ARIZONA STATE UNIVERSITY
FISCAL YEAR 2010 FEDERAL AGENDA

This document articulates and highlights ASU’s federal priorities for the FY10 Congressional cycle. It is intended to provide our Congressional offices, and others, background information about ASU — which is one of the largest universities in the United States.

This briefing book does not capture the breadth of all federal activities and issues that confront a major research institution such as ASU. It focuses on many of our key initiatives and highlights some of our core capabilities and articulates President Crow’s vision for where this multi-campus institution is headed.

Many additional issues, including fiscal and policy-related, will confront us throughout the Congressional cycle. We anticipate active engagement with our delegation on a myriad of issues as we with our delegation’s assistance move ASU forward to become A New American University.

Stu Hadley
Assistant VP for Policy Affairs and
Executive Director of Federal Relations
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The American West has always been a place where the individualism, egalitarianism, competitiveness, and optimism of our national culture have received their most resonant expression—nowhere more so than here in Arizona. The New American University now emerging at Arizona State University reflects this frontier spirit and represents a pioneering effort to redefine the American research university, and to design an institution that combines the highest levels of academic excellence, inclusiveness to a broad demographic, and maximum societal impact.

Arizona State University is mid-point in a decade of unprecedented change and decisive maturation, positioning itself to emerge as a prominent national university and comprehensive knowledge enterprise committed to teaching, discovery, creativity, and innovation. At once the youngest and the largest of the roughly 150 public and private research-grade universities in our nation, ASU enrolls more than 60,000 undergraduate, graduate, and professional students on four campuses of equally high aspiration configured across metropolitan Phoenix. The university is a federation of 23 unique interdisciplinary colleges and schools that together with departments and cutting-edge research institutes and centers comprise close-knit but diverse academic communities that are international in scope.

ASU is the only American research institution planning for significant enrollment growth. Because the infrastructure of our state university system has not kept pace with population growth, ASU is expanding its capacity to provide academic programs of the highest quality to the many gifted and creative students who do not conform to a standard academic profile, as well as offering access to students who demonstrate every potential to succeed but lack the means to pursue a four-year undergraduate education. The current level of investment in undergraduates through scholarship and need-based gift support is approaching $100 million annually and for graduate students exceeds $50 million. We have greatly expanded both our investments in general financial aid and in programs designed to help low-income Arizona students attend and graduate. The number of students enrolled from families below the poverty line has risen by roughly 500 percent, and we have increased the number of Pell Grant recipients by one-third, from 9,200 to 12,300 recipients.

The emerging stature of our university is underscored by the growing number of recipients on the faculty roster of prestigious national and international honors. During the past five years ASU has recruited more members of the National Academies than the sum total of Academy members on the faculty in its more than forty-five years as a Ph.D.-granting institution. Record numbers of students continue to be honored with national scholarships and awards, and we welcome more freshmen National Merit Scholars than almost any public university in the nation. And while the freshman class has increased in size by 33 percent during the past five years, enrollment of students of color has increased by 64 percent.

Although we are first and foremost committed to educating the students of Arizona, we are equally a discovery organization. As we look back on the past five years, we note a number of important milestones, including the establishment of major interdisciplinary research initiatives such as the Biodesign Institute, the Global Institute of Sustainability (GIOS), MacroTechnology Works, and the Center for the Study of Religion and Conflict. During this period ASU has established more than a dozen new interdisciplinary schools, including the School of Global Studies, the School of Human Evolution and
Social Change, and the School of Earth and Space Exploration.

Research related spending, including sponsored projects and Technology and Research Initiative funding (TRIF), reflects the success of an institution in competing for funding from sponsors, including federal, state, and private sources, and is an important indicator of the overall contribution of an institution both to the knowledge base and the regional economy. In the past six years, ASU has doubled its research related spending. In FY 2007 overall research-related spending, including sponsored projects and TRIF, were up 7.4 percent, totaling $218 million. During FY 2006 that figure first surpassed the $200 million level. ASU is one of only a handful of major research universities without both an agricultural and medical school to have attained this distinction. Peer institutions in this category include Caltech, MIT, and Princeton.

During the past five years we have initiated a dramatic infrastructure expansion to create more than seven million square feet of new academic space, including world-class research facilities such as the Biodesign Institute complex, named 2006 Laboratory of the Year by R&D Magazine. Consistent with our institutional commitment to sustainability, four recently completed buildings have been recipients of a Leadership in Energy and Environmental Design (LEED) designation from the U.S. Green Building Council (USGBC), including a platinum ranking for the second Biodesign building. Advancing our intent to encourage residential options on our campuses, Hassayampa Academic Village was completed during FY 2007, bringing to the Tempe campus almost 2,000 new beds and additional classrooms. Ground breaking took place in FY 2008 for the Barrett Honors College complex, comprising 1,700 beds and academic space.

The Comprehensive Development Plan being implemented is redefining the relationships between the four differentiated ASU campuses, the clusters of colleges and schools that comprise each campus, and the university and surrounding metropolitan region. The successful 2006 City of Phoenix bond election allowed us to advance our new Downtown Phoenix campus. During the summer of 2006 both the College of Public Programs and the College of Nursing and Healthcare Innovation relocated downtown, and during the past year construction started on the new Walter Cronkite School of Journalism and Mass Communication building and a 1,250-bed public/private partnership student housing facility. Both will be available for initial occupancy in the summer of 2008. In terms of enrollment, both the nursing and journalism schools are the largest in the nation. ASU and the University of Arizona are transforming downtown Phoenix and improving healthcare in Arizona by working together to create a twenty-first century model for biomedical teaching and research. Just east of the new downtown campus, the joint biomedical campus is home to the University of Arizona College of Medicine’s Phoenix program in partnership with ASU, which welcomed its first cohort of first-year medical students in August 2007. The Translational Genomics Research Institute (TGen), a strategic partner, is fully operational on the site, and the ASU Department of Biomedical Informatics in collaboration with UA has also located on the campus. Consistent with our public engagement we continue to advance clinical partnerships with institutions such as Mayo Clinic.

ASU has been ranked as one of the top one hundred universities in the world by the Institute of Higher Education, Shanghai Jiao Tong University. Placing one-hundredth in their 2006 “Academic Ranking of World Universities” signals that ASU has attained international recognition as a research institution: unlike other rankings, the indicators of the Jiao Tong methodology weight academic quality as a function of the scientific and scholarly contributions of faculty, including research citations and research output as measured by publication in leading journals. ASU places 54th among U.S. universities in the assessment.

The New American University now emerging reflects our ongoing effort to build a sustainable environment and economy for Arizona, leverage regional competitive advantage through strategic global engagement, and tackle the major challenges of our age. ASU is a public asset that belongs to all the citizens of Arizona, and its progress to date is the result of the effort and dedication of the many constituencies it serves. ASU’s evolving position reflects both the growing success of the new “culture of academic enterprise” and the investment of individuals, foundations, corporations, and governments that recognize that a competitive world-class research university is essential both to the success of the region and the needs of society.

Michael M. Crow
President
<table>
<thead>
<tr>
<th>Enrollment</th>
<th></th>
<th>Race/Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASU unduplicated total</td>
<td>62,476</td>
<td></td>
</tr>
<tr>
<td>ASU at the Tempe campus</td>
<td>50,397</td>
<td>African Am.</td>
</tr>
<tr>
<td>ASU at the West campus</td>
<td>8,950</td>
<td>Am. Indian</td>
</tr>
<tr>
<td>ASU at the Polytechnic campus</td>
<td>8,283</td>
<td>Asian Am.</td>
</tr>
<tr>
<td>ASU at the Downtown Phoenix campus</td>
<td>7,705</td>
<td>Hispanic</td>
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<tr>
<td><strong>Students</strong></td>
<td></td>
<td>White</td>
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<tr>
<td>Undergraduates</td>
<td>49,472</td>
<td>International</td>
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<tr>
<td>Graduate Students</td>
<td>13,004</td>
<td>Unknown</td>
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<tr>
<td>Gender</td>
<td></td>
<td>Total Minority</td>
</tr>
<tr>
<td>Undergraduates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>24,054</td>
<td>48.6%</td>
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<tr>
<td>Women</td>
<td>25,418</td>
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<tr>
<td>Graduate Students</td>
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<td></td>
</tr>
<tr>
<td>Men</td>
<td>6,201</td>
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<td>Women</td>
<td>6,803</td>
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<tr>
<td>Full-time/Part-time</td>
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<td></td>
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<tr>
<td>Undergraduates</td>
<td></td>
<td></td>
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<tr>
<td>Full-time</td>
<td>40,714</td>
<td>82.3%</td>
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<tr>
<td>Part-time</td>
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<td>17.7%</td>
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<tr>
<td>Graduate Students</td>
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<tr>
<td>Full-time</td>
<td>8,212</td>
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<td>Part-time</td>
<td>4,792</td>
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<tr>
<td><strong>Student Credit Hours and Full-Time Equivalent</strong></td>
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<td></td>
</tr>
<tr>
<td>Lower-division</td>
<td>314,236</td>
<td>20,949</td>
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<tr>
<td>Upper-division</td>
<td>346,782</td>
<td>28,899</td>
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<tr>
<td>Graduate</td>
<td>109,414</td>
<td>10,941</td>
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<td>Total</td>
<td>770,432</td>
<td>60,789</td>
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<td><strong>Academic Year 2007–2008</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall/Spring unduplicated headcount</td>
<td>72,647</td>
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## Enrollment

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<thead>
<tr>
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<th>2008</th>
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<tbody>
<tr>
<td>ASU unduplicated total</td>
<td>67,082</td>
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<tr>
<td>ASU at the Tempe campus</td>
<td>52,734</td>
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<tr>
<td>ASU at the West campus</td>
<td>9,572</td>
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<td>ASU at the Polytechnic campus</td>
<td>9,614</td>
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<td>ASU at the Downtown Phoenix campus</td>
<td>8,431</td>
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## Level

<p>| | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td>Undergraduates</td>
<td>53,298</td>
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<tr>
<td>Graduate Students</td>
<td>13,784</td>
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## Gender

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<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Undergraduates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>25,799</td>
<td>48.4%</td>
</tr>
<tr>
<td>Women</td>
<td>27,499</td>
<td>51.6%</td>
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<tr>
<td>Graduate Students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>6,519</td>
<td>47.3%</td>
</tr>
<tr>
<td>Women</td>
<td>7,265</td>
<td>52.7%</td>
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</table>

## Full-time/Part-time

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Undergraduates</td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>43,145</td>
</tr>
<tr>
<td>Part-time</td>
<td>10,153</td>
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<tr>
<td>Graduate Students</td>
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<tr>
<td>Full-time</td>
<td>8,469</td>
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<tr>
<td>Part-time</td>
<td>5,315</td>
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## Race/Ethnicity

<table>
<thead>
<tr>
<th></th>
<th>Undergrad</th>
<th>Grad</th>
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<tbody>
<tr>
<td>African Am.</td>
<td>2,465</td>
<td>4.6%</td>
</tr>
<tr>
<td>Am. Indian</td>
<td>1,215</td>
<td>2.3%</td>
</tr>
<tr>
<td>Asian Am.</td>
<td>3,013</td>
<td>5.7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>8,109</td>
<td>15.2%</td>
</tr>
<tr>
<td>White</td>
<td>34,761</td>
<td>65.2%</td>
</tr>
<tr>
<td>International</td>
<td>1,264</td>
<td>2.4%</td>
</tr>
<tr>
<td>Unknown</td>
<td>2,471</td>
<td>4.6%</td>
</tr>
<tr>
<td>Total Minority</td>
<td>14,802</td>
<td>27.8%</td>
</tr>
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## Student Credit Hours and Full-Time Equivalent

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<thead>
<tr>
<th></th>
<th>SCH</th>
<th>FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower-division</td>
<td>369,431</td>
<td>24,629</td>
</tr>
<tr>
<td>Upper-division</td>
<td>336,927</td>
<td>28,077</td>
</tr>
<tr>
<td>Graduate</td>
<td>113,051</td>
<td>11,305</td>
</tr>
<tr>
<td>Total</td>
<td>819,409</td>
<td>64,011</td>
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## New Undergraduates

