

AAU Association of American Universities
APLU Association of Public and Land-grant Universities
ACE American Council on Education
AUTM Association of University Technology Managers
AAMC Association of American Medical Colleges
COGR Council on Governmental Relations

MEMORANDUM

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TO: Office of Science and Technology Policy

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On behalf of the research universities, affiliated research institutions, medical colleges, and the higher education community represented by our associations, we appreciate the opportunity to respond to the Office of Science and Technology Policy (OSTP) and National Economic Council, Notice of Request for Information (RFI) on the Administration's Strategy for American Innovation. Recognizing that innovation is a leading driver of economic and national security, we commend the Administration for continuing to advance and revise a Strategy on American Innovation. We also believe it is important to outline a macro strategy to help unite the efforts of the federal government, states, industry, and academia.

We support the Administration's Innovation Strategy and recognize the critical role of university research in the strategy. We share the goal of facilitating the commercialization of research performed at our universities to promote innovation and entrepreneurship. We appreciate the ongoing dialogue that we have had with the OSTP officials about these matters, and view the RFI as another step in the process.

Our associations previously submitted comments, as invited by the Department of Commerce, for the RFI on the Strategy for American Innovation in May 2010. We highlighted the importance of maintaining the Bayh-Dole Act; the challenges and barriers to commercialization, including finding resources to support commercialization by universities; our support for Administration initiatives underway; and additional specific policy and funding recommendations such as modifying the research and development tax credit and providing supplemental grants to support the translation of research with a high potential for commercialization. We are pleased to see the Administration incorporate some of the suggestions from our response in May 2010, and again are submitting comments to help address issues and questions raised in the RFI.

Our collective response to selected questions posed in the RFI is included in the attached.

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Joint Response to OSTP RFI for Strategy for American Innovation

Overarching Questions

- 1) *What specific policies or initiatives should the Administration consider prioritizing in the next version of the Strategy for American Innovation?***
- 2) *What are the biggest challenges to, and opportunities for, innovation in the United States?***
- 3) *What specific actions can the Federal Government take to build and sustain U.S. strengths?***
- 4) *How can the Federal Government augment its overall capacity for analysis of both the forces that determine the competitiveness of specific sectors and the impact of Federal policies?***
- 5) *What innovation practices and policies have other countries adopted that deserve further consideration in the United States?***

The top priority for the next version of the American Innovation Strategy should be increasing the productivity of our national science and technology enterprise, including basic research conducted at universities. Innovation relies heavily on well-educated and trained people who are scientists, engineers, entrepreneurs, educators, creative thinkers, and leaders in universities, industry, and government, and leaders in their laboratories. This is critical if the United States is to compete successfully, prosper, and ensure its economic and national security in the 21st century. To meet that commitment, the Federal Government must set and meet investment targets that provide for steady and sustained real growth in funding for all of the major Federal research agencies that support basic research, including: NIH, NSF, the Departments of Agriculture, Defense and Energy, NASA, NIST, and NOAA.

Our many member organizations favor thinking positively and expansively about a research ecosystem that lends itself more easily to innovation. Unfortunately, the nation's ability to make sound and sustained investments in fundamental research has been hampered by sequestration and unrealistic caps on discretionary spending imposed by the Budget Control Act (BCA). Indeed, we view sequestration as the greatest threat to future U.S. innovation. As recently noted by the American Academy of Arts and Sciences, "there is a deficit between what America is investing and what it should be investing to remain competitive, not only in research but in innovation and job creation."¹ This growing "innovation deficit" undermines future U.S.

¹ American Academy of Arts and Sciences, 2014. *Restoring the Foundation: The Vital Role of Research in Preserving the American Dream*, p. 12.

economic growth and harms our nation's overall fiscal health, worsening long-term budget deficits and debt.

