the challenge. This period largely shaped the current model of the modern public university and this spirit of responsiveness continues today.

Each year, the United States depends on public research universities to:

- Educate 85 percent of undergraduate students and 70 percent of graduate students enrolled in *all* research universities
- Produce more than 50 percent of the doctorates granted in the United States in 11 of the 13 national needs categories—including 92 percent of doctoral degrees in agriculture, nearly 90 percent in natural resources and conservation, and 60 to 80 percent in computer and information sciences, engineering, foreign languages and linguistics, mathematics and statistics, physical sciences and security
- Serve as the primary route to a research university degree for minority students—more than 800,000 of the almost one million minority students enrolled in a research university are at public research universities—including Hispanic Serving Institutions, Tribal Colleges and Historically Black 1890 Universities.
- Offer distinct opportunities for minority Americans through the 17 Historically Black 1890 Universities and Tuskegee University. While their enrollment is open to all students, 81.5 percent of their enrollment (85,000 students) is African-American.
- Perform about 60 percent of the nation's federally funded university-based research—some $19.3 billion in 2008. The 1890 Universities are all research universities and, while small in enrollment and faculty, perform about $185 million of research annually.
- Serve as an engine for the economy—according to the Association of University Technology Managers—research at public universities in fiscal year 2008 led to:
  - 358 start-up companies,
  - 2,891 new technology licenses (16,555 are actively in force),
  - 6,460 applications for new patents, and
  - 1,791 patents.

Sustaining a competitive growing economy and providing adequate and well-paying jobs without developing new technologies and products and further enhancing productivity is nearly impossible. Other nations have cheaper labor forces that are increasingly becoming as skilled as those in the United States. America needs further assistance from its public research universities, assistance which these universities are prepared to give. Through the years, robust state support for these efforts has been critical. Unfortunately, state support has been eroding for several decades, and the current recession has exacerbated the problem.

REAFFIRMATION OF OUR PUBLIC PURPOSE: COMMITMENTS FOR THE FUTURE

The time has come for a new partnership between public research universities and society. Our nation relies on a higher education system operating in the land-grant tradition of integrating learning, discovery and engagement. With this in mind, below are some examples of commitments public research universities make to help ensure our country's future is brighter than our past.

More and better educated college graduates

- **Increase the number of college degree holders.** For generations, the United States has led the world in higher education. But today the nation has fallen to ninth in the proportion of young adults (age 25-34) who attain college degrees among the countries belonging to the Organisation for Economic Co-operation and Development (OECD). In Japan, Korea and Canada, more than 50 percent of young adults hold college degrees. Only 41 percent of Americans have earned a college degree. The country's international competitiveness depends on improving the proportion of our citizens holding tertiary degrees. Indeed, President Obama has established a goal of restoring United States leadership in tertiary degree attainment. Public research universities are broadly supportive of this goal and are necessary partners to achieve it.

  Many labor market indices confirm the need to increase tertiary degree attainment. The wage premium of college graduates over high school graduates continues to grow and unemployment rates for college graduates are less than half those of high school graduates. The College Board's *Education Pays 2010* amply demonstrates the rewards in numerous areas for those who earn bachelors, professional and graduate degrees.

  Public research universities are committed to making an important contribution to solving this problem. Many public research universities have the capacity to expand undergraduate enrollment and will do so. Others with relatively high graduation rates are working to graduate even more students. Some are doing both; expanding enrollment while striving to improve graduation rates. Other public universities are actively searching for students who left their studies just short of satisfying degree requirements and are advising them of feasible ways of completing their remaining degree requirements.

- **Control educational costs per degree.** Universities are being pressed to increase significantly the number of degrees granted even as they face at best flat state

appropriations due to increased competition for public funds by other social services/objectives. These twin pressures create the need to control, and if possible, to reduce, educational costs while at a minimum maintaining quality. Public research universities have a proud record of maintaining the real, per student cost of education at nearly the same level as 20 years ago. They will continue the diligent management practices producing this result. Nonetheless, the need to reduce cost per degree granted whenever possible remains. This can be achieved if graduation rates are increased and time to degree is shortened. Public research university efforts to achieve both are broadly underway and will be intensified.