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>First-time Freshmen</td>
<td>9,707</td>
</tr>
<tr>
<td>First-time Full-time Freshmen</td>
<td>8,458</td>
</tr>
<tr>
<td>First-time Freshmen from AZ High Schools</td>
<td>6,603</td>
</tr>
<tr>
<td>New Transfers</td>
<td>5,446</td>
</tr>
<tr>
<td>New Nondegree-seeking</td>
<td>323</td>
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## Entering Freshman Credentials

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Average High School GPA</td>
<td>3.41</td>
</tr>
<tr>
<td>Average High School Rank</td>
<td>26.1%</td>
</tr>
<tr>
<td>Average SAT</td>
<td>1082</td>
</tr>
<tr>
<td>Average ACT</td>
<td>23.5</td>
</tr>
</tbody>
</table>

## Freshmen Scholars

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>National Merit Scholars</td>
<td>166</td>
</tr>
<tr>
<td>President’s Scholars</td>
<td>884</td>
</tr>
<tr>
<td>Provost’s Scholars</td>
<td>1,185</td>
</tr>
<tr>
<td>University Scholars</td>
<td>833</td>
</tr>
<tr>
<td>National Hispanic Scholars</td>
<td>103</td>
</tr>
<tr>
<td>National Achievement Scholars</td>
<td>4</td>
</tr>
</tbody>
</table>

## Persistence and Graduation

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>First-year Retention Rate (Fall 2007 cohort)</td>
<td>79.5%</td>
</tr>
<tr>
<td>6-year Graduation Rate (Fall 2002 cohort)</td>
<td>55.8%</td>
</tr>
<tr>
<td>4-year Graduation Rate (Fall 2004 cohort)</td>
<td>31.9%</td>
</tr>
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</table>

## Degrees Awarded (AY 2007–08)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Baccalaureate</td>
<td>10,706</td>
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<tr>
<td>Masters</td>
<td>3,082</td>
</tr>
<tr>
<td>Doctoral</td>
<td>418</td>
</tr>
<tr>
<td>Law</td>
<td>238</td>
</tr>
<tr>
<td>Total Degrees Awarded</td>
<td>14,444</td>
</tr>
</tbody>
</table>

## Undergraduate Costs

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Resident tuition &amp; fees</td>
<td></td>
</tr>
<tr>
<td>All campuses</td>
<td>$5,661</td>
</tr>
<tr>
<td>Nonresident tuition &amp; fees</td>
<td></td>
</tr>
<tr>
<td>Tempe &amp; Downtown Phoenix campuses</td>
<td>$17,949</td>
</tr>
<tr>
<td>West &amp; Polytechnic campuses</td>
<td>$17,947</td>
</tr>
<tr>
<td>Room and Board</td>
<td>$8,790</td>
</tr>
<tr>
<td>Books</td>
<td>$1,130</td>
</tr>
</tbody>
</table>
ASU CAMPUS LOCATIONS
DOE CENTER OF EXCELLENCE ON ELECTRIC POWER SYSTEM RELIABILITY

OBJECTIVE

A university-industry collaboration seeking innovative solutions to critical challenges to electric power transmission and distribution reliability. Using a multidisciplinary, geographically-diverse organization, such a Center would

- seek innovative solutions to reliability challenges in today’s and tomorrow’s electric power system;
- stimulate productive interchange of ideas among university, government and industry professionals;
- leverage and integrates research funding from universities, government and industry;
- facilitate rapid access to highly experienced faculty and superior quality students; and
- prepare current and future professionals for the new power industry.

BACKGROUND

A U.S. DOE priority is to meet the nation’s long-term energy needs and protect economic security by promoting delivery of reliable, affordable, and environmentally sound electric energy. In its National Transmission Grid Study, the DOE reported to Congress that electric transmission constraints threaten reliability. The transmission system was not designed to support the new uses of the grid found in emerging regional electricity markets. Reliability is at risk in today’s wholesale generation marketplace, with its increased volume of transactions and long distance power flows, and staggeringly complex operating environment. Better ways must be found to operate the existing transmission grid to overcome congestion when it occurs. Both technological and market-based solutions are required, so pricing and customer participation options should be considered along with enhanced transmission investment and improved system operations. In addition, a looming manpower shortage faces the electric power industry. Some 25% of the current workforce will retire in the next five years. University resources are essential to helping DOE address the challenge of maintaining a reliable electric transmission grid for future generations.
PROGRAM

Section 925 (f) entitled “Transmission and Grid Planning and Operations Center of the Energy Policy Act of 2005” authorizes the Department of Energy to “establish a comprehensive research, development, and demonstration program to ensure the reliability, efficiency, and environmental integrity of electrical transmission and distribution systems...” The section also states that the DOE Secretary shall consider implementing the program under this section using a consortium of participants from industry, institutions of higher education, and National Laboratories.

We assume that such a center would be competitively awarded and the funding would not be used for bricks and mortar.

Such a Center’s academic researchers must specialize in a range of expertise including power systems, applied mathematics, non-linear systems, power electronics, control theory, computing, operations research, economics, industrial organization and public policy. In collaboration with industry, they must provide the research services and products that add value to industry, and that support efficient and reliable provision of electricity services while meeting environmental requirements.

Every state wants to expand its economy, to develop a skilled workforce, and to obtain benefits from technology transfer. Thus, in establishing standards and operating protocols for regional reliability organizations, the unique requirements, situations, and experiences of the states must be considered. An appropriately designed, geographically-diverse university Center of Excellence can play an important role in understanding and integrating state experiences in electric system restructuring so that each state benefits from electric transmission reliability enhancements.

FY10 REQUEST

ASU urges support to fund the already authorized section of the Energy Policy Act of 2005: “The Committee provides $8,000,000 to be competitively awarded for a geographically distributed multi-university center of excellence in electric power transmission and distribution.”
(a) **Program.** — The Secretary shall establish a comprehensive research, development, and demonstration program to ensure the reliability, efficiency, and environmental integrity of electrical transmission and distribution systems, which shall include—

(1) advanced energy delivery technologies, energy storage technologies, materials, and systems, giving priority to new transmission technologies, including composite conductor materials and other technologies that enhance reliability, operational flexibility, or power-carrying capability;

(2) advanced grid reliability and efficiency technology development;

(3) technologies contributing to significant load reductions;

(4) advanced metering, load management, and control technologies;

(5) technologies to enhance existing grid components;

(6) the development and use of high-temperature superconductors to—

(A) enhance the reliability, operational flexibility, or power-carrying capability of electric transmission or distribution systems; or

(B) increase the efficiency of electric energy generation, transmission, distribution, or storage systems;

(7) integration of power systems, including systems to deliver high-quality electric power, electric power reliability, and combined heat and power;

(8) supply of electricity to the power grid by small scale, distributed and residential-based power generators;

(9) the development and use of advanced grid design, operation, and planning tools;

(10) any other infrastructure technologies, as appropriate; and

(11) technology transfer and education.

(b) **Program Plan.** —

(1) **In General.** — Not later than 1 year after the date of enactment of this Act, the Secretary, in consultation with other appropriate Federal agencies, shall prepare and submit to Congress a 5-year program plan to guide activities under this section.

(2) **Consultation.** — In preparing the program plan, the Secretary shall consult with—

(A) utilities;

(B) energy service providers;

(C) manufacturers;

(D) institutions of higher education;

(E) other appropriate State and local agencies;

(F) environmental organizations;

(G) professional and technical societies; and

(H) any other persons the Secretary considers appropriate.
implementing the program under this section using a consortium of participants from industry, institutions of higher education, and National Laboratories.

(d) Report. — Not later than 2 years after the submission of the plan under subsection (b), the Secretary shall submit to Congress a report—
   (1) describing the progress made under this section; and
   (2) identifying any additional resources needed to continue the development and commercial application of transmission and distribution of infrastructure technologies.

(e) Power Delivery Research Initiative—
   (1) In general. — The Secretary shall establish a research, development, and demonstration initiative specifically focused on power delivery using components incorporating high temperature superconductivity.
   (2) Goals. — The goals of the Initiative shall be—
      (A) to establish world-class facilities to develop high temperature superconductivity power applications in partnership with manufacturers and utilities;
      (B) to provide technical leadership for establishing reliability for high temperature superconductivity power applications, including suitable modeling and analysis;
      (C) to facilitate the commercial transition toward direct current power transmission, storage, and use for high power systems using high temperature superconductivity; and
      (D) to facilitate the integration of very low impedance high temperature superconducting wires and cables in existing electric networks to improve system performance, power flow control, and reliability.
   (3) Inclusions. — The Initiative shall include—
      (A) feasibility analysis, planning, research, and design to construct demonstrations of superconducting links in high power, direct current, and controllable alternating current transmission systems;
      (B) public-private partnerships to demonstrate deployment of high temperature superconducting cable into testbeds simulating a realistic transmission grid and under varying transmission conditions, including actual grid insertions; and
      (C) testbeds developed in cooperation with National Laboratories, industries, and institutions of higher education to—
         (i) demonstrate those technologies;
         (ii) prepare the technologies for commercial introduction; and
         (iii) address cost or performance roadblocks to successful commercial use.

(f) Transmission and Distribution Grid Planning and Operations Initiative—
   (1) In general. — The Secretary shall establish a research, development, and demonstration initiative specifically focused on tools needed to plan, operate, and expand the transmission and distribution grids in the presence of competitive market mechanisms for energy, load demand, customer response, and ancillary services.
   (2) Goals. — The goals of the Initiative shall be—
      (A)(i) to develop and use a geographically distributed center, consisting of institutions of higher education, and National Laboratories, with expertise and facilities to develop the underlying theory and
software for power system application; and
(ii) to ensure commercial development in partnership with software vendors and utilities;
(B) to provide technical leadership in engineering and economic analysis for the reliability and efficiency of power systems planning and operations in the presence of competitive markets for electricity;
(C) to model, simulate, and experiment with new market mechanisms and operating practices to understand and optimize those new methods before actual use; and
(D) to provide technical support and technology transfer to electric utilities and other participants in the domestic electric industry and marketplace.

(g) HIGH-VOLTAGE TRANSMISSION LINES. — As part of the program described in subsection (a), the Secretary shall award a grant to a university research program to design and test, in consultation with the Tennessee Valley Authority, state-of-the-art optimization techniques for power flow through existing high voltage transmission lines.
OBJECTIVE

This request is to implement/fund a program already authorized in PL 110-140, the Energy Independence and Security Act of 2007.

BACKGROUND

Section 471 of H.R. 6 creates grant and loan programs to support institutions of higher learning, school districts, local governments, and municipal utilities in their efforts to help meet our energy challenges (collectively, these entities are referred to as “institutions” in the language of the bill). There are four general segments of Section 471: technical assistance grants (program #1), grants for energy efficiency improvement and sustainability (program #2), grants for innovation in energy sustainability (program #3), and loans for energy efficiency and sustainability. The combined authorization level for the three grant programs is $250 million for fiscal years 2009 to 2013 and the loan program is authorized for up to $500 million over the same period. Currently, there is no funding available for the Section 471 programs; however, the projects that would be eligible should funding be provided are intended to

- develop renewable energy facilities;
- improve the energy efficiency of buildings;
- promote innovative energy sustainability projects; and
- provide funding to accelerate deployment of sustainable infrastructure.

One-half of all funding appropriated for grant programs #2 and #3 is set aside for institutions of higher education. Additionally, one-half of all funding to institutions of higher education will be awarded to institutions with small endowments.
GRANT PROGRAM #1
TECHNICAL ASSISTANCE GRANTS

The Secretary of Energy will provide grants to assist institutional entities to identify, evaluate, and implement sustainable energy infrastructure, which includes renewable energy and other highly efficient technologies. Up to $50,000 is available for feasibility studies, up to $90,000 is available to compare alternatives and evaluate economic barriers, and up to $250,000 is available for detailed engineering.

GRANT PROGRAM #2
GRANTS FOR ENERGY EFFICIENCY IMPROVEMENT AND SUSTAINABILITY

The Secretary of Energy will provide grants to assist institutional entities improve energy efficiency on the grounds of the institution, including universities. At least one grant will be awarded to an institution of higher education in each state, with a requirement that the institution implement a public awareness campaign. Projects are evaluated based on improvements to energy efficiency, reductions in greenhouse gas emissions, increased use of alternative energy, and active student participation. Up to $1 million is available for each project.

GRANT PROGRAM #3
GRANTS FOR INNOVATION IN ENERGY SUSTAINABILITY

The Secretary of Energy will provide grants to assist institutional entities in the development of sustainable technologies that are either innovative applications of existing technology or technology that is not yet commercially available. At least two grants will be awarded to institutions of higher education in each state, with requirements for implementing a public awareness campaign. Up to $500,000 is available for each project.