While federal research funding has stagnated due to our dysfunctional budget process, countries such as China, South Korea, and Singapore are far outpacing the U.S. in their annual percentage growth of research and development funding. And as nations around the world aggressively seek to prepare their citizens to take on the global workforce challenges of the 21st century, our nation is falling behind. To maintain our competitive edge, the U.S. must invest in research and offer access to higher education to all who seek it.²

Innovation Trends

6) How has the nature of the innovation process itself changed in recent years and what new models for science and technology investment and innovation policy, if any, do these changes require?

The view that innovation occurs in a linear fashion—basic research leads to applied research, which leads to development—has always been overly simplistic and is no longer viewed as the model upon which U.S. science and innovation policy should be based. The innovation process is much more dynamic and interactive. New fundamental research needs are often driven and informed by later stages of research and development (the same bi-directional feedback is also true in medical research, as advances in clinical and population health research often contribute to discoveries in fundamental biomedical research). New government mechanisms are needed to encourage, incent and support university-industry collaborations. Programs such as the National Network for Manufacturing Innovation (NNMI) and the Semiconductor Technology Advanced Research network (STARnet) are important models that the administration should expand and try to replicate in other industrial sectors.

Unfortunately, there are some instances where recently implemented agency policies have increased administrative burdens on institutions and faculty without a proven commensurate benefit to the public or to the research enterprise. Such rules could discourage productive university-industry collaboration. One example is the Public Health Service's (PHS) financial conflict of interest (FCOI) rule. These regulations, which expanded previous rules in place since 1995, imposed new obligations on institutions and lowered the threshold for financial interests that must be disclosed to institutions by investigators. In response to these new requirements, institutions have made substantial modifications to their conflict of interest policies and processes. By increasing the amount of information reviewed by institutions, as opposed to focusing upon if and how universities are actually managing these conflicts to ensure the promotion of ethical and principled partnerships, the FCOI rule has added to faculty burden and cost universities significant resources to implement without knowing whether such increased burden would be justified by resulting in any noticeable increase in the number of problematic FCOI cases avoided or properly managed. We would encourage the Administration to closely reexamine the PHS FCOI rule to evaluate and assess both its effectiveness, costs and adverse

² See: <http://www.innovationdeficit.org/>.

impacts on entrepreneurial activities as has already been suggested by the National Science Board in its March 2014 report titled *Reducing Investigators' Administrative Workload for Federally Funded Research*.³ We note that the AAMC is engaged in a 4-year data collection project to assess the financial impact of this specific regulation and has been in discussions with NIH about how this data could be useful to the PHS in conducting this type of review.⁴

It is also worth noting that industries' willingness to make investments in basic and applied research has been declining. More and more, industry R&D money is devoted to development work. The result is increasing pressure on university and Federal laboratories to undertake more applied research. Venture capitalists have also decreased their investments in high risk research. The government will have to promote policies and new funding mechanisms that support expanded fundamental research at universities, Federal laboratories, and private non-profit research institutes to fill the void.

8) *What are important needs or opportunities for institutional innovation and what steps can the Federal Government take to support these innovations?*

So that new ideas and technologies developed with Federal research funding can be translated into the marketplace and for public good, the Federal Government must work with universities, federal laboratories and non-profit research organizations to develop and support new and innovative translational research, technology transfer, and commercialization programs. While there has been significant interest in increasing such activities at universities, one of the major challenges is that funds often do not exist to support such activities. That said, we see innovative new Federal programs such as Innovation Corps (I-Corps), the i6 Challenge and the NIH Research Evaluation and Commercialization Hub (REACH) program as positive developments in this area. NIH and NSF should also be commended for their recent collaboration on I-Corps, and the NIH's willingness to base such a program, with credit, on the experience of a sister agency; the willingness of agencies to collaborate and learn from each other is in itself a valuable response to funding constraints. We would encourage further exploration of how Federal agency programs like these can help in accelerating innovation and technology transfer. In particular, proof of concept funding programs, as discussed further below (item #15), have the potential to vastly accelerate innovation and commercialization.

³ National Science Board, 2014. *Reducing Investigator's Administrative Workload for Federally Funded Research*, pp. 14-15. Available online: <http://www.nsf.gov/pubs/2014/nsb1418/nsb1418.pdf>.

