Federal Investment in Public University Infrastructure to Stimulate the Economy, Increase Bachelor’s Degree Attainment in the Workforce, and Enhance National Competitiveness

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A Call for Federal Investment in Public University Infrastructure

As an outcome of discussions with academic colleagues and fellow administrators from public universities throughout the United States, a strong consensus is emerging that any new federal economic stimulus package should include a “one-time only” investment of five percent of the federal economic stimulus package dedicated to the construction of public university infrastructure. Such a federal investment, in the range of $45 billion, in public university infrastructure would:

- Build public university buildings, facilities, and other physical plant to promote enhanced access to higher education, large-scale knowledge production, and baccalaureate degree production;

- Ensure that building construction can begin within 120 days of the appropriation of the investment by allocating the funds to states in “block grants” on the basis of population and authorizing state governors to administer the approval of projects and distribution of funds;

- Create hundreds of thousands of jobs that immediately stimulate the U.S. economy by funding only those projects that are already “shovel-ready”;  

- Jumpstart U.S. national productivity and global competitiveness;

- Develop and exploit the efficiencies of a federal-state partnership for educational access and national competitiveness that requires neither a new federal bureaucracy nor project-by-project approval of public university infrastructure projects.

While the federal government has been focusing its attention on stabilization investments in the financial sector and considering additional investments to stabilize selected manufacturing areas, we contend that it is ignoring one of the single greatest platforms for effecting short-term and long-term economic stabilization and growth: the nation’s public universities. As the federal government considers additional measures to stimulate the economy and put people to work in ways that will have lasting impact on national competitiveness, America’s public universities have the ability to deliver not only new knowledge infrastructure, but also conditions for the training of highly specialized new workers, increased access for underrepresented minority populations, and many other optimal outcomes across diverse arenas to enhance both our quality of life and standard of living. As former Secretary of Labor Robert Reich recently commented:

Our preoccupation with the immediate crisis of financial capital is causing us to overlook the bigger crisis in America’s human capital. While we commit hundreds of billions of taxpayer dollars to Wall Street, we’re slashing our outlays for public education.
Education is largely funded by state and local governments whose revenues are plummeting. As consumers cut back, state sales taxes are shrinking, and as home values decline local property taxes are taking a hit. Three-quarters of our states are facing budget crises.... Yet, the future competitiveness and standard of living of America depend on our peoples’ skills, their capacities to communicate and solve problems, and innovate—not their ability to borrow money. What’s more, human capital is rooted here, while financial capital moves around the globe at the speed of an electronic blip. Right now global capital markets are frozen, but the big money—mostly in Asia and the Middle East—will come back here eventually, bailout or no bailout. It’s our human capital that’s in short supply. And without adequate public funding, the supply will shrink further.¹

We are at an important and unique moment in American history when one of the worst economic crises faced by the American government and the American people intersects with a time of great hope for the future of our country and an opportunity to change or improve those elements of our national investment strategy.

**Economic Impact of Federal Investment in Public University Infrastructure**

Our success as a nation is contingent on the establishment and maintenance of an optimal infrastructure, including not only those elements that come most immediately to mind—roads, transit, electricity, drinking water, telecommunications—but also the educational infrastructure of the public universities that provide the primary platform from which the country provides access to baccalaureate degree education to an increasingly diverse American populace. Unlike many other infrastructure investments, however, putting dollars to work in constructing university infrastructure would provide both a short-term stimulus effect on our national economy as well as a long-term, strategic impact on our nation’s ability to compete in the international marketplace.