GRANT PROGRAM #4
LOANS FOR ENERGY EFFICIENCY IMPROVEMENT AND ENERGY SUSTAINABILITY

The Secretary of Energy will provide loans to implement energy efficiency and sustainable energy at institutions of higher education, school districts, local governments, and municipal utilities. Selection criteria include improvements in energy efficiency, reduction of greenhouse gases, use of renewable energy, reduction in fossil fuels, and need for funding assistance.

FY10 REQUEST

ASU requests $250 million for the grant program per P.L. 110-140, section 471 and $500 million for the loan program per P.L. 110-140, section 471.

Below is a Dear Colleague letter and signatures from 125 university and college presidents urging funding and implementation of the already authorized program.
HELPING OUR COLLEGES AND UNIVERSITIES MAINTAIN THEIR LEADERSHIP ON SOLVING OUR ENERGY CHALLENGES

March 18, 2008

Dear Colleague:

Please join us in writing to the Chairman and Ranking Member of the Appropriations Subcommittee on Energy and Water Development asking that they fully fund the new “Energy Sustainability and Efficiency Grants and Loans for Institutions” program created by Section 471 of the Energy Independence and Security Act (PL 110-140).

As you know, many of our colleges and universities have been providing leadership on energy sustainability. Section 471 of last year’s energy bill was created, in part, to recognize this leadership and also to assist colleges and universities as they continue to initiate sustainable energy and energy efficiency projects on their campuses. It authorizes $250 million annually in grants and another $500 million in direct loans for renewable energy and energy efficiency projects at higher education institutions as well as public schools, or local governments.

This new grant program is supported by the American Association of State Colleges and Universities (AASCU), the American Association of Community Colleges (AACC), and the National Association of Independent Colleges and Universities (NAICU). Additionally, a large number of college and university presidents have expressed their support for this program in a letter sent to Chairman Dorgan and Ranking Member Domenici, which we have attached.

Thank you for your consideration of this matter. If you would like to sign the letter, please contact Jessica Maher in Senator Sanders’ office at 4-5141 or Kathleen Frangione in Senator Kerry’s office at 4-2742 by Thursday, March 20, 2008. We appreciate your support.

Sincerely,

Bernard Sanders
United States Senate

John F. Kerry
United States Senate

attachment
March 17, 2008

The Honorable Byron Dorgan, Chairman
The Honorable Pete Domenici, Ranking Member
Energy and Water Development Appropriations Subcommittee
United States Senate
Washington, D.C. 20510

Dear Chairman Dorgan and Ranking Member Domenici:

We ask you to support fully funding the "Energy Sustainability and Efficiency Grants and Loans for Institutions" program created by Section 471 of the Energy Independence and Security Act (P.L. 110-140). This program will enable colleges and universities to move toward creating and implementing sustainable energy projects on their campuses. As you know, P.L. 110-140 authorizes $250 million annually in grants and another $500 million in direct loans for renewable energy and energy efficiency projects at higher education institutions as well as public schools, or local governments.

More specifically, the authorization provides a minimum of one grant for improving energy efficiency, and two grants for innovation in energy sustainability, to universities in each state. Additionally, the legislation allows for grants of up to $1 million for energy efficiency and renewable energy projects, and grants of up to $500,000 for innovative energy sustainability projects on university campuses. One of the most exciting parts of the legislation is its requirement to involve students. In fact, this program recognizes the large role that today’s students can – and will – play in shaping the nation’s energy future, and it requires that many of the projects funded by the initiative involve students in their planning, implementation, and evaluation.

We believe that this program has the dual purpose and value of moving the nation toward a sustainable energy future, and aiding institutions of higher education as they address the core issue of global warming. The program is supported by the American Association of State Colleges and Universities (AASCU), the American Association of Community Colleges (AACC), and the National Association of Independent Colleges and Universities (NAICU). A large number of college and university presidents have expressed their support for this funding in a separate letter to you.

We understand that you will face difficult choices this year and ask that you fund this program at the highest level possible. Thank you for your consideration.

Sincerely,

Cc: Chairman Byrd
   Ranking Member Cochran
March 14, 2008

The Honorable Byron Dorgan, Chairman
The Honorable Pete Domenici, Ranking Member
Energy and Water Development Appropriations Subcommittee
United States Senate
186 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Dorgan and Ranking Member Domenici;

On behalf of the thousands of higher education institutions, organizations, students, industry partners, faculty, and administrators throughout the nation who are committed to helping the U.S. find a pathway towards a more sustainable energy future, we write to you today to urge you to fully fund the new Department of Energy "Energy Sustainability and Efficiency Grants and Loans for Institutions" program created by Section 471 of the Energy Independence and Security Act (PL 110-140).

As a major sector of society, higher education can play an important leadership role in accelerating U.S. energy independence and freedom from dependence on foreign oil by moving towards a clean energy economy. Higher education has the intellectual capital, moral position, and research capacity to take on such a leadership role. And leading society to such a low carbon and more energy-secure economy fits squarely within its educational, research, and public service missions.

Higher education has made a strong commitment to exert this leadership, as exemplified by The American College & University Presidents Climate Commitment. This high-visibility, joint and individual commitment to reduce and eventually neutralize campus greenhouse gas emissions has now been signed by nearly 500 colleges and universities.

These schools and many others who have made such commitments are now struggling to find the funds to make dramatic changes in reducing their carbon emissions and related energy bills. Higher education's collective energy bill is estimated to be $8-10 billion annually, and energy expenses are generally the second largest budget line item after salaries for many campuses.

This new program will provide institutions of higher learning, school districts, local governments, and municipal utilities with loans and funding for capital projects that:

1) Develop renewable energy facilities;
2) Improve the energy efficiency of buildings;
3) Promote innovative energy sustainability projects; and
4) Provide funding to accelerate deployment of sustainable infrastructure.

We expect the outcomes of this program to include:

- providing other sectors with a model for moving towards a clean energy economy
- new thinking and technology for deploying alternative sources of energy, helping the US take back the lead from European countries in this arena, and
- significantly reducing college and university operating costs over time.

We thank you for considering this important request. Please contact James Elder, Director of the Campaign for Environmental Literacy (Elder@FundEE.org, 978-526-7768) with any questions about this letter.
Ocean County College, NJ
Ohio University, OH
Onondaga Community College, NY
Park University, MD
Paul Smith's College, NY
Pratt Institute, NY
Prescott College, AZ
Purchase College, SUNY, NY
Rider University, NJ
Rosemont College, PA
Rose-Hulman Institute of Technology, IN
Saint John's University, MN
Saint Peter's College NJ
San Francisco State University, CA
Shenandoah University, VA
Smith College, MA
Southern Polytechnic State University, GA
Southwestern College, KS
State University of New York Cortland, NY
State University of New York at Oswego, NY
St. Clair County Community College, MI
St. Lawrence University, NY
Stony Brook University, NY
The City College of New York, NY
The College of New Jersey, NJ
The Evergreen State College, WA
Towson University, MD
Trinity University, TX
Unity College, ME
University of Arkansas, AK
University at Buffalo; SUNY, NY
University of California, San Diego, CA
University of Central Florida, FL
University of Central Missouri, MO
University of Cincinnati, OH
University of Colorado at Boulder, CO
University of Idaho, ID
University of Maine at Fort Kent, ME
University of Maine at Machias, ME
University of Maryland, Baltimore, MD
University of Memphis, TN
University of Minnesota Morris, MN
University of Montana, MT
University of North Texas, TX
University of Rhode Island, RI
University of Redlands, CA
University of St. Francis, IL
University of Washington, WA
University of Wisconsin - Eau Claire, WI
University of Wisconsin - River Falls, WI
University of Wisconsin Oshkosh, WI
University of Wisconsin - Stevens Point, WI
University of Wisconsin - Superior, WI
University of Wisconsin - Whitewater, WI
Virginia Wesleyan College, VA
Warren Wilson College, NC
Kenneth P. Ruscio, President
Kathi Hiyane-Brown, President
Ann Millner, President
Evan S. Dobelle, President
Michael S. Bassis, President
Mike Pieper, VP - Finance and Operations
Sharon D. Herzberger, President
Arnold Speert, President
Lorna Duphiney Edmundson, President
Judith Ramaley, President
Janelle C. Ashley, President

Washington and Lee University, VA
Whatcom Community College, WA
Weber State University, UT
Westfield State College, MA
Westminster College, UT
Western Technical College, WI
Whittier College, CA
William Paterson University, NJ
Wilson College, PA
Winona State University, MN
Worcester State College, MA
The President’s Budget for the Department of Energy (DOE) proposed $280,000,000 to launch eight Energy Innovation Hubs in FY2010—one focused on each of the national energy topics related below:

1. Solar Electricity (EERE),
2. Fuels from Sunlight (SC),
3. Batteries and Energy Storage (SC),
4. Carbon Capture and Storage (FE),
5. Electrical Grid Systems (ED),
7. Extreme Materials for Nuclear Fuel Cycles and Systems (NE), and

Secretary of Energy Steven Chu has identified the problems in these areas as presenting the most critical barriers to achieving national energy and climate goals. The existing structures for research, development and commercialization are not organized in a way that will produce the advances required quickly enough to meet the national goals.

Accordingly, in a new structure modeled on the DOE’s Bioenergy Research Centers, each Hub will focus on a single topic, integrating in a single institution work spanning the gamut from (i) basic research through (ii) engineering development to (iii) commercialization.

Each Hub will comprise a highly collaborative team, spanning multiple scientific, engineering, economics, and public-policy disciplines. By bringing together top talent across the full spectrum of R&D performers—including universities, private industry, non-profits, and National Laboratories—each Hub should become a world-leading R&D center in its area.

The Hubs will include early-stage research and will seek to drive solutions. Each Hub will embrace within its topical area the goals of delivering technologies well suited to large scale commercialization, without barriers between basic and applied research.

The scientific collaboration the Hubs will foster is made possible by the proposed sustained investment. Each Hub is proposed to be
funded at $25 million per year, for a five-year term, with additional start-up funding of $10 million in the first year for renovation (but not “bricks and mortar”), equipment, and instrumentation. Under the proposal, funding for the Hubs that deliver exceptional scientific progress could be renewed once for a second five-year term. The DOE FY 2010 budget proposes $280 million for Hubs ($35 million for each of 8 Hubs.)

Funding will be competitively awarded to Hubs selected on the basis of external peer-review of proposals submitted in response to a Funding Opportunity Announcement (FOA). After awards are made, a team of DOE and external reviewers will periodically review Hub progress, and also evaluate renewal requests, for action by an Oversight Board established by the Secretary.

What distinguishes the proposed Energy Innovation Hubs from others now pursuing energy research: principal investigators, the recently launched Energy Frontier Research Centers, and the new ARPA-E?

- **Single and small groups of investigators** conduct discovery science with the goal of understanding the world. Individual investigators may propose research activities in any topical area supported by the Office of Science. Understanding how nature works is the key to ultimately predicting and controlling materials properties, but this research is not required to link to applications. Typical awards are $150,000/year per PI in the university sector and more in the laboratory sector. Activities are reviewed every 3 years, and there is no sunset provision.

- **Energy Frontier Research Centers** are virtual centers composed of a set of self-assembled investigators, often spanning several science and engineering disciplines, to address fundamental science questions that must be answered in order to remove roadblocks to transformational energy technologies. This research is “use inspired” discovery science, motivated by the need to solve a specific problem, such as energy storage, photoconversion, CO2 sequestration, etc. The funding range is $2–5M/year. Activities are reviewed every 5 years, and there is no sunset provision. Successful EFRCs will advance fundamental science relevant to real-world energy systems.

- **ARPA-E** will support R&D of potentially very high commercial impact that is deemed too risky for industrial investments. ARPA-E will implement DARPA’s highly entrepreneurial approach to mission-oriented R&D by funding scientists and technologists (sometimes by forging partnerships of its own design) to accelerate an immature energy technology with exceptional potential to the point that it can get past the risk barriers that prevent its translation from the bench to the marketplace. ARPA-E generally will not fund discovery science, nor will it support incremental improvements to current technologies. Projects could range from as low as $500,000 to as high as $10 million. ASU is also supportive of adding appropriations report language which would ask the Dept of Energy to review the matching requirements for this program (and others) given the very difficult financial stresses states are experiencing.