⁴ For more information, see: <https://www.aamc.org/metricsproject>.

Science, Technology, and R&D Priorities

10) Where are there gaps in the Federal Government's science, technology, and innovation portfolios with respect to important national challenges and what are the appropriate investment and R&D models through which these gaps might be addressed?

While our associations do not emphasize any specific gaps in current funding for science and technology, we believe it is timely to reiterate the vital role that the social and behavioral sciences – anthropology, economics, political science, psychology, linguistics, sociology, among others – combined with advances in other areas of science will play in addressing the nation's most pressing challenges in areas such as national security, education, commerce, health, energy, crime and public safety, and transportation. We are concerned about actions indicating that some in Congress seek to relegate such research to a second-class status in federal research funding by imposing restrictions on it, or worse, barring federal funding of such research entirely. With this in mind, we encourage the Administration to continue to support these important fields of scientific research and to recognize the critical role that they must play if the Administration's National Innovation Strategy is to be successful.

11) Given recent evidence of the irreproducibility of a surprising number of published scientific findings, how can the Federal Government leverage its role as a significant funder of scientific research to most effectively address the problem?

The science community, including NIH, NSF, and other funding agencies, is intensely focused on gauging the extent of this problem and developing measures to improve the reproducibility, quality, and reliability of experimental findings. The NIH has initiated a review at its highest level, and among other actions, convened a working group of scientific publishers who have agreed to take further responsibility for the reproducibility of findings published in their respective journals. The NIH has made significant progress in analyzing the problem, at least in the biomedical sciences. The NIH has concluded that the most problematic results lie with preclinical studies, particularly with animals, and much less with human subjects research, where experimental designs and procedures are more amply documented and reviewed. This conclusion resonates with the widely publicized concerns of the pharmaceutical industry. Problems also arise from the increasing sophistication and complexity of science, including the sensitivity of instrumentation, reliance on highly refined or specialized resources, such as genetically engineered animal models, and on new and variable capabilities in computer modeling, statistical analyses, and programming.

We believe the Federal Government currently has the complement of tools and policies to address these concerns effectively. These include a strong peer review and oversight apparatus at all key funding agencies, a broad diversity among institutions and scientists performing research, extensive training programs, and an ethos promoting independent inquiry and competition. In recent years, policies have also been strengthened to promote sharing of data within the scientific community, public access to published results of Federally sponsored research, and expedited translation of results into commercial application (a process in which findings are also rigorously examined). The community is also developing best practices for documenting the statistical and other programs used in analyzing complex datasets. We believe that we can strengthen the

reliability and quality of research findings by further strengthening these processes, and by targeted efforts on areas, like enhanced training or review of research design in preclinical trials. Our associations are concerned that major regulation or legislation to address reproducibility would further stress the enterprise, while not being as effective in tailoring reforms to variations among disciplines or modes of research.

Skilled Workforce Development

12) What novel mechanisms or models might facilitate matching skilled STEM workers with employers and helping individuals identify what additional skills they may need to transition successfully to new roles?

The best mechanism for matching skilled STEM workers to employers is effective partnerships between universities and industry. New approaches to such partnerships are emerging and attracting the attention of business and higher education leaders alike. The Business-Higher Education Forum, for example, is working with the Association of Public and Land-grant Universities (APLU) and others to foster the development of strategic relationships between university and industry partners in a number of regions across the U.S., each partnership focused on a critical area of STEM workforce needs, such as cybersecurity, data analytics, or financial services. These partnerships are established based on clear and reliable labor market needs analyses. A complete, evidence-based understanding of labor market needs is an important starting point.

Universities and industry partners must go beyond such needs analyses, however, to design the most appropriate programs to engage students in learning about and connecting to career opportunities. While curricular approaches are often appropriate, some areas of STEM skills development are so rapidly changing that it is difficult to design curriculum to meet these needs. Universities—working in partnership with industry—can and should develop, design, and implement new kinds of agile programs to complement credit-bearing curricula.