The short-term stimulus effect from an investment in public university infrastructure arises from the fact that public universities are among the entities that are best positioned to initiate construction projects quickly. In recent written testimony submitted to the U.S. Senate Budget Committee, Mark Zandi, chief economist and co-founder of Moody’s Economy.com, commented that temporary increases in government spending have an immediate effect on the economy and that “[i]ncreasing infrastructure spending would also greatly boost the economy, particularly in the current downturn.”² Public universities are uniquely positioned to benefit from such investment: these institutions regularly engage in comprehensive master planning, employ facilities and architectural personnel in-house, and designate sites and design buildings and facilities in anticipation of construction when funding becomes available. According to data

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¹ Robert Reich, “Where’s the Bailout for Human Capital?” Commentary on Marketplace on December 3, 2008 [http://marketplace.publicradio.org/display/web/2008/12/03/pm_reich_commentary/]

collected annually by the American School and University Magazine, 61 percent of colleges and universities are completing some form of construction project in 2007 and 73 percent are currently planning a construction project to be completed by 2010. According to economic impact analysis conducted by researchers at the W. P. Carey School of Business at Arizona State University, the proposed targeted investments would have significant direct and indirect national impacts on jobs and GDP (with multiplier impacts included).

Using the methodology for estimating the economic impact of the proposed federal investment in public university infrastructure discussed in Exhibit A, the accumulated short-term (immediate) economic impact of the $45 billion in projects will be:

- 1,902,495 jobs
- A total of $143.34 billion dollars in GDP

These projects will boost US GDP by about a full 1 percent during the construction phase alone.

The medium- to long-term impacts arising from an investment in public university infrastructure would be a direct result of the enhanced ability of public universities to accept, retain, and graduate students with baccalaureate degrees into the national economy. The impacts arising from such an investment would also stem from the new knowledge produced, new innovations created, and new opportunities unleashed for enhanced productivity within a knowledge economy. Within the teaching and research facilities that would be built with new federal investment in public university infrastructure, we will be educating and training students who in turn will become our nation’s future source of human capital for innovation and entrepreneurial activity.

Leveraging the Longstanding Relationship between the Federal Government and America’s Public Universities

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4 Estimates of economic impacts were made using IMPLAN, an input-output economic impact modeling system used widely by researchers throughout the United States. The specific model used was based on the 2007 IMPLAN economic database. Full SAM multipliers were used. The purpose of economic impact analysis is to trace the full impact, direct and indirect, of a spending event on jobs and incomes in an economy. The direct effects of this spending are the impacts on businesses that provide the goods or services purchased. Using an input-output model, economic impact analysis also estimates the indirect or so-called multiplier effects that arise when businesses purchase intermediate inputs from other businesses, when upstream workers spend a portion of their incomes in the economy, and when governments spend new tax revenues. Spending out of the income generated during the various stages of the economic impact process continues to circulate within the economy until it is dissipated through “leakages” in the form of savings or payments for goods and services from outside the domestic economy. From an unpublished report by Dennis Hoffman and John Hill, W. P. Carey School of Business, Arizona State University, December 2008.
There are today approximately 678 public four-year colleges and universities that offer baccalaureate-level higher education in the United States.\(^5\) Public universities are one of the primary sources of the knowledge and innovation that have driven the global economy and provided our nation with the standard of living that we have come to take for granted. These are the institutions that have produced leaders in all sectors of academia, business, industry, and government. Through their role as catalysts in the advancement of knowledge, creativity, and innovation, these institutions have woven the fabric of our economic prosperity. Our public universities have educated millions, developed products and processes that have allowed us to lead the world in innovation, and exerted a direct and measurable impact on the communities and regions that they serve.

Our nation’s public universities are complex and multifaceted institutions of remarkable scale and impact: more than seven million students are enrolled in public four-year universities.\(^6\) These institutions are deeply committed to enhancing educational access and demonstrate robust capabilities to serve as a critical national asset in reinvigorating the competitiveness and growth of the American economy. With millions of students, tens of thousands of academic programs and ongoing research initiatives, and outreach that touches countless communities in both rural and urban America, the great public universities can produce the people, ideas, tools, solutions, and knowledge infrastructure at the scale our economy needs to regain its momentum and to set a new and successful trajectory for the future.