- **Energy Innovation Hubs** will engage a larger set of investigators spanning science, engineering, and policy disciplines, but focused on a single critical national need identified by DOE. Top talent drawn from the full spectrum of R&D performers—universities, private industry, non-profits, and government labs—should enable each Hub become a world-leading R&D center in its area. With robust links to industry, the highly integrated Hubs will bridge the gap between basic scientific breakthroughs and industrial commercialization. Initial awards, for a maximum of $135 million over a five year term, will be openly competed among R&D performers. There will be one opportunity for a 5-year renewal.
Hubs differ from the other structures by having a larger scale and duration, with a strong focus on results, that will support multiple players as they pursue solutions to a tough problem. Increased collocation, and their interdisciplinary makeup, will allow the Hub teams to surface and share novel ideas that will help them overcome barriers. Adequate resources, and the discretion to reallocate funding, will let the Hubs pursue new research opportunities or alternatives as soon as they emerge—without the delays that impede other government programs.

FY10 REQUEST

Support the President’s FY10 budget request at the $280 million level. ASU is encouraged by the Department of Energy’s recommendation for funding the eight hubs. We are particularly interested in supporting the request for the hubs that have a solar research theme.
NATIONAL SCIENCE FOUNDATION

CURRENT STATUS AND FY09 REQUEST

In FY07, ASU had nearly $40 million in expenditures from NSF. This is one of the largest sources of research funding from the federal government for ASU.

- NSF’s FY07 budget: $5.9 billion
- NSF’s FY08 budget: $6.06 billion
- NSF’s FY09 President’s Budget Request: $6.49 billion
- American Recovery and Reinvestment Act: $3 billion
- ASU’s FY10 request for NSF’s budget: $7 billion

ASU supports an increase of at least 13% for the NSF, the figure included in the Administration’s budget. The PBR for FY09 is based on projected increases for the Administration’s American Competitiveness Initiative and comports with targets outlined in the America COMPETES Act, supported by a vast majority of the 110th Congress and signed into law in 2007. This rate of growth is necessary in part to compensate for growth not realized, although strongly supported by Congress and the Administration, in FY08. In support of his agency’s FY09 budget request, NSF Director Arden Bement stated that, “More than a dozen major studies have now concluded that a substantial increase in federal funding for basic scientific research is critical to ensure the preeminence of America’s scientific and technological enterprise.”

ASU therefore supports the FY10 Appropriations Request of at least $7 billion, which is the authorized level from the America Competes Act.
BIODESIGN INSTITUTE

The Biodesign Institute is the engine powering an ambitious effort to vault Arizona State University into the ranks of a world-class research university by 2012. The rapid translation of this vision has had an impact in promoting discovery, advancing educational excellence and contributing to Arizona’s economic health.

RESEARCH IMPACT

Increasingly, academic research institutions must demonstrate “proof-of-concept” that innovative bench research can work on the scale required at a cost that is feasible for adoption by society. Conducting research in the 21st century requires a critical mass of intellectual horsepower and greater collaboration with clinical, industrial and governmental partners.

This was a driving force behind the development of the Biodesign Institute, and the institute has assembled a team of world-class researchers who are applying this horsepower in four broad areas of focus:

- Creating personalized medical diagnostics and treatments
- Outpacing Infectious disease
- Cleaning the environment and seeking alternative energy sources
- Securing a safer world

Following are highlights of progress in each of these key areas.

PERSONALIZED MEDICINE DIAGNOSTICS AND TREATMENTS

There is a significant need for more targeted treatments and diagnostics that not only detect disease earlier but predict response to treatment. This will allow for the application of individualized therapies that are safer and more effective.

Partnership for Personalized Medicine: In September 2007, the Biodesign Institute, Translational Genomics Institute (TGen) and the Fred Hutchinson Cancer Research Center in Seattle launched
this globally focused collaboration, fueled by a $35 million donation for the Virginia G. Piper Trust. The Flinn Foundation contributed an additional $10 million to help spur Arizona-specific initiatives. This partnership has an emphasis on diagnostics and is aimed at improving patient outcomes and reducing health care costs.

Cancer Vaccine: This effort, in collaboration with the Mayo Clinic, aims to develop a vaccine to protect against multiple types of cancer. In 2007, the project received a boost of nearly $9 million in funding from two separate sources to further its innovative efforts. (See major funding list on page X).

Presymptomatic Diagnostics: A device to detect disease presymptomatically is being pursued by a diverse team representing five of the institute’s 10 research centers.

OUTPACING INFECTIOUS DISEASE

Because nature is constantly adapting, outpacing infectious disease requires rapid identification of any emerging disease and swift development of a vaccine to stop the spread of that disease. Infectious disease remains the top killer of children and young adults in developing countries. In addition, many vaccines created in the United States and Europe are ill-suited for areas of the world that lack cold-chain storage, public health infrastructure and comparable financial resources. So, there is a need for new vaccines for existing globally impactful diseases. Finally, work done to fight disease from natural causes can promote preparedness in the event of a bioterrorist attack.

Pneumonia Vaccine for Newborns: Supported by funding from the Bill and Melinda Gates Foundation, Biodesign researchers hope to begin human clinical trials of this new vaccine within a year. Created to address a global need, the vaccine is expected to be extremely low-cost to produce and will be an oral, single-dose vaccine, providing protection against nearly all forms of bacterial pneumonia.

HIV/AIDS Prevention: The variety of projects aimed at the global AIDS epidemic include vaccine research as well as topical barriers, called microbicides, aimed at blocking infection from the virus that causes AIDS.

Rapid Vaccine Development: With the urgent need for faster vaccine development to address the ever-present threat of a bioterrorist attack or emergence of a pandemic such as avian flu, Biodesign researchers are exploring novel ways of creating vaccines using rapid genomic sequencing technology and synthetic production of vaccines.

West Nile Virus: A team of researchers is using tobacco plants to produce novel treatments against the virus. This is a new project recently funded by the National Institutes of Health (NIH).

Given the scope of infectious disease, the projects above represent simply an overview of some of the research underway. Other projects include studies of
global problems such as malaria, tuberculosis, Buruli ulcer (declared an emerging public health threat by the World Health Organization), and corona viruses (such as SARS).

ENERGY AND THE ENVIRONMENT

Water, waste and energy. These areas of the environment are closely interrelated. The institute is developing new ways to use microbial communities for important tasks such as detoxifying contaminated water, turning waste into energy and creating new biofuels that avoid the pitfalls of many biofuel options.

Microbial Biofuel (“Tubes in the Desert“): With funding from BP and Science Foundation Arizona, ASU researchers are optimizing tiny, photosynthetic bacteria to produce biodiesel. Biodiesel is a sustainable, high-energy fuel that can be used in conventional engines.

Called “Tubes in the Desert,” the project gets its name from the fact that the bacteria will be grown in transparent tubes that could be constructed virtually anywhere with sufficient sunlight—on a rooftop or on nonarable land. So, this biofuel won’t compete with food crops. The bacteria’s yield per acre also is anticipated to be much higher than any known biofuel because they grow much faster than sources such as corn or sugar cane and contain a high percentage of fat.

The research team of nearly one hundred individuals is developing a rooftop-scale test bed facility on the Tempe campus that is anticipated to be operational in late spring. Based on information gathered from this test over two years, the second phase will involve constructing a large-scale test site of 2.5 acres adjacent to an Arizona Public Service power plant. Because the bacteria make biofuel using carbon dioxide, this proximity provides a way to reduce a power station’s carbon emissions.

Biohydrogen Energy: A $2.5 million philanthropic investment spanning five years will drive research in developing alternative fuel that uses sunlight and advanced bacteria to create biohydrogen. In harnessing energy from sunlight using microbial photosynthesis to produce biohydrogen, ASU’s biohydrogen project aims to create the ideal environmentally benign energy source that is easy and economical to produce and does not generate greenhouse gases or air pollution. A second part of this project focuses on converting waste materials from the initial process to produce even more hydrogen.

Solar Energy: The Biodesign Institute has a number of projects exploring various aspects of solar energy. One of these — funded by a $1.1 million grant from the National Science Foundation — is an innovative project designed to break through the current technological hurdles of solar energy and make it a more viable energy source.
**Microbial Fuel Cells**: A revolutionary new environmental biotechnology, the Microbial Fuel Cell (MFC) turns the treatment of organic wastes into a source of electricity. The scientific breakthrough, leading to advancement of this project, is the recent discovery that some bacteria can transfer electrons into an electrode and create electricity. The MFC takes advantage of this by allowing microorganisms to remove the electrons from organic compounds in biomass, including waste materials. These can include human sewage, animal waste, and agricultural wastes.

The Biodesign Institute also has significant research in converting biomass to gaseous fuels and in removing oxidized contaminants (e.g., perchlorate and trichloroethylene), from drinking water.

**SIGNATURES FOR SECURITY**

Society now lives with the specter of global terrorism. Many researchers at the Biodesign Institute have skills and knowledge that can contribute significantly to enhanced national security.

Recognizing the critical need for dramatic improvements in the speed at which vaccines can be developed against rapidly emerging diseases, a newly launched effort focuses on establishing a standard operating procedure for developing and eventually validating vaccines. It aims to take advantage of Biodesign’s unique capabilities in vaccine delivery platforms, genomics and high throughput systems. The initial target will be a malaria vaccine.

The institute is also
- developing new vaccines against bioterrorist threats such as plague and smallpox;
- pursuing detection of liquid explosives on a large scale based on the institute’s development of a technology to rapidly detect liquid peroxide explosives in as little as fifteen seconds. This is one of several projects for detecting various types of explosives under way at Biodesign; and
- creating large-scale disaster response technologies to safeguard against a “dirty bomb” incident.

**ECONOMIC IMPACT**

The investments made by ASU and the state legislature in launching the Biodesign Institute have enabled a bold new approach to academic research—one focused on solving urgent societal problems using large teams collaborating in a highly focused manner. This investment is beginning to generate significant returns in terms of both research progress and economic impact.
The institute
- generated research funding totaling $105 million from June 2002 to December 2007;
- is expected to generate research funding of $57 million in fiscal year 2008, a 148 percent increase from the prior year;
- has recruited 58 new faculty to ASU and has created more than 500 jobs since 2002;
- enables a hands-on research experience for more than 250 undergraduate and graduate students per semester;
- has filed more than 335 invention disclosures with Arizona Technology Enterprises (AzTE) since inception; and
- filed three new patent applications in FY 2007 and has had 10 new patents issued in the past two years.

The following are awards and gifts in excess of $1 million committed during the past calendar year to fund Biodesign research.
- $45 million initiative to develop personalized diagnostics. Philanthropic investment from the Virginia G. Piper Trust ($35 million) and the Flinn Foundation ($10 million) provided to the Biodesign Institute and TGen. Nobel laureate Dr. Lee Hartwell, of the Fred Hutchinson Cancer Research Center, is leading the effort.
- $18 million for a Center of Excellence in Genomic Science to understand the relationship of cell growth and decline to human health. The award from the National Institutes of Health went to Dr. Deirdre Meldrum.
- $6.9 million to develop a breast cancer vaccine. It was an Innovator Award from the Department of Defense to Dr. Stephen Albert Johnston.
- $3.2 million to develop a rapid test for urinary tract infections. This award came from the National Institutes of Health to Dr. Joseph Wang of the Biodesign Institute and the UCLA Veteran’s Administration.
- $2.5 million to generate hydrogen fuel using photosynthetic bacteria. This was a philanthropic investment from Brian and Kelly Swette to an ASU cross-departmental team.
- $2.2 million to develop a biodiesel fuel from photosynthetic bacteria. This award came from Science Foundation Arizona and was awarded to Dr. Neal Woodbury with a matching contribution from BP.
- $1.5 million to tackle West Nile virus using plant-based therapeutics. The award was from the National Institute of Allergy and Infectious Diseases to Dr. Qiang Chen.
- $1.2 million to develop a vaccine against multiple types of cancer. This was a philanthropic investment from the W.M. Keck Foundation to Dr. Doug Lake.
- $1 million to improve the detection of explosives. The funding came from Motorola to Dr. Joseph Wang.