The development of non-STEM-specific skills and capabilities is important to the success of STEM graduates in the labor force. University-industry partnerships must recognize the importance of creativity and innovation, critical thinking, communication, problem-solving and other “21st century skills”—and the link between these skills and non-STEM curriculum in the arts, humanities, and social sciences. Professional Science Master’s (PSM) degree programs, currently being developed and implemented by many of our member institutions, are one example of an approach that includes both STEM curriculum and development of workplace skills. The service professions, for example in health care, social work, and environmental science, are similarly developing innovative educational degree programs and curricula amplifying on STEM skills and content.

14) What mechanisms or programs can effectively increase the supply of workers with technical training, from industry-recognized credentials and postsecondary certificates to two- and four-year degrees?

Community colleges are employing a number of approaches to supply industry with technically skilled workers. Many colleges are creating stackable credentials, which award students with industry-valued certificates on the way to earning a degree. This approach is central to career pathways, which provide workers with a structured sequence of courses and services that allow them to move seamlessly between work and further education and training, which is essential in rapidly evolving technical fields. Community colleges are working with businesses and industry associations to incorporate industry certifications directly into curricula, so that successful students will earn both a credential from their institution and one or more certifications during the course of their studies.

Many of these approaches are featured in the new Workforce Innovation and Opportunity Act, which reauthorizes several of the key Federal job training programs. For the last decade, the Federal Government has directly supported the expansion of innovative job training programs at community colleges, first through the Community-Based Job Training Grants and subsequently through the Trade Adjustment Assistance Community College to Career Training (TAACCCT) grants. 2014 marks the final year of the TAACCCT grant program. Continued, dedicated support for community college workforce development programs, as proposed by the administration in the Community College to Career Fund, is vital to producing skilled workers. The Carl D. Perkins Career and Technical Education Act also remains a vital source of support for these programs.

Congress and the administration should continue to explore ways to modify the student aid programs so that they are not impediments to providing workers with the training they need. Competency-based programs, shorter-term certificate programs, and aid for current baccalaureate degree holders seeking additional training are some of the areas where targeted innovations would likely yield positive results. It would also be beneficial to increase focus on quantitative and scientific literacy, plus the basic skills businesses say they need that can be enhanced in academic programs: communication skills, problem solving, and teamwork. Promoting defined career ladders in emerging technologies with outreach to middle and high schools would supplement the outreach made for the STEM fields. Expansion of the apprenticeship model to more industries, and support for internships allowing practical experience, would also be mechanisms to increase the supply of qualified workers, ready to produce from day one.

Manufacturing and Entrepreneurship

15) What new or existing investment models should be explored to support entrepreneurship in new geographies, as well as in technologies and sectors that are capital-intensive, relatively high-risk and require sustained investment over long periods of time?

Public policy and public expectations have increasingly emphasized the need to move university basic research discoveries into the commercial marketplace. Bridging this gap, often referred to as the “valley of death,” is a critical need. To tackle this problem, Federal research agencies have focused on developing new translational research programs. While such programs can play a supporting role in transferring research into the marketplace, effective tech transfer and commercialization require more than translational research. A central barrier to effective transfer and commercialization is the fact that researchers and universities do not have resources available to support the proof of concept work, market analysis, and mentoring needed to translate these ideas from the university laboratory into commercial products.

Our associations encourage the administration to support the creation of a new multi-agency program focused on funding earlier stage proof of concept research across research agencies and scientific disciplines. One might think of such a program as a SBIR “phase zero” program. A program like this would help more projects cross the “valley of death,” and also aid in enhancing the infrastructure (e.g., expertise, personnel) and facilitating the cultural change necessary for universities to better support this kind of transfer. The NIH has recently developed the Research Evaluation and Commercialization Hub (REACH, noted above) program to address this need. We are hopeful that this program model can be expanded at NIH and adopted by other federal research agencies in the future. Another non-federal program we would point towards as a successful model is the Wallace H. Coulter Foundation Translational Research Partnerships awards in Biomedical Engineering.⁵

18) What investments, strategies, or technological advancements, across both the public and private sectors, are needed to rebuild the U.S. “industrial commons” and ensure the latest technologies can be produced here?