The real *net* tuition and fees at four-year public universities are less than they were 15 years ago according to the College Board, having fallen from $2,030 in 1994-95 to $1,620 in 2009-10. [These "net tuition and fees" as calculated by the College Board exclude room and board and reduce tuition by grant aid from all sources and federal tax benefits. These figures are inflation adjusted.] [1] More and more public universities are putting in place programs to ensure students from low-income families can earn a degree without incurring debt. Increasing the probability of earning a degree and shortening the time to degree reduces the cost to the average student for a degree. Modest public research university cost to students can be projected into the future provided states cease their 20-year trend of reducing state appropriations per student.

Some existing public research university courses have been reengineered such that a higher portion of students satisfactorily complete the course work with better grades. In these flexibly redesigned courses, students generally complete the coursework in a shorter time period than a traditional semester long course and retain the knowledge gained for a longer period. These efforts generally produce increased student learning at lower cost per student and contribute both to increasing graduation rates and keeping instructional cost down.

Course redesign could produce greater economies of scale if course redesign efforts at one university were copied at other universities. This has been done to some extent by replication of Virginia Tech's Math Emporium by other universities but most course redesign never realizes true economies of scale. Great economies could be achieved if general education courses using the latest developments in learning theory were developed by faculty at leading public research universities for delivery in on-line or blended mode at other universities and community colleges. Such efforts now in the design phase hold dramatic promise for increasing learning effectiveness while reducing costs.

- **Provide improved non-traditional routes for earning degrees.** Much of the cost of attending a public research university is incurred in commuting, foregone earnings and living costs. Some of these costs can be mitigated if students attend and complete

[1] *Trends in College Pricing*, College Board, 2009, p. 11. "Net Tuition and Fees" as calculated by the College Board excludes room and board and reduces tuition by grant aid from all sources and federal tax benefits. These figures are inflation adjusted.

the first two years of undergraduate study at community colleges near their homes and seamlessly transfer to public research universities. Much has already been done to improve articulation and transfer from community colleges to public research universities and expanded efforts are underway. Public higher education can and will do more in this area.

Similarly, students can avoid many of these costs through distance education options. Public research universities offer excellent distance education programs that are growing in enrollment at annual rates greater than 15 percent annual rates. Efforts to understand barriers to offering distance education[2] will enable universities to continue this growth trend.

- **Ensure appropriate learning outcomes and be publicly accountable for doing so.** Of course, what one expects from higher education is learning and the development of skills and abilities. Achieving the goals of reducing the time required to earn a degree, reducing the cost of earning the degree or increasing the numbers of students earning degrees are for naught if substantial learning does not occur. In 2007, A·P·L·U member universities joined with the public colleges and universities in the American Association of State Colleges and Universities (AASCU) in an initiative to measure the value added during the educational process and to report publicly that information along with other data of interest to students and parents. Nearly 330 public universities, including roughly 70 percent of A·P·L·U's members, are participants in this effort known as the Voluntary System of Accountability (VSA). Each participating campus now posts and maintains its own College Portrait webpage. In addition, different methods of measuring learning outcomes are underway at other public research universities which do not participate in VSA.

Preparing high school students to be ready for college

- **Work to improve public education.** Public universities will continue to work closely with the public schools in their states to strengthen public education. The greatest impact universities have on public education is through the preparation and graduation of well prepared teachers. In 2008, A·P·L·U formed the Science and Mathematics Teacher Imperative (SMTI) with the goal of increasing the number and diversity of well-trained science and mathematics teachers produced by member schools. The initiative focuses on science and mathematics because our member universities have large and productive departments in those areas and academically talented students as majors. About 125 universities have committed to this effort, which has received initial funding from the Carnegie Corporation and several grants from the National Science Foundation to enable core A·P·L·U activities.

[2] *Online Learning As a Strategic Asset: Volumes I & II,* Association of Public and Land-grant Universities, 2009.

- **Support for the Common Core Standards Initiative.** Properly designed and widely adopted high school core standards would reduce the need for remedial work in college and improve student retention and graduation rates. Public research universities broadly support the effort launched by the Council of Chief State School Officers, the National Governors Association and Achieve. Many are working with the governors and chief school officers state-by-state to ensure strong national high school mathematics and English common core standards are put into place.