EDUCATIONAL IMPACT

The Biodesign Institute is training the next generation of researchers who can engage in solving global problems. In addition to providing hands-on research opportunities to 250 graduate and undergraduate students per semester, the institute operated the state’s largest summer high school internship program in 2007. This summer, the institute will add a summer research experience for teachers from 30 schools. A middle school outreach program has also been launched. It trains teachers in the classroom utilization of an engaging, computer-based program in which students solve “medical mysteries” while learning scientific inquiry and bioscience concepts.
DECISION THEATER

OBJECTIVE

To secure competitive grants and contracts from federal agencies to fund projects and to support the research mission of Arizona State University’s Decision Theater. ASU is targeting 3–4 projects ($100,000–$200,000 each) for FY 09, which is the third year of operation. The targeted federal agencies include the Department of Homeland Security, Department of Energy, U.S. Geological Survey, Environmental Protection Agency, National Oceanic and Atmospheric Administration, Department of Labor, Center for Disease Control, National Institute of Health, and the National Science Foundation.

BACKGROUND

The Decision Theater at Arizona State University is a world-class facility for science-based, informed analysis to help policy makers and the general public to visualize the future through the exploration of alternative scenarios. Located in the Brickyard building in downtown Tempe, the Decision Theater provides an immersive experience for groups of up to 25 people in a room largely enclosed by seven high-resolution, rear-projection screens. With its emphasis on community engagement and policy relevance, the Decision Theater is one of the key tools in ASU’s transformation to become a use-inspired, socially-embedded “New American University”.

The primary mission of the Decision Theater is to serve as a home for policy makers and the community to participate in immersive, collaborative decision-making; to visualize possibilities and realize solutions.

BUDGET

Start-up funding for the ASU Decision Theater was provided by a $3 million gift from Ira Fulton, a local entrepreneur and home builder. The University matched the gift with $2 million in additional funding. The operational budget for FY 2007 is $2 million, which is fund-
ed by means of sponsored projects and grants, the Technology and Research Fund, and additional private donations.

**FY10 REQUEST**

The ASU Decision Theater has relied upon private funding and matching University funds for initial construction and start up. The first set of funded projects has been sponsored by local and State agencies, and the National Science Foundation. ASU will actively attempt to secure Federal funding from multiple funding streams in FY09, including projects sponsored by DHS, DOE, EPA, USGS, NOAA, NSF, DOL and DARPA.
UNIVERSITY SUSTAINABILITY PROGRAMS

BACKGROUND

The Higher Education Sustainability Act amends the Higher Education Act to authorize a new $50 million grant program at the Department of Education. At full funding, this program will annually support between 25 and 100 sustainability projects at higher education institutions and consortia/associations. This bill has been included in the House version of the Higher Education Act, HR 4137, in the section entitled “University Sustainability Programs” – that bill is headed right now to conference – so has not been enacted yet. We anticipate passage and seek FY09 appropriations to implement this section:

Individual institutions are eligible for funding to:

a) develop and implement administrative and operations practices that test, model, and analyze principles of sustainability;
b) establish multidisciplinary education, research, and outreach programs that address the environmental, social, and economic dimensions of sustainability;
c) support research and teaching initiatives that focus on multidisciplinary and integrated environmental, economic, and social elements;
d) establish initiatives in the areas of greenhouse gas reductions, energy, waste and toxics management; purchasing; transportation; and other sustainability aspects;
e) support student, faculty, and staff work at institutions of higher education to implement, research, and evaluate sustainable practices;
f) establish sustainability literacy as a requirement for undergraduate and graduate degree programs; g) integrate sustainability curriculum in all programs of instruction, particularly in business, technology, manufacturing, engineering, and science programs.

Associations and consortia are eligible for funding to:
A) conduct faculty, staff and/or administrator trainings;
B) compile, evaluate and disseminate best practices, guidelines and standards;
C) engage external stakeholders such as business and alumni,
D) create analytical tools to assess and measure institutional progress; and
E) develop educational benchmarks.

HESA also directs the Secretary of Education to convene a national summit on sustainability in higher education to focus on efforts of national distinction and to create recommendations for addressing sustainability through institutions of higher education. HESA has been included in the House version of the new higher education bill (HR 4137) without a specific authorization amount, which is now (as of April 2008) in conference with the Senate.

**FY10 REQUEST**

ASU urges this section be included in the Higher Education Act and funding be appropriated at the hopefully authorized level of $50 million per year.
FEDERAL PELL GRANT

The Pell Grant program is the federal government’s single largest source of grant aid for postsecondary education students and continues to be a high priority for ASU.

BACKGROUND

The Pell Grant program provides grants (i.e., aid that does not have to be repaid) to needy undergraduates. Need is determined based on information submitted by students on the Free Application for Federal Student Aid (FAFSA) which determines expected family contribution (EFC). The EFC is what is expected to be contributed by the student and his or her family toward postsecondary education expenses. Pell Grants are portable, that is, the grant aid follows students to the eligible postsecondary education institutions in which they enroll. Institutions that receive a valid SAR or valid ISIR for a student meeting other program eligibility requirements must disburse a Pell Grant to such student. The size of the grants is based, principally, on the financial resources that students and their families are expected to contribute toward postsecondary education expenses, and the maximum grant that the annual appropriations process sets for the program.

STUDENT ELIGIBILITY

To be eligible for a Pell Grant, a student must meet requirements that apply to federal student aid in general and requirements specific to the Pell Grant program. Among the requirements generally applicable to federal student aid are the following:

- Students must be enrolled for the purpose of earning a degree or certificate at an eligible institution. Students must have a high school diploma or the recognized equivalent. Absent such diploma or its equivalent, students must demonstrate an ability to benefit from postsecondary education by passing an examination approved by ED.

- Students have to maintain satisfactory academic progress while enrolled in postsecondary education in order to be eligible for federal student aid. Satisfactory progress is delineated by policies developed by each participating higher education institution.
• Conviction for possession or sale of drugs can disqualify students for federal student aid.

• Students are ineligible if they are in default on a Title IV student loan or have failed to repay an overpayment on a Title IV grant.

• Students must meet citizenship requirements. Males between 18 and 25 years of age must register with the selective service system in order to eligible for federal student aid.

ASU-SPECIFIC INFORMATION

During 2006–2007, the number of Pell Grant recipients at ASU totaled 11,716.

FY10 REQUEST

The ARRA provides for $5,350 per grant, up from $4,850 in FY09, $4,731 in FY08, and $4,310 in FY07. Under this construct, ASU requests that $5,550 be appropriated per grant, $200 over the ARRA figure.
KAET-TV – CORPORATION FOR PUBLIC BROADCASTING

KAET(TV), known to viewers by its “Eight” channel position, was established in 1961. Licensed to the Arizona Board of Regents for and on behalf of Arizona State University, Eight has worked in partnership with ASU to be a powerful means of community outreach and an independent catalyst for community involvement. Through programming that is intended to inspire, educate and engage viewers, Eight’s mission is to specialize in lifelong learning, the education of children, the presentation of unbiased news and public affairs and the celebration of arts and culture. KAET accomplishes its goals through the power of noncommercial television, the Internet, other media, educational outreach services and a variety of community-based activities and initiatives.

THE “EIGHT” FAMILY OF SERVICES:

- Eight PBS, the “regular” analog channel 8
- Eight HD, the high definition digital channel 8.1
- Eight Create, the standard definition lifestyle program service, digital channel 8.2
- KBAQ Production Studio, records over one hundred local classic music performances for broadcast on KBAQ-FM.
- azpbs.org web site is a media rich internet destination with videos, resources and links to KAET programming.
- Ready to Learn, an ongoing series of seminars, half in Spanish, to teach caregivers how to utilize the educational content of PBS Kids programs, as well as teaching other literacy skills.

KAET IS GROWING

- Eight moves to a new building in late summer 2008. This new facility will be located in downtown Phoenix. Over 1.3 million different people view Eight every week
- Eight has recently leased a repeater-transmitter to serve Yuma, a community with no local PBS station.
- Eight plans to develop a portfolio of new, prime-time, weekly programs to address key state issues. The cornerstone topics are Arizona education, Arizona sustainability, Arizona health issues, Arizona science / technology / innovation, and Arizona arts.
ON THE HORIZON

- Digital conversion for rural areas. KAET must not only fund the digital conversion of its seven owned/operated rural community translators but also must find a way to convert the dozen-plus translators operated by community co-ops.
- Expand digital production resources to meet community needs for locally produced programming.
- Take greater role in pre-K education initiatives.

Eight/KAET’s annual budget is approximately $12 million. Nearly two-thirds comes from the local community, mainly through membership support and program underwriting. Another 15% is state and federal support through Arizona State University and the Corporation for Public Broadcasting. The rest comes from schools, colleges, grants, contracts and other sources.

FY09 REQUEST

Within the Labor/HHS/Ed appropriations subcommittee:
ASU supports funding for the Corporation for Public Broadcasting at a level of $483 million for FY2011 (forward funded program). This is a critical funding stream for KAET.

The Corporation for Public Broadcasting is forward funded. So the $483 million request is for FY2011.

Advance funding is a longstanding practice recognizing the unique nature of Public Broadcasting. It allows stations to insulate programming decisions from political influence, maximize funding efforts, and have the critical lead-in time needed to plan and produce high quality noncommercial programming.
TUITION INCREASES AT ASU

BACKGROUND

In December 2007, the Arizona Board of Regents raised full-time resident undergraduate tuition levels for ASU’s four campuses. On the Tempe and Downtown campuses, the increase from $4,821 to $5,063 yearly amounts to a 5.0% increase for returning students, while the increase from $4,821 to $5,409 yearly amounts to a 12.2% increase for students beginning in Fall 2008. The Polytechnic and West campuses saw a 5.0% increase for returning students and a 17.1% increase for new students.

Despite the increase, ASU’s resident tuition remains set at a level no higher than the top of the bottom third (i.e., just under the 33rd position) of resident tuition rates at the senior public institutions in the fifty states, thereby complying with the Arizona Board of Regents policy (ABOR Policy Manual 4-104). This rate of tuition allows higher education to be affordable and reasonable for students and their parents and at the same time provides the level of resource support necessary to ensure a quality undergraduate experience and the supply of educated citizens needed to support Arizona’s economic growth.

RATIONALE FOR TUITION INCREASES

At ASU, resource funding has not kept pace with growth. In FY2006, total ASU resources from tuition and state appropriation (operating and capital) totaled $13,473 per student. Resources at UCLA, Berkeley, Michigan (identified by the Goldwater Institute as a model public university for Arizona), Minnesota, and Ohio State were almost double that amount—all at $20,000 or more per student, per data from the National Center for Education Statistics.

COMPARISONS TO PEER INSTITUTIONS

In the Pac-10 conference, the University of Arizona and ASU ranked
as the ninth and tenth institutions respectively in resident tuition (although Stanford and the University of Southern California should be omitted because, as private institutions, they distort the data set). This complies with the Arizona constitutional policy that tuition at Arizona Universities should be “as nearly free as possible” (Article 6, §11).

**Tuition at Pac-10 Conference Schools Since 2000**

![Graph showing tuition increases at Pac-10 Conference Schools since 2000](image)

**ENSURING GROWTH**

By paying for a portion of their education through tuition and fees, students make the best investment they can in their future, including increasing their lifetime earnings by more than 100% on average if a graduate degree is pursued.

The accolades ASU has garnered in recent years, including profiles by the journal *Nature* highlighting interdisciplinary educational research, programs, and partnerships, and the Associated Press highlighting ASU’s dynamic nature, help raise the perceived value of an ASU degree as well—benefitting all ASU students and alumni.
The NIH has risen to become the single largest contributor to research at ASU. In FY2008, ASU had expenditures of over $40,000,000 from the NIH. This was a 15.6% increase over the FY07 level.

ASU is very appreciative for the $10B included in the ARRA for NIH. This funding will build both physical infrastructure and human capital, providing immediate positive economic impacts as well as an important foundation for long-term recovery.

A seven-percent ($2.1B) increase over FY09 for the NIH is a step to strengthen NIH’s annual budget so the agency can continue to fund leading-edge research and educate the next generation of scientists. Strong, sustainable and predictable funding levels for science agencies, including the National Institutes of Health, will keep our nation globally competitive and will be a key for economic stability into the future.