A number of promising initiatives for rebuilding the U.S. industrial commons are already underway. The Administration’s vision for a set of regional manufacturing innovation institutes holds the promise to help close the divide between research and commercial application of advanced manufacturing technologies by bringing researchers and industry personnel together at these institutes. The Revitalize American Manufacturing Innovation (RAMI) Act, currently being considered by the Congress, supports the establishment of the Administration’s proposal to create a national network for manufacturing innovation (NNMI). Approval and of this legislation and subsequent Congressional appropriations are critically important to scale NNMI to the level which has been proposed by the Administration. A piecemeal approach will not move quickly enough to ensure the rapid technological advancements necessary to sustain the competitiveness of the U.S. manufacturing industry.

⁵ See: www.whcf.org/partnership-award/overview.

It is important that the Administration continue to support the Hollings Manufacturing Extension Partnership as well. This program provides important technical assistance to manufacturers as they adapt to the new technologies and business models of advanced manufacturing. The program is important for small- and medium-sized manufacturers, which employ a significant portion of the American manufacturing workforce.

Regional Innovation Ecosystems

19) What partnerships or novel models for collaboration between the Federal Government and regions should the Administration consider in order to promote innovation and the development of regional innovation ecosystems?

The i6 Challenge from the Economic Development Administration (EDA) is a good example of how the Federal Government can foster regional innovation ecosystems. The program is modeled after successful university strategies—specifically the MIT Deshpande Center for Technological Innovation and the von Liebig Center at the University of California San Diego—that focus on proof of concept work as central to success in regional innovation and entrepreneurship. Other sections of this response address the critical need for support of proof of concept programs. Programs supported by i6 increase and deepen partnerships between institutions of higher education, industry partners, and economic developers, helping to establish the innovation networks that form the backbone of regional innovation ecosystems.

Universities and other higher education institutions frequently play a convening role for such networks. They bring core assets and innovation economy infrastructure—from labs to classrooms—and help to build connections between and among other innovation network nodes. One example of this dynamic comes in the form of what the National Governors Association has called “institutes for collaboration”—facilities that house assets from multiple universities and industry partners in the same physical space and have a catalytic effect on not only technology development but also stimulation of innovation networks. Examples of such institutes for collaboration include the Commonwealth Center for Advanced Manufacturing (C-CAM) in Virginia, Clemson University International Center for Automotive Research (CU-ICAR) in South Carolina, California Institute for Quantitative Biosciences (QB3) in California, and Oregon Nanosciences and Microtechnologies Institute (ONAMI) in Oregon. The Administration’s vision for manufacturing institutes is essentially an “institutes for collaboration” strategy, and this approach can and should be extended across industry sectors and beyond manufacturing.

20) How should the Federal Government promote the development of metropolitan “innovation districts,” where large research institutions, companies, start-ups, and business accelerators congregate to facilitate the knowledge flows that sustain innovation?

As described in the recent Brookings report, *The Rise of Innovation Districts*, regional innovation ecosystems are “synergistic relationship[s] between people, firms, and place (the physical geography of the district) that facilitates idea generation and commercialization.” The report further points out that while economic and physical assets are important, networking

assets are at least as critical, and that an important step in creating innovation districts is to build a collaborative leadership network. The Federal Government should consider policy models focused on fostering the leadership networks without which the other critical elements cannot and will not fall into place.

Policy models that support institutes for collaboration, as described above, could be central to innovation district strategies. Programs that require collaboration between universities and industry, and involvement of economic developers, could help. Policy strategies to promote innovation districts and measure their success should include the extent to which a network has been established and whether the network has undertaken new efforts. If policies focus only on the intended outputs and outcomes of such networks and do not also value the networks and interactions themselves as important inputs needed to reach intended outcomes, it will be difficult to achieve success in policy implementation.