Continued discovery/new knowledge/more solutions/more jobs

- **Support state economic development goals while ensuring discoveries flow readily from the lab to the consumer.** Each public research university plays a key role in the economic development of its state. The core economic development function is the very high level workforce development that occurs in the classroom. Knowledgeable and well rounded university graduates become a principal magnet for attracting and retaining firms, and creating new firms within each state.

  Many public universities are making important contributions to their regional economies in ways that complement the traditional missions of their institutions—often without significant new investments or the creation of new organizational structures. This blending of state and regional economic development with the curricular efforts, faculty research, and technology transfer holds great promise for the future.

  Directly from the federal- and industry-funded research at public universities, flow many dollars into each state's economy, creating a significant number of jobs. Indeed, in many states the public research university is ranked among the largest employers because of the size of its learning and research enterprise.

  But a critically important core element of the public university economic development agenda is the commercialization of the research performed at those institutions. As the statistics above show, public research universities take technology transfer seriously. While graduation will always be the most meaningful flow of new knowledge from universities into the private sector, the flow of patents, licenses, and start-up companies will continue and grow at least as rapidly as university research funding grows. Our members will seek ways to make commercial access friendlier and easier, consistent with the legitimate constraints we face from conflict-of-interest and fair dealing rules and regulations of both federal and state governments.

International engagement

- **Internationalization.** Perhaps the strongest force for internationalization in most states is the public research university. In this "flat" world, bringing international

students and faculty to public research university campuses in significant numbers leavens the educational process and provides a window on the world for domestic students who have not been abroad. International faculty often are among the most productive researchers whose contributions enhance their university's research reputation and lead to the formation of start-up firms which can serve to attract investment capital into the state. Furthermore, public research universities have relatively large study abroad programs and provide a substantial portion of the roughly 262,000 American students who study overseas each year. Public research universities will continue to expand study abroad opportunities for students as they work to recruit the strongest faculty and students from throughout the world.

REFORMS TO THE FACILITIES & ADMINISTRATIVE COST PRACTICES OF THE FEDERAL GOVERNMENT

During the past 60 years, the federal government and research universities have shared an overarching objective to build and sustain the international leadership of the nation's research universities. One of the hallmarks of this partnership has been that each partner would shoulder an appropriate share of the costs common to research grants—the facilities and administrative costs (F&A costs). To make this collaborative relationship work well, the federal government developed common rules (Circular A-21) to avoid arbitrary practices, intending to promote efficiency, consistency, and uniformity across federal funding agencies and universities.

Today, as university-based research and graduate education are of increasing importance to U.S. economic and social welfare, universities face financial challenges threatening their capacity to continue making significant contributions to society. These financial challenges are exacerbated by the significant increase in the share of research costs universities now incur for federally funded grants. In the past 19 years, the allocation of these costs have become seriously imbalanced as reimbursement rates have stayed roughly the same while new federal regulatory requirements have been implemented and as personnel, energy and facility costs have increased.

During our discussions of F&A reimbursement rates, we identified several aspects of these costs most in need of examination with Federal policy makers. These elements are categorized in the following:

1. Defining components of the F&A rate
2. Setting the F&A rate
3. Using the F&A rate

These elements are further characterized into rough timeframes for action:

- Immediate (discussions already underway, or ought to be in the next several months);
- Mid-term (over the course of perhaps the next 6+ months and in the case of administrative costs charged to faculty, a demonstration project already underway); and
- Longer Term (for exploration and action probably not ready for at least a year).

We discussed two additional elements requiring action by universities apart from the federal agenda above:

4. Applying these principles to foundation and state research funding practices
5. Disconnecting the presentation of federal F&A reimbursements from the presentation of university investments in research.

Although this aspect was not discussed extensively at the regional meetings *per se*, the concerns about how F&A reimbursements are "spent" are tacitly in every consideration of the matter. Usually expressed as how difficult it is to explain to faculty and policymakers, we strongly believe we make the matter much more confusing by combining in one 'package' how F&A cost rates are derived with how the returns are allocated on campus in subsequent university investments.

Overall, these options are aligned with the proposals under development by AAU and COGR, but not every item will be a high priority on our joint agenda. As we work with AAU and COGR, we will determine which of these issues are most conducive to action and change by federal and other funders.