FY10 REQUEST

For FY10, ASU requests $32.4B. The President’s Budget Request for FY10 is $30.8B, and in previous years has been:

- FY09: $30.3B,
- FY08: $29.2B,
- FY07: $28.8B
The Solution Exists: Nurse Practitioners and Nurse-Managed Health Centers are Mission Critical to Easing the Health Care Crisis

Even as the physician shortage worsens, Nurse Practitioners (NP) in primary care are able to triple the number of patients served. There are currently over 80,000 NPs in primary care and there is widespread acceptance of NPs as independent care providers among patients. Nurse practitioners are the fastest growing group of primary care professionals in the country. In the coming years, the number of NPs will rise significantly. Enhanced NP involvement in primary care has the potential to dramatically increase access to health care, improve care for patients with chronic diseases, and improve the efficiency of the health care system, all by maximizing the use of our existing health care resources. While increasing access to health insurance will help improve access to health care, our nation’s health care crisis cannot be solved by insurance coverage alone. At the same time that policies are enacted to provide health insurance for all Americans, plans must also be implemented to enable patients to use that insurance to receive care that is affordable, timely and of high quality by removing barriers to access to existing providers such as NPs. To date, only 53% of managed care companies directly credential NPs as primary care providers (PCP). The majority of the plans that offer NPs primary care provider status are Medicaid (73%). Of those companies that will credential NPs as PCPs, only 56% reimburse NPs at the same rate as physicians for the same level of care. Primary care provider status and parity in reimbursement are essential so that clinics that NPs own or where they are employed can generate the revenue required to provide services, pay the bills and offer competitive salaries and benefits to essential support staff. In addition, NPs must be permitted to be clinical directors of Federally Qualified Community Health Centers in order to enable increases in the number and growth of those clinics.

Nurse-Managed Health Centers—an innovative delivery model for primary and preventive care, especially for low-income and vulnerable populations—will also be a vital ingredient in any plan to increase the capacity of the nation’s health care delivery system. The good news is that these nurse practitioner-led facilities are a “solution in plain sight” that already has been tested in over 40 states. Today, there already are over 250 Nurse-Managed Health Centers...
across the U.S. providing assistance to millions of Americans. It is estimated that these existing health centers could be expanded to reach over 20 million Americans, a significant number of the estimated 46 million Americans without health care insurance. NMHC have three main funding streams; 35% comes from reimbursement by private and public insurance policies; 41% from grants; 24% from gifts. As a result, 65% of NMHC revenue to support services is in peril every year. Long term financial stability of NMHC depends on health insurance reimbursement of NPs as PCP.

The role that Nurse Practitioners and Nurse Managed Health Centers can play in providing high quality, affordable evidence based primary care must be part of the planning when true reform is being debated.
THE RISING COSTS OF MENTAL HEALTH CARE
ROUTINE SCREENING AND EARLY INTERVENTION IN PRIMARY CARE SETTINGS AS A KEY SOLUTION

The Problem

By 2023, projected costs for the treatment of chronic diseases, such as mental health disorders, cancer, hypertension, diabetes and heart disease, will be $99B in Arizona, of which more than $25B could be avoidable. Mental health disorders are projected to cost the state of Arizona $24B in 2023, followed by cancer ($24B) and hypertension ($20B) (Milken Institute, 2007).

One in 4 children and adolescents (i.e., 15 million) in the United States (U.S.) have a mental health problem that interferes with their functioning at home or at school, yet only 20 to 25 percent of these children receive any treatment (American Psychological Association, 2006). Significant health disparities also exist in the receipt of mental health services, with a disproportionate number of Hispanic and African-American children affected. Furthermore, there is a shortage of 30,000 child psychiatrists across the U.S., which is contributing to the severe gap in child and adolescent mental health services (Melnyk et al., 2003). In Arizona, the psychiatric physician-to-population ratio is less than the national average, with only 134 child psychiatrists practicing in the state in 2004. One-third of the counties (i.e., 5 of 15) in Arizona have no child psychiatrists. Primary care providers (PCPs), such as physicians and nurse practitioners (NPs), are in a unique position to identify and manage common behavioral and mental health problems among children and adolescents as approximately 75 percent of children with mental health disorders are seen in primary care settings. However, screening for mental health problems as well as early identification and treatment is not routine in the majority of primary care practices, in large part due to the fact that reimbursement from insurers is not provided for mental health screening.

In a recent telephone survey conducted by the Annenberg Public Policy Center with over 700 PCPs findings indicated that:
1. most PCPs believed that it was their responsibility to tend to the physical and mental health of their patients,
2. the majority of PCPs did not ask about mental health during routine adolescent exams, and
3. only half of the PCPs reported feeling capable of handling mental health disorders. Sixty-seven percent of the PCPs reported
that the mental health treatment resources in their community are inadequate.

The Solution

Reimbursement from insurers needs to occur for mental health screening in primary care settings. In addition, due to the shortage of psychiatrists, federal training dollars need to be increased to prepare more psychiatric mental health nurse practitioners and nurse practitioners who are dually prepared as pediatric/family NPs and psychiatric mental NPs to work in primary care settings where families have established relationships and are therefore more likely to comply with treatment and follow-up. In addition, more research funding is needed for the National Institute of Nursing Research and the National Institute of Mental Health to develop and test brief preventive and early interventions that can be delivered in primary care for individuals who are at risk for and have mental health disorders.
EVIDENCE-BASED PRACTICE
A KEY SOLUTION TO IMPROVING QUALITY OF HEALTH CARE AND REDUCING HEALTH CARE COSTS.

The Problem
Although federal agencies, the Institute of Medicine (IOM), insurers and leaders in healthcare have advocated for the use of evidence-based practice (EBP) by health professionals because findings from studies support that EBP leads to a higher quality of care, improved patient outcomes, decreased geographic variation in the delivery of care, reduced healthcare costs and greater job satisfaction, only a small percentage of healthcare providers consistently use an evidence-based approach to care. Although billions of dollars are invested in research every year, the majority of research findings or gold standard evidence-based primary care recommendations by the United States Preventive Services Task Force are never translated into clinical practice to improve care. It is well known that it takes an average of 17 years on average to translate findings from research into clinical practice. Major barriers to implementing evidence-based care include

- lack of knowledge and skills regarding EBP in healthcare providers,
- inadequate resources and administrative support,
- healthcare system cultures that do not support EBP,
- a lack of EBP mentors to work with point of care providers in implementing evidence-based care,
- educational programs that continue to teach health professionals the rigorous process of how to conduct research instead of an evidence-based approach to care, and
- lack of financial incentives from insurers to implement EBP.

The Solution
In order to reach the Institute of Medicine’s goal that, by 2020, 90 percent of clinical decisions are evidence-based, there must be rapid transformations in the healthcare systems to incentivize providers financially to implement evidence-based care and translate interventions that have been found to be efficacious from research into clinical practice. In additional, funding levels for translational research need to be increased and, most importantly, there needs to be a federally funded National Institute for Evidence-based Practice that assists clinicians with the rapid translation of research findings into clinical practice to improve patient outcomes.
THE RISING COSTS OF PREMATURITY
THE COPE (CREATING OPPORTUNITIES FOR PARENT EMPOWERMENT) AS A KEY SOLUTION

The Problem
Each year, more than a half million infants (i.e., 1 out of every 8) are born prematurely in the United States. Preterm birth results in extended stays in the neonatal intensive care unit (NICU), developmental delays, physical and mental health/behavioral problems, increased medical utilization and poor academic performance in the prematurely born children. Parents of premature infants experience a higher incidence of depression and anxiety disorders along with altered parent-infant interactions and overprotective parenting, which negatively impacts the development of the children. Preterm births cost the United States $26.2 billion annually. The average medical cost for healthy full-term babies from birth through their first birthday was $4,551 in 2007 dollars, of which more than $3,800 is paid for by health plans. For premature and/or low birthweight babies (less than 37 completed weeks gestation and/or less than 2500 grams), the average cost was nearly $50,000, of which more than $46,000 was borne by the health plan.

The Solution
Findings from a randomized controlled trial with 260 low-birth-weight premature infants and their parents testing the efficacy of the COPE (Creating Opportunities for Parent Empowerment) Program funded by the National Institutes of Health/National Institute of Nursing Research, found that parents who received COPE in comparison to those who received an attention control program had less stress, depression and anxiety symptoms during and two months after their infant's hospitalization. Infants in the COPE program had a 3.8-day shorter hospital length of stay (mean of 35.2 days) in the NICU than infants in the attention control group (mean of 39.2 days). Furthermore, infants in the COPE group weighing less than 1500 grams went home an average of 8 days earlier than attention control infants.

Overall, the COPE program achieved cost savings of at least $4,864 per infant. For infants less than 1500 grams, net cost savings were $9,864 per infant. Translated to a national level, this means that delivering the COPE program in NICUs across the United States could save the American healthcare system more than $2 billion dollars per year in addition to improving parent and child outcomes.

The evidence-based COPE program needs to be translated into clinical practice through Medicaid and insurer coverage so that all parents of preterm infants receive it.
U.S. ARMY’S FLEXIBLE DISPLAY CENTER

On February 10, 2004, the U.S. Army announced that ASU had won a major national competition and was awarded a cooperative agreement to establish and implement the Army’s Flexible Display Center (FDC). This award is for $43.7 million over five years. The award includes an optional additional five-year period for an additional $50 million.

The U.S. Army’s Flexible Display Center at Arizona State University is an exemplary, genuine collaborative University-Industry-Government partnership and national asset in flexible display technology research, development, and prototype manufacturing. The Center strategically deploys focused intellectual, physical, financial and management resources to dramatically accelerate full color flexible display technology and catalyze the growth of a vibrant U.S.-based flexible display industry. The Center is spearheading the national effort to provide the Future Warfighter with ubiquitous conformal and flexible displays that are lightweight, rugged, low power, and low cost, and which will significantly enhance the Warfighter’s situational awareness and operating effectiveness.

INNOVATION CAPACITY

The Center’s world class partnership brings together a synergistic set of diverse competencies operating in a pre-competitive environment that fosters teamwork and sustains innovation to deliver cutting edge scientific inquiry and engineering development. ASU faculty and dedicated engineers and scientists in the Center are collaborating with government colleagues from the Army Research Laboratory (ARL), Natick Soldier Research Development and Engineering Center (RDEC) and other government laboratories; along with key industrial partners Universal Display Corporation, U.S. Display Consortium, EV Group, Kent Displays, E Ink, Dupont Teijin Films, Litrex, AGI, SSI, and Ito America, along with technology users and large military systems integrators General Dynamics, Raytheon, L-3 Communications, Rockwell-Collins and Honeywell; and with key academic partners Princeton University, University of Texas-Dallas, University of North Texas, North Carolina A&T (an HBCU), Penn
State University, and Lehigh University. Center management structures and processes provide strategically-guided decision-making, effective project and IP management, aggressive performance metrics and clear accountabilities in the framework of full partner engagement and rapid deployment.

PROGRAM DESCRIPTION

This project funds the Army's Flexible Display Center (FDC). The objective of this project is to mature flexible display technologies toward Army applications thereby providing leap-ahead technology to our soldiers. Flexible displays are inherently rugged (no glass), light weight, conformal, potentially low cost, low power, and hence offer enhanced and new capabilities across a broad spectrum of Army applications. Areas of investigation include lightweight, low power, and rugged flexible displays. Work in this project is performed by the Army Research Laboratory (ARL).

Note: This project was previously funded in PE 0602705A project H94 and is a restructuring of ongoing research into a distinct project for visibility and management oversight.

BENEFIT TO DEPARTMENT OF DEFENSE

The cited work is consistent with the Department of Defense Research and Engineering Strategic Plan, the Army Science and Technology Master Plan, the Army Modernization Strategy, and the Army Posture Statement.

The objective of this research is to mature flexible display technology for future vehicle and future Soldier applications. The research is being conducted at the Flexible Display Center (FDC) at Arizona State University. Management will be conducted by ARL in collaboration with Natick Soldier Research and Development Center, the FDC, industry, and other university partners. In FY07, the center designed and fabricated 4” diagonal active matrix reflective and emissive displays with enhanced resolution and functionality and began to qualify the pilot line for displays up to 15” diagonal. In FY08, the FDC developed and delivers reflective displays up to 10” diagonal from the pilot line for the next generation Soldier systems. The FDC also began full color designs. In FY09, the FDC will develop and deliver up to 10” diagonal reflective and emissive displays from the pilot line with increasing performance for next generation platforms.

FY09 REQUEST

This item is included in the FY08 President’s Budget Request and has multiple funding streams:
1) In the Applied Research appropriation account

*2009 Budget Line Title: Electronics and Electronic Devices*
RDTE: R-1 Line Number: 19
PE #: 0602705A (H17)

ASU’s requested amount is equal to the President’s Budget Request level of $6.562 million.