Intellectual Property/Antitrust

21) What new challenges and opportunities for intellectual property and competition policy are posed by the increasing diversity of models of innovation?

New models of innovation will directly impact business transactions in the commercial sector. Universities will contribute substantially to some of these models, such as open innovation, through the production and dissemination of new knowledge. This university contribution will be enhanced by the ongoing implementation of the thoughtful OSTP public access policy promulgated in OSTP Director Holdren's February 22, 2013 memorandum.

As previously noted, a critical component of university contributions to the nation's innovative capacity is the continuation of a strong patent system. Since the passage of the Bayh-Dole Act in 1980, there has been a remarkable increase in patents and licenses resulting from university research in a wide range of fields. University associations agree that the current legal framework for university technology commercialization, as set forth by the Bayh-Dole Act of 1980 and implementing regulations, continues to be effective and needs to be maintained. Patents play a key role in the transfer of inventions resulting from university research into the marketplace for development

Unfortunately, in recent years, legitimate patent holders across the spectrum, including universities and their licensees, have been victimized by abusive practices that impair the ability of the U.S. patent system to foster innovation and economic competitiveness. We caution, however, that any proposals targeting abusive practices must be structured so that they curb abuses without undermining the ability of legitimate patent holders to enforce their patents and, by extension, diminishing the value of patents.

Another critical component of the U.S. patent system facilitating university contributions to the nation's innovative capacity has been an effective grace period. The grace period in effect prior to the enactment of the America Invents Act (AIA) supported the university mission of early, broad dissemination of research results, providing up to one year after the disclosure of an

invention to file for a patent on that invention. Unfortunately, the AIA grace period is fatally flawed, discouraging early disclosure of patentable discoveries. A statutory fix to the AIA grace period will encourage early, broad disclosure of research results, benefiting innovation in a manner comparable to OSTP's public access policy noted above.

Finally, the *Guidance Memorandum for Determining Subject Matter Eligibility of Claims Reciting or Involving Laws of Nature, Natural Phenomena, & Natural Products* http://www.uspto.gov/patents/law/exam/myriad-mayo_guidance.pdf issued by the Patent and Trademark Office (PTO) in March has led to serious concerns in the patent community about PTO's very broad interpretation of recent Supreme Court precedents. This could have a substantial adverse effect on innovation. We believe that far more public input and deliberation is necessary before the promulgation of final guidance that significantly reduces the ability to patent discoveries and inventions related to natural products.

Novel Governmental Tools For Promoting Innovation

22) What are specific areas where a greater capacity for experimentation in law, policy, and regulation at the Federal level is likely to have large benefits?

We urge the administration to closely consider how Federal regulations and reporting pertaining to the research can be streamlined, harmonized and in some instances, outright eliminated to improve the efficiency with which innovation occurs by reducing investigator administrative burden, decreasing costs yet still ensuring adequate accountability. AAU, COGR and APLU have recently worked together to develop a listing of major research regulations and reporting requirements that should be targeted for reform. Many of our recommendations are similar to those released in March of this year by the National Science Board.⁶ Even after two previous presidential orders calling for regulatory reforms, we have seen little action by the Administration to reform research related regulations. In fact, many would argue that the development of recent agency policies—such as the PHS FCOI—have further burdened the research enterprise by levying additional requirements and costs on both researchers and research institutions.⁷

We therefore call upon OSTP to establish an ongoing process for reviewing and assessing regulations that could be streamlined, harmonized or eliminated.