OPTIONS FOR REFORM

1. Defining components of the rate

Issue: In 1991, the federal government imposed a 26 percent cap on administrative expense reimbursement rates, which reflected about the average rate at the time. Today, COGR calculates the average administrative cost rates would be about 30 percent, driven in large part by increased regulatory compliance according to its survey and analysis. Thus the university subsidy of federally sponsored research has grown significantly.

Also in 1991, the direct charging of clerical and administrative expenses by Principal Investigators on grants was disallowed. Consequently, faculty have either had to rely more on a central administrative support within the 26 percent cap and/or handled their own administrative tasks. Indeed, a recent survey by the Federal Demonstration Project (FDP) noted that faculty administrative activities have increased dramatically.

Options:

Immediate action

- Eliminate the 26 percent Administrative cost cap, setting the rate for each university based on actually audited expenses;
  OR
- Raise the administrative cap to some higher rate, perhaps the present average of about 30 percent
  OR
- Retain or adjust the existing 26 percent administrative cap and define a new regulatory compliance add-on rate component of up to 5 percent, if justified by university expenses

Mid-term action (probably requiring some analysis/demonstration projects)

- Allow Principal Investigators to directly charge certain specific administrative costs to grants, to relieve the administrative burden of larger awards/research teams. (Note: if implemented broadly, this option might result in reducing the administrative cost

rate justified by a university, particularly if the present administrative cap stays in place.)

Longer term action (requiring further conceptual development, analysis and testing/demonstration)

- Explore the development of separate rate "modules" for the more regulatory intensive areas of research—e.g., biomedical research incurs more regulatory requirements due to human subjects, review of animal care and use, etc. Would it be a more targeted and efficient way to allocate costs to determine an administrative rate add-on tagged to the intensity of specific types of research in which a university engages—perhaps an added point or two? There would be many issues to explore, and several university research vice presidents have raised this intriguing proposal. (Note: this option also might result in reduction of the administrative cost rate justified by a university under some circumstances.)

2. Setting the Rate

Issue: F&A rates for individual institutions vary considerably based on their past rates and historic precision in claiming costs, region of the country, and cognizant federal audit agency. The present process is rife with inconsistency over time and lack of uniformity across agencies and institutions; to many observers F&A rate setting appears to be arbitrary.

Options:
Immediate action (to be phased in according to the rate-setting cycle for each institution)

- Set university F&A rates based on auditable costs at each institution, not on arbitrary judgments based on legacy rates
- Ensure consistency across universities in determining rate components, such as including utility studies and patenting/licensing costs, etc., with all universities afforded the same opportunities,
- Ensure consistency in practice across agencies and regions of the country, in how rates are set for universities. Institutions blessed in history with a straightforward cognizant agency or regional office ought not to have a cost advantage over universities that have a cognizant agency with a different orientation to rate-setting

3. Using the rate

Issue: Various federal agencies have imposed an array of limitations or caps on F&A rates which challenge the supposed uniformity, consistency of practice, and cost averaging

Options:
Immediate action

- Eliminate lack of overall uniformity in agency rate implementation, especially considering arbitrarily and subjectively imposed caps such as those at the U.S. Department of Agriculture.

Mid-term action

- Revisit the justification for separate and lower rates for federal training and other education programs; recognize there may be factual justification for rates for a federal non-research oriented training program to be lower than for research intensive programs. The goal is consistent practice in charging F&A rates across federal agencies for similar activities and programs

4. Extending these principles and practices to foundation and state funders of research

Issue: Foundations and states often specify they will not pay research overhead or establish arbitrary research overhead rates. Given the seemingly arbitrary and inconsistent practices of the federal government in establishing F&A rates, this foundation/state practice is perhaps understandable. As an ameliorating practice, states and foundations sometimes permit including direct cost items that are not allowed to be directly charged in federal grants. This practice may result in compensating funding in some cases but it creates confusion and complication for researchers whose funding sources include federal, state and foundation sources and it creates expensive accounting practices to track these exceptions.