2) In the Army RDT&E Appropriation Account.

*2009 Budget Line Title): End Item Industrial preparedness activities*
RDTE : R-1 Line Number: 177
PE #: 0708045A
FY2009 Budget amount: $5.0 million

ASU’s requested amount is equal to the President’s Budget Request level of $5.0 million.
DEPARTMENT OF DEFENSE 6.1
INDIRECT COST UPDATE

The House version of the Fiscal Year 2009 Department of Defense authorization bill directs the Government Accountability Office (GAO) to study the indirect costs of Defense grants and contracts. We believe GAO will conduct this study with its usual high degree of objectivity. We are also pleased to see that the study will assess the impact of the cost of compliance with increased research regulations on actual F&A payments and rates, and will compare recovery of F&A costs among universities, industry, and national labs receiving federal grants and contracts. The report is to be completed within one year.

Last year during the FY2008 appropriations process, Rep. John Murtha (D-PA), chairman of the House Defense Appropriations Subcommittee, raised questions about university F&A rates and placed a one-year cap on such reimbursements. The cap provides that no more than 35% of the total award can be used to pay F&A costs.

Following is the report language requesting the GAO report on F&A costs:

*Review of Cost Reimbursements on Defense Research Grants and Contracts*

The committee strongly supports federally-sponsored research and believes the relationship between the Department of Defense, universities, and other research institutions depends on each party bearing a fair share of the costs of conducting research. The committee believes that such partnerships should also rely on deliberate policies and procedures to ensure that taxpayer dollars are well used and that research institutions and scientists are adequately reimbursed for the costs of the research performed.

The committee is obligated to ensure that taxpayer dollars are properly executed and that federal policies and procedures governing payments and reimbursements for research costs are sound. The committee therefore directs the Comptroller General to conduct a review of the existing Office of Management and Budget (OMB) policies, practices, and procedures, as well
as those included in the federal acquisition regulations.

At a minimum, this report shall:

1) describe the OMB rules and regulations that guide research institutions’ facilities and administration (F&A) cost reimbursements on DOD research grants and contracts;

2) describe and assess the F&A costs that are reimbursable under current rules and explain if similar payments for such costs are made to support industry and federal laboratories that conduct research and development research on behalf of the government;

3) assess the extent to which the rules for reimbursement of F&A costs are different for the Department of Defense than for other federal agencies;

4) assess trends in negotiated F&A rates and effective (based on actual reimbursement) F&A rates for universities that receive DOD extramural research grants and contracts;

5) assess the impact to F&A costs as a result of increased federal regulations such as environmental, security, and visa issues, assess trends in actual payments by the Department of Defense for direct and indirect costs on DOD extramural research grants;

6) document current procedures DOD uses to ensure compliance with OMB guidance in reimbursing F&A costs; and

7) report on the methodology used by the government entities responsible for determining F&A rates—the Department of Health and Human Services, Division of Cost Allocation, and the Department of Defense, Office of Naval Research—to review, audit, negotiate, and ensure that F&A rates are fair and equitable to the federal government.
Contact
Senate Appropriations Subcommittee on Transportation, Housing and Urban Development, and Related Agencies.
Chair: Senator Patty Murray (WA)
Ranking Member: Senator Christopher S. “Kit” Bond (MO)

House Appropriations Subcommittee on Transportation, Housing and Urban Development, and Related Agencies.
Chair: Representative John W. Olver (MA)
Ranking Member: Representative Tom Latham (IA)

Project Sponsor
Valley Metro Rail, Inc. (METRO) with funding from the Federal Transit Administration; cities of Phoenix, Tempe and Mesa; Maricopa Association of Governments; and the Regional Public Transportation Authority (RPTA).

Section 5309 New Starts Program
Full Funding Grant Agreement
Central Phoenix/East Valley light rail transit project
The METRO 20-mile light rail project entered into a Full Funding Grant Agreement (FFGA) with the Federal Transit Administration on January 24, 2005 in the amount of $587.2 million. The FFGA calls for federal payments of $90 million in FY 2010 and $4.2 million in 2011. Due to several takedowns over the funding period, the remainder to be funded in FY 2011 is actually $6.9 million. The delegation is requested to support $96.9 million for FY2010. This amount would fulfill the FFGA funding commitment one year prior to its scheduled completion.

The METRO 20-mile project opened on time and on budget on December 27, 2008. Additional milestones over the last year included:

- A Grand Opening celebration on December 27 and 28, 2008 with approximately 150,000 boardings.
- Revenue service began on January 1, 2009.
- Average weekday boardings over the first year of operation are projected at 26,000 - Average weekday boardings in January were 30,617.
- Special event ridership is exceeding expectations -- average Saturday ridership in January was over 31,300.
Section 5309 New Starts Program
Preliminary Engineering Requests

Central Mesa
The Central Mesa corridor is funded with regional funds approved by voters in Maricopa County in November 2004. The Alternatives Analysis (AA) and Draft Environmental Impact Statement (DEIS) for the project are scheduled to be completed in FY2010. Preliminary Engineering (PE) and the Final Environmental Impact Statement (FEIS) are scheduled to begin in FY2010. The corridor is scheduled for completion of construction in 2015. METRO requests $8.5 million in FY2010 to fund PE on the Central Mesa corridor, which will be equally matched with regional funding from the PTF.

Tempe South
The Tempe South corridor is funded with regional funds approved by voters in Maricopa County in November 2004. The AA and DEIS for the project are scheduled to be completed in FY2010. PE and the FEIS are scheduled to begin in FY2010. The corridor is scheduled for completion of construction in 2015. METRO requests $8.5 million in FY2010 to fund PE on the Tempe South corridor, which will be equally matched with regional funding from the PTF.

I-10 West
The I-10 West corridor is funded with regional funds approved by voters in Maricopa County in November 2004. The AA and DEIS for the project are scheduled to be completed in mid FY2010. PE and the FEIS are scheduled to begin in FY2010. The corridor is scheduled for completion of construction in 2015. METRO requests $34.55 million in FY2010 to fund PE on the I-10 West corridor, which will be equally matched with regional funding from the PTF.

METRO requests a total of $49.45 million in Section 5309 funding for PE for the Central Mesa, Tempe South and I-10 West projects in FY2010. The federal funds will be matched with $49.45 million in local funding.

Section 5339 AA/DEIS
Central Mesa, Tempe South, I-10 West & Glendale Corridors
SAFETEA-LU created the Section 5339 Alternatives Analysis program for New Starts projects. The METRO light rail system includes plans for AA/DEIS for high capacity / light rail transit corridors in Central Mesa, Tempe South, I-10 West and Glendale. These corridors are identified in the system map below.

The METRO 57-mile light rail system was approved by Maricopa County voters in 2004, and was presented to those voters with a phased completion date of 2025.

The Central Mesa and Tempe South corridors are scheduled for completion in 2015, and in order to complete these corridors the AA/DEIS began in FY2008. Additionally, the city of Phoenix has advanced to FY2008 the AA/DEIS on the I-10 West corridor in order to coordinate with ADOT’s design concept study for lane additions on Interstate 10. Lastly, the Glendale corridor is scheduled to begin the AA/DEIS by the end of FY2009. These four AA/DEIS’s will continue into FY2010.

METRO requests a total of $9.75 million in Section 5339 funding for these four Alternatives Analysis efforts in FY2010. The federal funds will be matched with $2.43 million in local funding.

New Starts Program - Preliminary Engineering Requests

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<td>5309</td>
<td>None</td>
<td>$69,100,000</td>
<td>$34,550,000</td>
<td>$34,550,000</td>
</tr>
<tr>
<td>Central Mesa</td>
<td>5339</td>
<td>$437,500</td>
<td>$1,970,000</td>
<td>$390,000</td>
<td>$1,580,000</td>
</tr>
<tr>
<td>Tempe South</td>
<td>5339</td>
<td>$437,500</td>
<td>$2,190,000</td>
<td>$440,000</td>
<td>$1,750,000</td>
</tr>
<tr>
<td>Glendale</td>
<td>5339</td>
<td>None</td>
<td>$5,570,000</td>
<td>$1,110,000</td>
<td>$4,460,000</td>
</tr>
<tr>
<td>I-10 West</td>
<td>5339</td>
<td>$1,675,000</td>
<td>$2,450,000</td>
<td>$490,000</td>
<td>$1,960,000</td>
</tr>
</tbody>
</table>

Projects are not listed in any order of priority

For more information, call John Farly, METRO Director of Community and Government Relations
(602) 744-5550 MetroLightRail.org
IRA ROLLOVER ACT OF 2007

BACKGROUND

In August 2006, a limited version of the IRA Charitable Rollover was enacted as part of the Pension Protection Act (P.L. 109–280). This version of the IRA Charitable Rollover, which expired at the end of 2007, permitted IRA owners starting at age 70½ to make tax-free charitable gifts totaling up to $100,000 per year from their IRAs directly to eligible charities. The Joint Committee on Taxation (JCT) scored this at $856 million over ten years.

PUBLIC GOOD IRA ROLLOVER ACT OF 2007
(S. 819/H.R. 1419)

Sponsored by Senators Byron Dorgan (D-ND) and Olympia Snowe (R-ME) and Representatives Earl Pomeroy (D-ND) and Wally Herger (R-CA), this legislation builds on the success of the current limited IRA Charitable Rollover by

- making the charitable giving incentive permanent;
- making all charities eligible to receive IRA Rollover donations;
- providing IRA owners with the opportunity, starting at age 59½, to create a life-income (or deferred) gift through several planned giving options; and
- removing the present $100,000 dollar limit on donations per year.

BENEFITS OF THE IRA CHARITABLE ROLLOVER

It encourages new giving that enables charities to improve more lives. The recently expired IRA Charitable Rollover, though limited, led Americans to make millions of dollars in new charitable donations from their IRAs to support programs and services that help enrich lives and strengthen communities. According to a voluntary survey of the National Committee on Planned Giving, by mid-December 2007, Americans had made nearly $120 million in contributions to nonprofits through the IRA rollover.

It helps older Americans to support important causes without tax
penalty. At age 70½ and older, IRA owners are required to take annual distributions from their retirement accounts, even if they do not need the money, and pay taxes on it. Only those who itemize deductions receive credit if they use those funds to make charitable contributions, and the amount of their deduction may be limited by tax rules. This new incentive allows seniors who claim the standard deduction or face other tax limitations to use a portion of their IRA funds to support their cherished causes – including churches or synagogues, colleges and universities, hospitals, museums, and social service organizations – without suffering a tax penalty.

The IRA Rollover provision is also included in legislation introduced by Senators Baucus (D-MT) and Grassley (R-IA) on April 17, 2008. A bill summary from the Senate Finance Committee it states, “The tax benefit that allowed taxpayers to make tax free contributions from their IRA plans to qualified charitable organizations expired on December 31, 2007. The proposal would extend the provision to the end of 2009. The proposal would extend the provision to the end of 2009.

ASU supports the IRA Charitable Rollover provision.
There is a new requirement for governmental entities to withhold 3 percent on payments for goods and services (Notice 2008-38). This includes public universities and colleges. Although the new requirement is not scheduled to go into effect until January 1, 2011, five-year contracts were signed in 2006 and later will be impacted.

ASU and organizations such as NACUBO are concerned that this requirement may impose significant administrative costs on all levels of public institutions required to collect the tax. At a minimum, the withholding requirement will require changes to be made to the accounting methods and software used by institutions.

In addition to the undue administrative burden, there is no new source of revenue to cover the increased costs of implementing withholding tax systems into accounts payable and vendor records, nor instructions on how to implement them. The requirement will also create a competitive disadvantage with the private sector, steer contractors away (particularly small businesses), and cause institutions to revise all contracts and awards.

Legislation (HR 5719) passed in the House on April 15 included a one-year delay on the 3% withholding tax which is to begin in 2011.

ASU supports a complete repeal of the 3% tax withholding on payments to vendors provision—not just a one year delay in its implementation.
SOLAR INVESTMENT TAX CREDIT EXTENSION

The current solar investment tax credit will revert from 30 percent to 10 percent at the end of 2008. The residential tax credit will expire at the end of 2008. ASU is supportive of extending the solar investment tax credit for an additional eight years.