The proposed investment in higher education infrastructure is to be construed within the context of the longstanding relationship between the federal government and our nation’s universities. While the relative lack of centralized national administration and regulation of higher education inherent in the American system from its inception stands in marked contrast to most other nations of the world, what has been described as the “compact” between the federal government and our universities nevertheless ensures an enduring and productive symbiotic relationship.\(^7\) Federal support to fund

\(^7\) The decentralized American system has led to the establishment of a plurality of institutional types, i.e., a number and variety of public and private universities that perpetually engage in what has been described as a highly competitive “academic marketplace.” In this “marketplace,” universities compete for federal research dollars and private investment but also for the very best students, faculty, and administrators. Above all, competition is ongoing for the very best ideas. This fiercely competitive environment has encouraged innovation and risk-taking and led a number of ambitious universities to emerge as major research institutions. A basic overview of the concept is found in Hugh Davis Graham and Nancy
university research, particularly as an outcome of wartime research initiatives and the recommendations of the July 1945 report to the president, *Science – the Endless Frontier*, has made possible the ascendancy of America’s universities to international prominence. According to some scholars, the success of our universities is a direct consequence of federal patronage.8

Another notable episode came with the federal support for returning veterans of World War II provided by the Servicemen’s Readjustment Act of 1944, known as the G.I. Bill. But the precedent for federal investment in public universities had been consolidated beginning with the establishment of the land-grant universities as an outcome of the Morrill Act. The 1862 legislation included provisions for the distribution of federal land to fund the establishment of colleges and universities that would teach agriculture and the mechanical arts.9

While federal investment for university research has been a defining characteristic of the relationship between the federal government and higher education, the interrelationship has been crucial in other respects. Federal investment in higher education takes the form of federal financial aid programs, for example. But it has also been manifest in direct investment in the construction of academic infrastructure.10 In the present context it is imperative to underscore the recognition that federal investment in university infrastructure during periods of national economic difficulty is not without significant precedent. To the contrary, the Works Progress Administration (WPA), created by the Franklin Delano Roosevelt Administration and funded by Congress to address the economic downturn of that era, constructed much important academic infrastructure still in use today. If we allow the economic stimulus package to be directed to other sectors such as transportation infrastructure, for example, what we must recognize is


9 Alexandra Oleson and John Voss, eds., *Introduction to The Organization of Knowledge in Modern America, 1860–1920* (Baltimore: Johns Hopkins University Press, 1979), xii

10 Federal dollar funding to universities, in addition to funding the direct costs of a project such as salaries and laboratory equipment, provides universities with facilities and administrative (F&A) costs, sometimes referred to as “indirect” or “overhead” costs. These constitute significant reimbursements—in some cases as much as half of total award dollars—for the construction and maintenance of necessary research facilities, even when not directly associated with the given project. Recovered overhead costs can be directed to discretionary funding to support research in disciplines not associated with the initial project. Beyond covering the costs of sponsored projects administration and accounting, and operations and maintenance, overhead dollars provide funding for research facilities, start-up funds for faculty, support for graduate students, and the acquisition of library materials. In this context see Donna Fossum, et al., *Discovery and Innovation: Federal Research and Development Activities in the United States* (Santa Monica: RAND, 2000).
that neglect of investment in university infrastructure represents significant lost opportunity costs to our entire society.