Option:

Endorse the position that all research funders should cover a more appropriate share of the cost of research. Communicate as a national association this position to foundations and states, and ask them to change their practices to conform. To the extent the federal government changes its F&A practices to recognize this principle, foundations and states would be asked to add university F&A rates to the direct charges in their grants. Encourage more consistent F&A payment practices across various research funders to help reduce administrative burdens associated with the current array of practices.

5. Disconnecting the presentation of federal F&A reimbursements from the presentation of university investments in research?

Problem: Policymakers and others often equate how universities spend indirect cost returns with federal policies for deriving F&A rates. The university community causes this confusion by explicitly linking these federal reimbursements with university formulas for investment or "payback." The intense and growing damage of this connection is twofold:

- it suggests to faculty and policymakers that federal reimbursed funds are free money, or some form of "slush fund" inviting regulation over its use, and
- it takes attention away from how universities lose money on research—federal reimbursements do not cover the full research costs already incurred by universities.

While this confusing link has always lurked in the background and was not explicitly discussed at the A·P·L·U Regional Meetings, there is growing urgency to change this hard-to-explain and dangerous practice. The potential for significant harm grows as demonstrated in two recent examples:

- During Congressional consideration of a major research authorization bill, a floor amendment threatening to withhold F&A reimbursement from universities was partially justified by the suggestion that a particular segment of the university community does not receive its share of F&A reimbursement.

- During a recent talk, a senior official responsible for university rate-setting with the Office of Naval Research noted that universities are not transparent in how they spend their indirect cost returns, based on the variance in university allocation formulas from campus to campus. Several university officers in attendance immediately challenged the notion explaining it is immaterial how universities expended these funds as they are ***reimbursements*** for research costs already incurred. Although the ONR official willingly recanted and agreed that how the universities spend these funds is not germane to the determination of cost rates or return, the suggestion remained that at least some at ONR questioned subsequent university expenditures of F&A reimbursements.

By presenting two formulas—one to establish the F&A rates and another to determine how to distribute the "returns," do we in the university community sow this confusion? Do our various constituents believe that the latter formula—on distributing the funds after they are reimbursed—really drives the process? In allowing the focus to be on the payout rather than the initial incursion, we undercut how much universities are increasingly subsidizing research.

Option, for potential conceptual development and demonstration:
Is it possible for universities to present these two funding flows as two entirely separate activities? This is not to suggest universities change their accounting practices, but instead change their presentation to show:

- **F&A costs by source** - How much is allocated to federally funded research, how much the university would have received if full rates were allowed, and how much the university actually received from federal reimbursements—thus indicating the increased university subsidy of federally funded research. The reimbursements would be shown as going back into the university general funds, and/or back to the activities for which they were incurred. Consistency would require every university report in the National Science Foundation (NSF) expenditures survey the amount of its own funds spent to support research; this is now an optional reporting item.

- **University investments in research decoupled and apart from F&A reimbursement** - Present university research-related expenditures/investments for the types of activities presently attributed to indirect costs reimbursements—research start-ups, new laboratories, departmental/college funding, etc. Perhaps indicate these funds as coming from a specifically named category of university funds, perhaps