This issue is important not just for the solar industry in Arizona (and the country) but for ASU specifically because we are hoping to use expanded solarization of Phoenix and Arizona as part of our demonstration that the university can help create more sustainable urban environments.

The Renewable Energy and Energy Conservation Tax Act (H.R. 5351) passed the House on February 27, 2008 and contains a section that would promote solar energy by extending through 2016 the 30% solar investment tax credit for individuals and businesses.

In addition, the tax credit is included in the legislation introduced by Senators Baucus and Grassley on April 17, 2008.

ASU supports extending the solar investment tax credit.
SENATOR PAUL SIMON STUDY ABROAD FOUNDATION

BACKGROUND

Last year in 2008, the Senator Paul Simon Study Abroad Foundation Act enjoyed strong, bipartisan support in both the House and Senate, passing the full House and the Senate Foreign Relations Committee without dissent. Ultimately, it was held up on the Senate floor as many worthy bills were. The bill would authorize a Foundation to increase the number of U.S. students studying abroad annually from approximately 220,000 today to one million within ten years. The legislation continues to have strong support in both chambers and ASU continues to support it.

The goal of the program is to create a more globally informed and competitive U.S. citizenry by significantly increasing the number of U.S. students who study abroad. This will be accomplished through an innovative federal-higher education partnership. The program would democratize and diversify study abroad participation so that America’s ethnic and socio-economic diversity is reflected abroad. It would send more students to non-traditional destinations, and encourage students of all disciplines to participate.

The authorization bill for this program is set at $80 million would be the full authorization and is currently under consideration in Congress.

FY10 REQUEST

ASU supports a $50 million authorization bill. The President’s Budget Request for FY10 was $0; since this is a new program with no prior funding in years past, there was no request from the administration.
Arizona State University is a member of the Coalition of Urban Serving Universities (USU), a national consortium of public universities dedicated to addressing critical issues confronting urban areas across the country.

ASU is active in supporting the legislative thrusts of the USU. We were very pleased the House included in the College Opportunity and Affordability Act of 2007 (HR 4137), language important to the consortium and ASU. We urge that the language be included in the final version of the HEA reauthorization which is anticipated to be taken up early in 2008.

Several very important “strands” are addressed in the authorization language. Consider the following from the College Opportunity and Affordability Act of 2007 HR 4137 — Committee Views:

“Our nation’s cities play an important role in America’s national prosperity, driving innovation and economic growth by employing many highly-skilled workers and containing clusters of related firms and industries. However, urban areas face many challenges unique to cities. Urban secondary schools experience a higher dropout rate than the national average and urban elementary and secondary students typically score below state and national averages on academic performance exams. Urban schools often encounter teacher shortages in high need subject areas such as mathematics and science. Particular neighborhoods are stricken with poverty and struggle to attract businesses and services. A greater percentage of their citizens are uninsured or underinsured.

As anchors for our nation’s cities, urban research universities are uniquely positioned with a broad range of skills and resources — intellectual, human, technological, and social to engage in these urban challenges. Serving as an essential part of the education pipeline by enrolling large numbers of students from local school districts and specifically training them to be educators in urban areas, urban research universi-
ties are economic drivers, as they serve as prominent employers, real estate developers, and business innovators in their cities. The community engagement by urban research universities not only provides a valuable service to the cities, but also enables these institutions to improve their own core knowledge and expertise that leads to further theories, discoveries, and advances for our nation.”

HR 4137 updates the Urban Community Service program to authorize competitive grants for urban research universities to expand their capacity to develop initiatives geared toward improving the communities in which they are located. This updated program will help to address the unique challenges of our nation’s urban communities by: enhancing teacher quality and college and workforce readiness (especially in the fields of science, technology, engineering, and mathematics); revitalizing the economies of local neighborhoods; and reducing the incidences of urban chronic diseases and health disparities. The Committee believes that supporting urban institutions of higher education in research and programmatic initiatives will help to address these challenges, bolster our nation’s economic competitiveness, and make our cities better places to live.

HR 4137 authorizes $50 million for FY2009 and such sums as are necessary for FY2010, FY2011, FY2012 and FY2013.

THE URBAN SERVING UNIVERSITIES CONSORTIUM

The USU is a not-for-profit, 501(c) 4 university president-driven organization that seeks to amplify America’s land grant tradition of higher education by strengthening the engagement of urban serving public research universities with the residents and organizations in America’s cities. USU believes that the key to revitalizing urban America is harnessing the knowledge and intellectual resources of urban-serving public research universities, in partnership with their communities and affiliate organizations, and directing them toward solving contemporary problems.

FY09 REQUEST

ASU supports passage of the HEA including the provisions found in the HR 4137, in the section (Sec. 706) entitled “Urban-Serving Research Universities.” In addition, we support an FY09 appropriation of $50 million to implement the language. As one of the largest urban universities in one of the fastest growing megapolitan areas in the country, ASU strongly supports this long overdue effort to address issues unique to urban areas.
FEDERAL FUND SOURCES BY AGENCY

Fiscal Year 2007 Sponsored Project Expenditures by Sponsor Type Compared to Fiscal Year 2006

Sponsored Project Expenditures Incurred by Sponsor Type, Fiscal Year 2007

Two-Year Comparison of Expenditures Incurred by Source

<table>
<thead>
<tr>
<th>Sponsor Type</th>
<th>FY2006</th>
<th>FY2007</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEDERAL: DOD-Air Force</td>
<td>$3,580,391</td>
<td>$4,315,874</td>
<td>20.54%</td>
</tr>
<tr>
<td>FEDERAL: DOD-Army</td>
<td>$12,701,046</td>
<td>$11,258,033</td>
<td>−11.36%</td>
</tr>
<tr>
<td>FEDERAL: DOD-Navy</td>
<td>$3,486,425</td>
<td>$3,194,051</td>
<td>−8.39%</td>
</tr>
<tr>
<td>FEDERAL: DOD-Other</td>
<td>$1,993,243</td>
<td>$3,837,351</td>
<td>92.52%</td>
</tr>
<tr>
<td>FEDERAL: DOE</td>
<td>$4,428,545</td>
<td>$4,278,260</td>
<td>−3.39%</td>
</tr>
<tr>
<td>FEDERAL: DOEd</td>
<td>$15,840,588</td>
<td>$13,201,513</td>
<td>−16.66%</td>
</tr>
<tr>
<td>FEDERAL: DOI</td>
<td>$937,635</td>
<td>$1,161,652</td>
<td>23.89%</td>
</tr>
<tr>
<td>FEDERAL: DOT</td>
<td>$529,070</td>
<td>$352,549</td>
<td>−33.36%</td>
</tr>
<tr>
<td>FEDERAL: EPA</td>
<td>$1,817,909</td>
<td>$2,178,821</td>
<td>19.85%</td>
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<tr>
<td>FEDERAL: HHS-NIH</td>
<td>$35,148,635</td>
<td>$35,070,159</td>
<td>−0.22%</td>
</tr>
<tr>
<td>FEDERAL: HHS-Other</td>
<td>$5,923,896</td>
<td>$6,938,473</td>
<td>17.13%</td>
</tr>
<tr>
<td>FEDERAL: NASA</td>
<td>$11,633,925</td>
<td>$12,324,291</td>
<td>5.93%</td>
</tr>
<tr>
<td>FEDERAL: NEA</td>
<td>$74,971</td>
<td>$47,046</td>
<td>−37.25%</td>
</tr>
<tr>
<td>FEDERAL: NEH</td>
<td>$247,163</td>
<td>$250,551</td>
<td>1.37%</td>
</tr>
<tr>
<td>FEDERAL: NSF</td>
<td>$39,168,172</td>
<td>$39,973,863</td>
<td>2.06%</td>
</tr>
<tr>
<td>FEDERAL: Other</td>
<td>$3,233,872</td>
<td>$3,396,219</td>
<td>5.02%</td>
</tr>
<tr>
<td>FEDERAL: USDA</td>
<td>$1,630,249</td>
<td>$1,368,045</td>
<td>−16.08%</td>
</tr>
</tbody>
</table>

Total Federal       $142,375,734 | $143,146,752 | 0.54%
Two-Year Comparison of Expenditures Incurred by Source (continued)

<table>
<thead>
<tr>
<th>Sponsor Type</th>
<th>FY2006</th>
<th>FY2007</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOREIGN: Foundation (Corporate)</td>
<td>$4,046</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOREIGN: Foundation (Private)</td>
<td>$122,641</td>
<td>$161,842</td>
<td>31.96%</td>
</tr>
<tr>
<td>FOREIGN: Government</td>
<td>$102,009</td>
<td>$178,946</td>
<td>75.42%</td>
</tr>
<tr>
<td>FOREIGN: Industry</td>
<td>$264,458</td>
<td>$897,786</td>
<td>239.48%</td>
</tr>
<tr>
<td>FOREIGN: Other</td>
<td>$1,002,991</td>
<td>$1,293,917</td>
<td>29.01%</td>
</tr>
<tr>
<td>LOCAL: Arizona Municipal Government</td>
<td>$1,322,242</td>
<td>$863,665</td>
<td>-34.68%</td>
</tr>
<tr>
<td>LOCAL: Arizona School District</td>
<td>$354,687</td>
<td>$691,622</td>
<td>95.00%</td>
</tr>
<tr>
<td>LOCAL: Indian Tribal Government Unital Units</td>
<td>$120,204</td>
<td>$39,749</td>
<td>-66.93%</td>
</tr>
<tr>
<td>PRIVATE: Foundation (Corporate)</td>
<td>$238,530</td>
<td>$173,299</td>
<td>-27.35%</td>
</tr>
<tr>
<td>PRIVATE: Foundation (Private)</td>
<td>$5,722,573</td>
<td>$6,532,049</td>
<td>14.15%</td>
</tr>
<tr>
<td>PRIVATE: Individual</td>
<td>$17,277</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRIVATE: Industry</td>
<td>$10,641,014</td>
<td>$12,466,702</td>
<td>17.16%</td>
</tr>
<tr>
<td>PRIVATE: Non-Arizona State/Local Agency</td>
<td>$124,328</td>
<td>$171,020</td>
<td>37.56%</td>
</tr>
<tr>
<td>PRIVATE: Non-Arizona University</td>
<td>$1,401,421</td>
<td>$1,275,561</td>
<td>-8.98%</td>
</tr>
<tr>
<td>PRIVATE: Organization</td>
<td>$5,757,965</td>
<td>$6,427,855</td>
<td>11.63%</td>
</tr>
<tr>
<td>PRIVATE: Various Consortium Members</td>
<td>$102,394</td>
<td>$102,312</td>
<td>-0.08%</td>
</tr>
<tr>
<td>PROGRAM INCOME: Endowment Income</td>
<td>$293,819</td>
<td>$278,936</td>
<td>-5.07%</td>
</tr>
<tr>
<td>PROGRAM INCOME: Investment Income</td>
<td>$10,548</td>
<td>$58,432</td>
<td>453.98%</td>
</tr>
<tr>
<td>PROGRAM INCOME: Sales</td>
<td>$305,656</td>
<td>$347,998</td>
<td>13.85%</td>
</tr>
<tr>
<td>STATE: Arizona State Government</td>
<td>$4,381,459</td>
<td>$6,814,040</td>
<td>55.52%</td>
</tr>
</tbody>
</table>

Total Non Federal: $32,268,937 \(\text{FY2006}\) \(\text{FY2007}\) 20.23%

University Total: $174,644,672 \(\text{FY2006}\) \(\text{FY2007}\) 4.18%
ASU FUND SOURCES 2007

IN MILLIONS

State appropriations: $429.6 million (30%)
Tuition and fees, gross: $479.6 million (33%)
Grants and contracts: $219.0 million (15%)
Auxiliary enterprises: $118.2 million (8%)
Private gifts: $49.2 million (4%)
TRIF: $31.6 million (2%)
Other sources: $110.4 million (8%)

Total: $1,437.6 million
ASU FUND USES 2007
IN MILLIONS

- Instruction and academic support: $575.0 million (41%)
- Research and public service: $187.8 million (14%)
- Student services & institutional support: $162.9 million (12%)
- Auxiliary enterprises: $113.4 million (8%)
- Depreciation: $78.1 million (6%)
- Operation and maintenance of plant: $83.3 million (6%)
- Scholarships & fellowships, gross: $142.9 million (10%)
- Other uses: $46.8 million (3%)

Total: $1,390.2 million