Congressional recognition that federal investment for the construction of university infrastructure is appropriate and necessary is to be found in a report commissioned by the U.S. Congress. Among the policy recommendations of the National Academies Committee on Prospering in the Global Economy of the Twenty-First Century is a strong recommendation for the federal government to invest in university infrastructure:

Action B-3: Advanced Research Instrumentation and Facilities

The federal government should establish a National Coordination Office for Advanced Research Instrumentation and Facilities to manage a fund of $500 million per year over the next five years—ideally through reallocation of existing funds, but if necessary via new funds—for construction and maintenance of research facilities, including instrumentation, supplies, and other physical resources researchers need. Universities and the government’s laboratories would compete annually for the funds.\textsuperscript{11}

**Implications for the American Economy**

We can try to slow globalization, but we can’t stop it…. If we act boldly, then our economy will be less vulnerable to economic disruption, our trade balance will improve, the pace of U.S. technological innovation will accelerate, and the American worker will be in a stronger position to adapt to the global economy. -- Barack Obama, *The Audacity of Hope*

Calls for federal investment in American higher education come with increasing frequency. On December 3, 2008, Microsoft founder Bill Gates underscored the impact of public investment in academic research by recommending that the Obama Administration increase investments in the American higher education system to “spur technological advances to improve agriculture, prevent disease, and promote economic growth in the world’s poorest nations.”\textsuperscript{12}

In an assessment of the potential implications of a second economic stimulus program presented as testimony before the House Committee on Transportation and Infrastructure (June 10, 2008), Bernard L. Schwartz, retired chairman and CEO of Loral Space and Communications Ltd., and board member of the New America Foundation, made the following observations: “The stimulus package passed by Congress earlier this year was too focused on providing a short-term boost to consumption, and will be too small and too transitory to create a sustainable recovery given the size of the housing and credit bubble, and the role that the housing played in sustaining consumption levels


\textsuperscript{12} CNN, December 3, 2008 [http://m.cnn.com/cnn/politics/detail/207099/full;jsessionid=B6C92498A70783655015934E9F68F5.live4ib]
over the past decade.” According to Mr. Schwartz, a second stimulus program that is both more sustained in duration and “more focused on investment and creating new jobs” will be essential:

By making public infrastructure spending the centerpiece of a new economic recovery program, we would be able to accomplish several urgent public policy goals simultaneously. We would close the public infrastructure investment gap at a time of low borrowing costs; we would provide the economy a significant boost in investment and job creation that is needed to put the economy on a new growth path that is less dependent on housing and debt-financed consumption; and we would make the economy more productive and efficient over the longer term by eliminating costly bottlenecks and by crowding in new private investment. Public spending on infrastructure is the most effective way to counter an economic slowdown caused by the unwinding of a major asset bubble.

Mr. Schwartz points out that the second stimulus package presents the opportunity of “closing the public infrastructure deficit” through an increase in public infrastructure spending without an equivalent increase in the budget deficit, “since the deficit would widen in any case as tax revenues decline because of falling incomes for businesses.”

**Investing in the Future of America**

The relationship between the federal government and our public universities has been incalculably beneficial to American higher education, to the nation, and indeed, to our entire global society. Our public universities are the principal source of the higher education that is the means by which a skilled workforce is produced. These institutions are the source of new knowledge capital and thus economic growth and advances in society, for the benefit of both the individual and the collective. The global economy requires skilled workers, and the wage gap between those with education and skills and those without continues to widen. More and more knowledge inputs are increasingly required to perform almost any job in the new global knowledge economy. The economic success of individuals contributes to the success of a society—in fact, it is the main driver. Without it, the United States and nations of Western Europe may face a reduction in our quality of life in the next generation, something unheard of in the past. As formulated by the Committee on Prospering in the Global Economy of the Twenty-First Century convened by the National Academies:

Without a renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position. For the first time in generations, the nation’s children could face poorer prospects than their parents and grandparents did. We owe our current prosperity, security, and good health to the investments of past generations, and we are obliged to renew those commitments in education, research, and innovation policies to ensure that the American people continue to benefit from the remarkable

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opportunities provided by the rapid development of the global economy and its not inconsiderable underpinning in science and technology.14

Federal investment in public university infrastructure would advance the production of new knowledge, drive new innovation, and unleash new opportunities to enhance both our productivity and competitiveness in the new global knowledge economy. Such investment in the American populace and our future generations would provide not only a significant return on investment but also implicit support for the mission of our public universities and their multiple impacts on many diverse constituencies. The potential of these outcomes presents a compelling case for the inclusion of federal investment in the construction of public university infrastructure in an Obama Administration economic stimulus package.