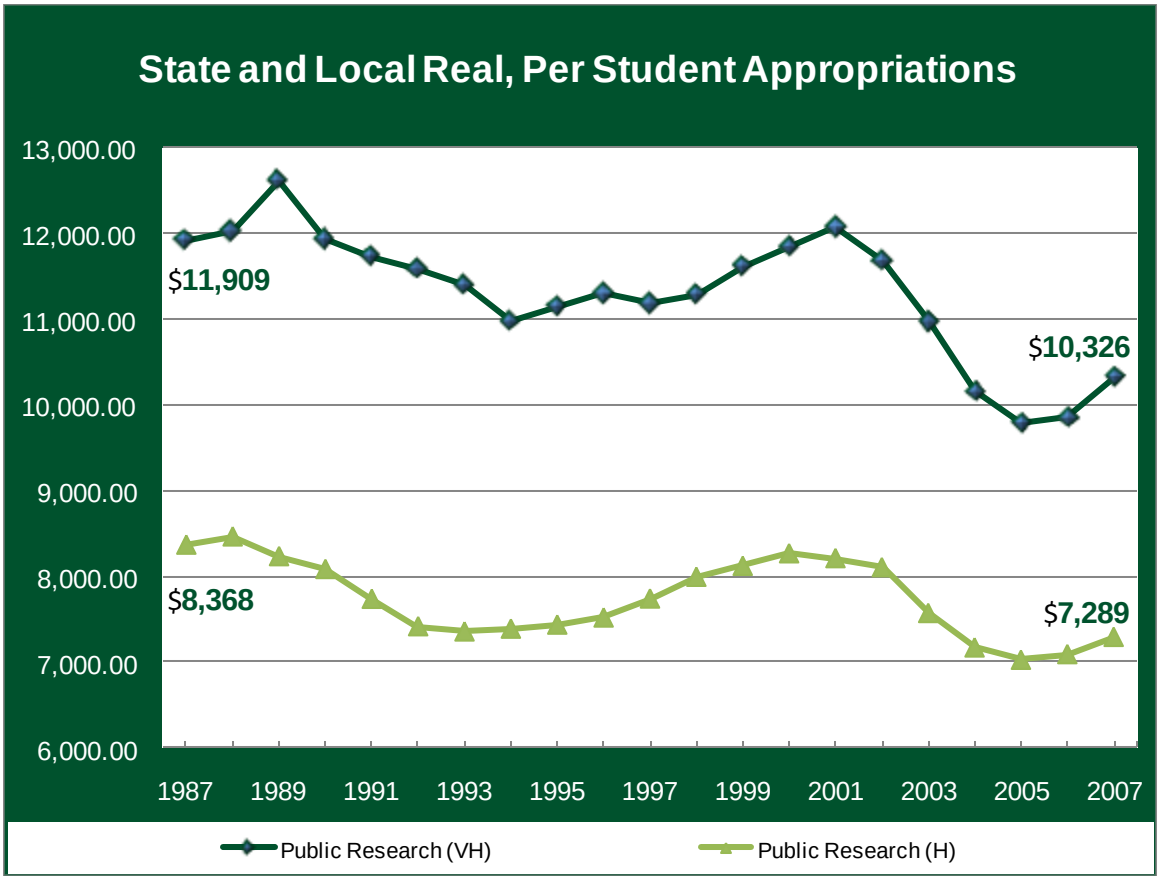
keyed to a university's overall research expenditure in a prior year, *but not explicitly keyed or sourced* to F&A cost return.

(Note: We recognize this option could become complicated as a portion of this university investment is indeed keyed to the amount of university F&A return, and at least at some universities, does reimburse activities for at least some of the costs incurred.)

FEDERAL SUPPLEMENTAL FUNDING

The long-term decline in real state funding per student at high and very high public research universities has made it increasingly difficult for universities to appropriately fund an array of teaching and research programs. While damage to these core functions of the research university may not yet be visible to the casual observer, it is clear to public research university presidents that the ability to carry out their research university missions has been undermined with increasing severity.

The 20-year (1987-2007) decline in real per student appropriations by the states for research institutions has been severe: 11.8 percent for Carnegie classified "very high" public research universities and 12.7 percent for "high." Added to this decline unfortunately are the financial reversals occasioned by the current recession, perhaps on average, 10 percent, but ranging upwards beyond 25 percent in some states.



These declines have forced public research universities to focus their remaining state resources on a steadily reducing number of programs. Basic support for instructional programs, teaching and research infrastructure, and faculty, graduate and research assistants and staff has suffered.

> "We could see 50 different independent decisions made in 50 different states and the result would be a national tragedy!"
>
> *Mark A. Emmert*
> *President*
> *University of Washington*
> *April 26, 2010*

The remaining funding, originating in state appropriations, is increasingly focused on large enrollment undergraduate programs and applied research programs that connect directly to state economic development agendas. Unfortunately, many of the expenditure items universities have had to cut are essential elements that contributed to the richer experiences of the undergraduate curricula of the research university. Furthermore, graduate education is poorer for these losses and the capability of research universities to carry out the complex research required by our national competitiveness agenda is undermined. During the A·P·L·U Regional Meetings senior leadership specifically considered whether federal support for a portion of these needs might be justified.

