

**Dr. John Mason, Vice President for Research
Auburn University
Subcommittee on Research & Science Education
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Mr. Chairman and members of the Subcommittee, thank you for the opportunity to participate in today's panel. The topic of today's hearing is critical not only to the future of higher education but critical to the future well-being of the United States and quality of life of every American.

My name is John Mason, and I have the privilege of serving as vice president for research at Auburn University. Mr. Chairman, Auburn is pleased to operate a research center in your district, and we appreciate your support and interest as we work with industry and other universities to advance cyber security, unmanned vehicle systems, aerospace engineering, biotech and much more.

You may have heard it said that "research is to teaching what walking is to running; you have to do the first in order to do the second."

If we want robust education in this country, all the way from kindergarten to the post-graduate level, it starts with the creation of new knowledge. Research is the foundation on which teaching and the transfer of knowledge is based.

When research is reduced, instruction and learning at all levels are diminished, especially in those disciplines where much of our innovation originates – those in science, technology, mathematics and engineering.

As research declines, bright kids do not select these tougher academic disciplines. U.S. industry and government have fewer skilled employees for the advanced positions that move our economy. And with fewer educators involved in research, there is less transfer of knowledge from faculty to the next generation of workers and to industry.

Mr. Chairman, to put today's discussion in context, I offer findings of a December 2011 report from Battelle and R&D Magazine. They found that Asia, for the first time, will this year surpass the Americas in the share of total global research and development spending. Asia will account for almost 37 percent of global R&D while the U.S. and other nations in the Americas will slip to 36 percent. In another study, Asia's R&D is rapidly expanding and shows no sign of "slowing down." The long-term implications for U.S. prosperity and security are profound.

Auburn is a land-, sea- and space-grant university with 25,000 students. We focus on five strategic, interdisciplinary areas in our research enterprise: energy and the environment, health sciences, cyber systems, transportation, and the STEM disciplines, those of science, technology, engineering and mathematics.

We work in partnership with federal agencies and American business and industry to accomplish objectives of national need. Auburn has produced such break-through scientific discoveries as the vapor wake canine that screens passengers and cargo for explosives and educated such leading technology innovators as Apple CEO Tim Cook.

A priority research area for Auburn is security – the security of our cyber infrastructure, food supply and energy resources. In cyber, Auburn experts are innovating across the broad cyber spectrum, from open source intelligence to workforce development to research for defense, homeland security and law enforcement agencies.

Auburn food safety scientists are leading an effort to improve education and training for food inspectors so they're better prepared to detect problems in the food supply. And Auburn food safety engineers are developing bacteria-detecting biosensors that will significantly improve the security of our food system.

In energy, Auburn provides leadership and expertise in biofuels. Researchers are developing an economically-viable and reliable system, from genetics to harvest, that delivers a stable supply of high-quality biomass feedstock to liquid fuel producers.

Auburn Research stands ready and willing to assist in these and other vital national challenges. We have more information online at www.auburn.edu/research.

In looking at the major challenges Auburn faces, similar to our peers, there are regulatory burdens placed on all recipients because of what appears to be the improper actions of a few. Increased audits, inspections and regulatory complexity rob valuable resources from the actual work. We recognize and embrace the value of oversight and transparency, but the balance has tipped much too far toward redundant reviews and audits that focus on process instead of results.

One example is the sub-recipient monitoring requirement found in OMB Circular Number A-133. States, local governments and non-profits are required to audit other federal grantees including universities through which federal funds flow. The same universities we're auditing are also audited by other universities. And those we audit are directly receiving federal funds, indicating the federal government's satisfaction with their performance and compliance. The multiple layers of review are financially onerous for both the federal government and research institutions.

As a result of reduced federal and state funding, we have been forced to eliminate some projects we can no longer sustain. A notable example is Auburn's Space Research Institute that recently closed as external support from NASA and industry was curtailed.

Research, along with instruction and outreach, is part of Auburn's institutional mission. It's part of our responsibility to enhance competitiveness of future leaders and our workforce. And, as previously mentioned, it provides the base of knowledge for economic development.

We view relevant fundamental research as the underpinning of industry nationwide. At Auburn, we call it putting ideas to work.

Relevant fundamental research is that which industry can apply to innovate, create or improve products and services, and, ultimately, create jobs. It came to the U.S. in the 1800s, following the German model of academic research and giving our country its ability to compete in the industrial revolution.

One of the most important pieces of legislation to our nation's economic foundation was the Morrill Act of 1862 that created land-grant colleges and universities. To this day, the Morrill Act continues to pay nationwide dividends as an economic development tool, in particular by solving problems and making agriculture and manufacturing more efficient and productive. A few years later, the Hatch Act energized research and experimentation in the land-grant system that was essential to the growth of our young nation.

At Auburn, our model combines research with technology transfer capabilities, an incubator supporting start-ups, a research park where technology businesses flourish, and close collaboration with an affiliated non-profit foundation. Although these elements are not unique, the key to their success is the relational operation of how they work together toward the same goal, rather than functioning as independent silos.

Results come in the form of licensing technologies to companies, formation of new businesses, established companies locating in our park, and development of collaborations between industry and Auburn faculty. New start-ups using technologies developed at Auburn include those in health services, public health, recycling, nano-medicine and agriculture production.

Working closely with industry is often facilitated through our non-profit research foundation, and those partnerships are key to our future competitiveness. And throughout this process, we pay particular attention to commercializing inventions, which is one of the best methods of getting new knowledge into the hands of users and creating jobs.

Attached for your information is a chart illustrating how each of the individual parts work together and link research to economic development.

Mr. Chairman, we believe the report offers insightful and forward-looking recommendations, and we urge Congress to consider them carefully and act accordingly.

With limited time, I offer specific comments on just a few.

In recommendations one and seven, we believe that a comprehensive review of policies and regulations is perhaps the most important of this report. Streamlining the process, relieving unnecessary and costly administrative burdens, and coordinating research priorities among disparate federal agencies will invigorate research universities exponentially.

Regarding recommendation number four on university productivity, we must certainly remain vigilant in seeking and addressing efficiencies. It's however important to note that cuts to programs have consequences. Once academic and research programs are eliminated, they're not easily restored.

Recommendation number five deserves serious attention. Long-term initiatives with universities in partnership with business and industry will help remove the uncertainty that wastes time and resources and hinders investigator creativity. Short-term shifting of national priorities creates a perverse incentive to chase the funding instead of the next discovery.

Finally, a national discussion on international students and scholars is long overdue. International graduate students are often the most skilled, but regulations involved in allowing them to work on projects are often counter-productive to the stated national security concerns.

In closing, I urge the Subcommittee to consider the potential of a program similar to the National Defense Education Act of 1958. Those fellowships were provided in the Cold War era out of fear the Soviet Union would control space. The federal government paid tuition for a student working on an advanced science degree. It helped with the debt load of students, focused research in an area of national need and defined career paths for young people with an interest in science.

While the national concern at that time was space, the concern today is economic. The tuition waivers are an inexpensive way to accomplish needed research on a national need. A program such as this one may represent another solution for Congress to consider.

Mr. Chairman, we at Auburn are confident that relevant fundamental research enables teaching and learning. We're confident that investment in relevant fundamental research is an investment in job creators. And we're confident that relevant fundamental research is the basis for prosperity and security.

Thanks to the Subcommittee for examining these important issues, and thank you for the opportunity to provide my testimony.