⁶ National Science Board, 2014. *Reducing Investigator's Administrative Workload for Federally Funded Research*. Available online: <http://www.nsf.gov/pubs/2014/nsb1418/nsb1418.pdf>

⁷ Smith, T. L., Trapani, J., DeCrappeo, A., & Kennedy, D., 2011. Reforming Regulation of Research Universities. *Issues in Science and Technology*, 27:4. Available online: <http://issues.org/27-4/smith-5/>
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23) *Beyond current Federal efforts to promote open data and open application programming interfaces (APIs), what other opportunities exist to open up access to Federal assets (such as data, tools, equipment, facilities, and intellectual property from Federally funded research) in order to spark private sector innovation?*

As noted in the response to question #21, the Administration's public access policy and new open innovation models will facilitate private sector innovation through greater access to Federal assets and the results of Federally funded research.

Another opportunity to facilitate greater access is to enhance the functionality and usability of Federal databases such as the invention data reported in the *i*-Edison system maintained by the National Institutes of Health. This database currently has limited access and searchability, and the reporting requirement tends to be viewed as a compliance obligation rather than marketing opportunity. The database also has limited dedicated resources. Uniform search tools that can interface with multiple technology databases both Federal and elsewhere such as the Association of University Technology Managers (AUTM) Global Technology Portal and Licensing Survey are lacking, and there is no common taxonomy of search terms. Development of tools that can link potential users with a wide range of Federal and non-Federal data and information and allocation of more resources to develop and maintain such capabilities would enhance access and private sector utilization.

Additional opportunities to broaden access might be possible through the modification of the current rules and policies that govern access to Federally funded property and equipment. Current and prospective rules discourage use of Federally funded property and equipment for non-Federal purposes (2CFR215.32; OMB Uniform Guidance 200.313(c)). They also prohibit use of equipment to provide services at less than commercial rates for equivalent services (2CFR215.34(b); Uniform Guidance 200.313(c)(3)). While not an unreasonable requirement, implementation has proved contentious, leading to confusion and disputes. Greater clarity and less prohibitive rules would encourage greater use of and access to these assets.

Similarly, the IRS "private business use" rules (Rev. Proc. 2007—47) that govern use of facilities financed by tax exempt bonds have led to considerable misunderstanding, and have had a negative impact on the ability of universities to enter into research agreements with the private sector. Of most concern is the requirement that commercial use of resulting technology by the industry sponsor is permitted only on the same terms as non-sponsors (i.e. at competitive prices), and the price must be determined at the time the technology is available for use or license. An additional impediment is created by the 1986 Tax Code requirement that limits private business use to 10% of bond-financed facilities for public institutions, and 5% for private 501(c)(3) institutions. These rules restrict the ability of the private sector to collaborate and form partnerships with Federally funded research institutions.

National Priorities

24) Which new areas should be identified as “national priorities,” either because they address important challenges confronting U.S. security or living standards, or they present an opportunity for public investments to catalyze advances, bring about key breakthroughs and establish U.S. leadership faster than what might be possible otherwise?

We believe that the Federal investment in basic research is the most important national priority to include in the American Innovation Strategy due to the unique role the Federal Government plays as the primary sponsor of basic research. Industry, philanthropic gifts, and university funded basic research are not a substitute for the Federal investment. The need for near-term technological advances, along with aversion to assuming significant investment risks for unforeseen outcomes, will continue to prevent substantial industry investments in basic research. While philanthropic gifts and university funding directed at basic research have increased in recent years, they are typically targeted for specific purposes and the investments remain relatively small. As such, they cannot make up for the Federal Government’s investment. The Federal Government is the primary funder of basic research because such investment serves the public good and the short- and long-term interests of our nation. Only the Federal Government can make such large-scale investments with long time horizons and uncertain returns.

The American Innovation Strategy should support basic research funding increases. Increased investments should be made without the offsets that would force detrimental tradeoffs between one field of science and another. To ensure our national competitiveness, we need to maintain a strong foundation of basic research across all scientific disciplines, from the physical, mathematical, and life sciences, to engineering and the social, economic and behavioral sciences. Additionally, within the context of strong Federal investments in basic research, it is important to ensure that Federal scientific agencies, guided by their scientific advisory committees and boards, continue to set priorities for funding within and among the full range of scientific disciplines. This principle has served the nation well for decades.