To some degree, the decline in state appropriations is a result of each state setting priorities independently of other states, but perhaps, with the subconscious, implicit assumption that other states will continue to fund basic infrastructure. Of these phenomena, Mark A. Emmert, then president of the University of Washington, observed at the A·P·L·U Western Regional Meeting: "We could see 50 different independent decisions made in 50 different states and the result would be a national tragedy!"

Unless this disinvestment is halted and then reversed, the resulting decline in public research universities and the contributions they make to the nation's competitiveness is inevitable. Daniel M. Fogel, president of the University of Vermont, spoke for his colleagues during the A·P·L·U Northeastern Regional Meeting: "We are haunted by the specter that our enterprise [the American research university] has seen its best days…"

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>
> *Daniel M. Fogel*
> *President*
> *University of Vermont*
> *April 30, 2010*

At each Regional Meeting, a consensus developed that every effort must be made to redouble efforts to align research universities with critical state needs in order to make clear to states that further cuts to state appropriations for operating as well as capital expenditures will cause severe damage. Furthermore, the general consensus was that additional federal support is critically needed as state support is unlikely to return soon enough or in sufficient quantity to forestall permanent damage.

While different priorities emerged from region to region and university to university, there was agreement that federal funding is needed to help maintain critical research university capacity and that we must pursue this additional federal support. While priorities for the programmatic form that support should take varied, there was common agreement that federal funding targeted to any high need area would benefit most research universities. This type of funding would simultaneously directly benefit that area while permitting reallocation of institutional funds to other areas of need.

On the following pages are three models for federal supplemental funding that were proposed and discussed at one or more of the meetings. The three models are targeted to different areas of need, but because funding is fungible, establishing just one of the programs will likely free institutional funds to use for other needs.

The funding level required for each model is justified, but each of the programs could be scaled up or down in size as is required. Similarly, each program could be modified to include state, foundation or donor matching if such funding held a realistic prospect of leveraging federal funds. There was little support evident for matching federal funding with university funds as such requirements result in shifting funds from one area of need to another rather than in a growth of overall capacity for teaching or research. It is growth in total capacity that is needed, and needed now.

SUPPLEMENTAL MODEL I: THE U.S. CHAIRS PROGRAM

The hiring and/or retention of distinguished faculty members in areas of national need is the first approach. The program described is modeled after the Canada Research Chairs program started in 2000.

Program description
The program would help to attract and retain distinguished faculty to research universities and enable them to achieve research excellence in engineering, the natural sciences, health sciences, humanities, and social sciences. Their presence improves depth of knowledge and quality of life, strengthens international competitiveness, and helps educate and train the next generation of highly skilled people.

Program scale
Support up to 18,000 U.S. Chairs. The Canada Chairs program presently includes 2,000 chairs; increased by the ratio of U.S. population (309 million) to Canadian population (34 million) yields the target number of 18,000 chairs.

Costs
The Canada Chairs program supports Type I and Type II chairs, with the former reserved for "outstanding researchers acknowledged by their peers as world leaders in their fields"

and the latter for "exceptional emerging researchers, acknowledged by their peers as having the potential to lead in their field." Type I chairs are funded for seven years at $200,000 per year and are renewable, while Type II are funded for a single five year term at $100,000 annually. Universities are alternately awarded Type I and Type II chairs so equal numbers of each type would be awarded initially. Cost: $2.7 billion annually.

Distribution
If the Canadian method is followed, 94 percent of the chairs would be awarded to universities in proportion to the dollar amount of research awards received during a three-year base period from federal research funding agencies. The remaining 6 percent of the chairs are awarded to universities that received some, but no more than 1 percent, of funding from federal research agencies over the three-year base period.

SUPPLEMENTAL FUNDING MODEL II: COMPETES DOCTORAL TRAINEE PROGRAM

Intended to expand support for doctoral students in key areas of national need, the program described generally follows the structure of the Competes Doctoral Trainee Program proposed by the Council of Graduate Schools in the 2010 monograph: *The Path Forward: Improving Graduate Education in the United States.*

Program description
The program would support training doctoral students in key areas associated with national need identified by the federal government. The major investment needed "to maintain U.S. leadership in the 21st century global economy [is] ... to develop the U.S. domestic talent pool by increasing investments in ... graduate education." Eighty percent of the traineeships would go to U.S. citizens while 20 percent would go to international students to ensure "U.S. graduate schools continue to attract the best and brightest students from around the world."