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14 Rising Above the Gathering Storm, 13. The issue of decline in our national standard of living as a consequence of lack of investment in educational infrastructure is addressed in this and a number of other recent reports.
The purpose of economic impact analysis is to trace the full impact, direct and indirect, of a spending event on jobs and incomes in an economy. The direct effects of this spending are the impacts on businesses that provide the goods or services purchased. Using an input-output model, economic impact analysis also estimates the indirect or so-called multiplier effects that arise when businesses purchase intermediate inputs from other businesses, when upstream workers spend a portion of their incomes in the economy and, depending on the model used, when governments spend new tax revenues. Spending out of the income generated during the various stages of the economic impact process continues to circulate within the economy until it is dissipated through “leakages” in the form of savings or payments for goods and services from outside the domestic economy.

Estimates of economic impacts were made using IMPLAN, an input-output model used widely by researchers throughout the United States. The specific model used was based on IMPLAN’s 2007 economic database. Full SAM multipliers were used.

The size and accuracy of economic impacts estimated using an input-output model such as IMPLAN depend on three factors: (1) the accuracy with which interindustry linkages are described, i.e., the upstream effects that arise when a business purchases parts, components and supplies from other businesses; (2) estimates of the extent to which spending during the economic impact process falls on goods and services produced outside of the domestic economy; and (3) assumptions made about the extent to which income generated during the economic impact process is spent again, or “re-cycled.”

(1) To obtain the greatest accuracy in estimating economic impacts, it is necessary to have a detailed description of the precise nature of the goods and services that are outsourced by the businesses on which spending first falls. This kind of detail is often not available. One then must rely on default patterns available in the input-output model, patterns which are estimated from national survey data and which apply to an aggregated industry group. IMPLAN offers a fine level of detail in its industry sectors – over 400 individual sectors. Nevertheless, there is some level of aggregation. For example, in the area of new construction, there are only four sectors: residential, nonresidential commercial and health care facilities, nonresidential manufacturing, and other nonresidential. As another example, all private establishments that provide scientific research and development services, regardless of their field or specialty, are lumped into one category.

(2) A basic element of any input-output analysis involves removing from the multiplier process leakages from spending that falls on goods and services produced outside of the
domestic economy. The size and accuracy of overall impacts then depend critically on how large and well-estimated import leakages are. This is much more of an issue for state or county-level studies than for national studies. Leakages at the national level are imports from other countries which can be well estimated with international trade data. Leakages at the state or local level, on the other hand, may involve purchases from other states or counties. Data on trade flows at the sub-national level are not available and must be estimated. IMPLAN offers several alternative ways to estimate these flows, including estimates from econometric equations contained within IMPLAN and estimates based on location quotients.

(3) An important modeling assumption that must be made concerns the extent to which income generated in the economic impact process is re-cycled or spent again. Most economic impact studies assume that households receiving labor income during the economic impact process spend a fraction of that income on consumer goods and services, some of which, of course, are produced outside of the domestic economy. Some models also estimate government tax revenues that are generated during the economic impact process and allow for those new revenues to be spent by governments. It is also possible to estimate the extent to which capital depreciates during production and allow for purchases of new capital to replace that which depreciated. IMPLAN allows the researcher to choose which elements of this re-cycled spending he wants to incorporate in the multiplier process. The estimates of economic impacts reported here are based on what is known as the “full SAM” model. This model provides for each of the above types of re-cycled spending patterns.

(4) IMPLAN analysis is project specific, not time specific. So if the direct spending takes place over a year and are ongoing annually then the results may be interpreted as ongoing annually. If they are “one time” expenditures, then the results will accrue one time, in close proximity in time to the dates of the direct expenditures.