Program scale
The program would begin with 25,000 fellowships in FY2011 and ramp up to 125,000 students in FY2016 with each Fellow eligible for five years of support.

Cost
Each doctoral trainee would receive a stipend, tuition and fees, other costs of education, and ancillary fringe costs, for a total program cost of $80,000 per student, per year. Costs: $2 billion in FY2011 ramping up to $10 billion in FY2016.

Distribution
Graduate programs would apply for funding to support doctoral students in key areas. Those submitting proposals would be required to provide data, including enrollments, completion rates, and job placement information.

SUPPLEMENTAL FUNDING MODEL III: RESEARCH CAPACITY OF NATIONAL SIGNIFICANCE (RCNS)

Providing additional flexible funding for universities to maintain their research capacity in areas of national significance is the intention of this approach. The funding might be used for research equipment, maintenance of research facilities, acquisition of library materials, support of graduate students, retention of key research faculty, start-up costs for new faculty, payment of construction bonds for new or renovated facilities, seed funding for new research endeavors, etc.

Program description
RCNS funding would be provided directly to universities with senior administrators determining where to spend the funds in order to best maintain the programs/facilities that contribute to research capacity of national significance.

Program scale
There is no accepted estimate of the support deficit in this area. The National Science Board estimates the proportion of NSF spending devoted to infrastructure needs to be increased an additional 6 percentage points to make up the deficit at NSF for expenditures on university facilities and equipment. Somewhat arbitrarily, using this figure, one would estimate the cost of this program at $1.8 billion per year (.06 x $30 billion in total federal academic science research funding). At 10 percent, the cost would be $3 billion per year.

Distribution
The funds would be distributed proportionally as research awards are made by the federal research funding agencies. This would require an additional 6 or 10 percent (or the agreed-upon proportion) for each agency's university research budget. Each research award would then carry a sum designated for RCNS that is calculated by multiplying the total award budget by the agreed-upon percentage.

CONCLUSIONS AND NEXT STEPS

Twenty years of reduced real per student funding and shifting by funders of facilities and administrative costs onto public research universities have taken a significant toll on these important institutions. While the research enterprise remains robust, some deterioration is evident and more is in the offing unless these practices are reversed. During five regional conferences across the nation in April 2010, public research university presidents, provosts and research officers gathered and considered the actions required to ensure public research universities remain vital in the future.

Clearly, the long-term decline in state funding must be arrested and funding restored. In this document, public universities affirm their commitment to continue their strong service to the states and nation. In addition, they commit to future action in eight specific priority areas to improve their alignment with state needs.

To renew the historic federal-university partnership, critical to future U.S. economic and technological competitiveness, public research universities seek a reaffirmation of the principle of shared costs—that the federal government should reimburse an appropriate portion of facilities and administrative costs that arise from research done on behalf of federal agencies. Policies and practices of federal research agencies must change to implement this principle. State governments and foundations should endorse the principle of appropriate reimbursement and change their practices as well.

Because the funding decline has been prolonged and sharply worsened by the recent recession, federal government supplemental funding of research universities should be considered. Three possible programs of supplemental funding have been discussed.

As is our practice, A·P·L·U continues to welcome comments and recommendations from our members. We also will work with colleagues at AAU, as the overlapping university memberships have concerns that generally complement one another. COGR has been the research academy's principal agency for considering matters related to research reimbursement practices, and A·P·L·U will work closely with COGR. All the while, a dialogue with the Administration and individual agencies will continue since they understand the contribution made by research universities and are often willing to make adjustments that serve to strengthen the institutions. The National Academies' study of the international competitiveness of our country's research universities is underway. A·P·L·U will work with that panel as it moves forward with this important study.

Over the coming months, A·P·L·U will work towards a set of outcomes that improve the health of the nation's research universities. A·P·L·U thanks the many university officials that participated in the meetings and subsequent discussions and honing of this paper. We also thank our colleagues at AAU and COGR for their valuable input to this process. A·P·L·U is especially grateful to the leaders of the five host institutions and their dedicated staffs for convening these meetings and their special contributions to this dialogue.