FIVE YEAR STRATEGIC PLAN
2009-2013
The University of Arizona
Five Year Strategic Plan
2009-2013
EXECUTIVE SUMMARY

The mission of The University of Arizona is to improve life for the people of Arizona and beyond through education, research, creative expression and community engagement.

VISION
As a premier land-grant university, The University of Arizona plays a vital role in building a thriving state. The University offers the highest quality education, excels in creating new knowledge that has worldwide impact, and provides leadership and collaboration to address the challenging issues facing Arizona, the nation and the world. The University is about quality, discovery, and opportunity. To better serve future generations, The University of Arizona will be one of the 10 best public research universities.

THE PRIORITIES THAT GUIDE US
Academic Excellence: The University of Arizona must be a center for excellence in education and research. We must put people first. Our focus must always be on serving our students and supporting our faculty, professionals, and staff. An outstanding faculty is the foundation for academic excellence, attracting and educating the best undergraduate, graduate, and professional students. Recruiting, retaining, and supporting outstanding scholar/teachers is our highest priority.

Access and Success: An education at The University of Arizona must prepare students for a productive future and must be accessible to all who are academically qualified. Economic or social status cannot be a barrier. The University must engage, retain, and graduate its students in the greatest numbers possible.

Quality of Life and Societal Impact: In keeping with the University’s land-grant mission, The University of Arizona must serve as an engine for economic development and as a source of inspiration that enriches individual lives and advances the collective wellbeing of our society. Across every discipline, and on a daily basis, the University is improving the human condition for the people of Arizona.

STRATEGIC PLANNING PROCESS:
In order to achieve our mission, vision and priorities, the UA has identified 4 major strategies. We have taken into account key elements of the context within which we function, the needs of the state of Arizona and the views of numerous internal and external stakeholders (through focus groups and individual interviews) regarding the strengths of the UA and the unique opportunities available to us. Key factors include: the extraordinary population growth anticipated for Arizona and the needs of the state for an educated citizenry; the diversity of our students in terms of cultural and socioeconomic background and academic preparation; the financial constraints within which we must function, especially the unusually limited support for financial aid provided by the state (in Arizona only 2.4% of freshman receive financial aid directly from the state compared with 27% nationally); the educational imperatives of ever increasing economic and cultural globalization; and the challenges Arizona is facing with regard to the health care and natural resources. We also recognized that we must build on our current strengths in interdisciplinary scholarship in general and in particular fields including but not
limited to space exploration, water and environmental resources, biosciences and biotechnology, and Native American Studies. Further, we must develop the unique opportunities afforded by our geographic location in the desert and on the US-Mexico border.

STRATEGIC DIRECTIONS

Prepare Arizona’s Youth and Ensure Access and Opportunity
We will collaborate with educational partners (P-14) to prepare students for University success and support education in Arizona by preparing more teachers (especially in STEM fields), targeting underserved areas first. We will improve access by increasing enrollments and financial aid (both need and merit-based). And we will serve our growing student population by providing integrated state-of-the-art technological support.

Engage and Graduate Students Who Can Contribute to the State, Nation, and World
We will educate all of our students to become creative, productive and engaged members of society by providing solid grounding in core skills, broad knowledge across disciplines, expertise in areas of special focus, and the ability to evaluate, integrate, and generate new knowledge. And we will respond to the state’s shortages of health care providers by expanding educational programs in those high priority areas. In doing so, we will expand course and major availability, improve retention and graduation rates, and improve our communications infrastructure.

Provide World-Class Research That Improves the Human Condition in Arizona and Beyond
We will build on our national leadership in interdisciplinary and collaborative research and lead the nation in research and outreach activities that are critical to our state’s future, with particular emphasis on the following areas:

- Climate, Environmental, Water and Energy Sustainability
- Southwest, Native American, Borderlands, and Latin American Studies
- Biosciences and Biotechnology
- Optics
- Space Exploration and Observation
- Creative Arts, Languages and Language Acquisition
- Law, Public Policy and Entrepreneurship
- Biomedical and Behavioral Health
- Youth Development Programs

Partner With and Serve the People of Arizona
We will contribute to the richness and vibrancy of the community, serve as an incubator and magnet for talent, develop partnerships with public, private and non-profit sector organizations, and share research with and provide direct services to the people of Arizona through technology transfer, Cooperative Extension programs, development of the Phoenix Biomedical Campus and provision of clinical health care services throughout the state.
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PLANNING CONTEXT

Demographic, economic, and social factors: Arizona’s population is expected to double in the next 30 years. Growth in the Hispanic population will be even more dramatic, especially the college-age population.
Implications: The University of Arizona must grow. It must excel at recruiting, retaining, educating and graduating an increasingly diverse student body.

While agriculture and mining remain important aspects of Arizona’s economy, the state’s economy increasingly depends on knowledge, information, and creativity, and on a well-educated citizenry. As a consequence, the less educated are falling farther behind the well-educated. This gap will widen if education cannot be made accessible and effective for all our citizens, regardless of their economic or social status.
Implications: The University of Arizona must ensure that all qualified students have access to the same educational opportunities, regardless of their means.

The University student body has changed in recent years. There is now a much broader spectrum of student preparation, from best to weakest, coming out of K-12 systems. Many students today have jobs or other responsibilities in addition to their university studies. 

Implications: In order to serve this broad spectrum of student, the University of Arizona must strengthen its infrastructure to make the university’s educational experience successful for them without compromising excellence.

The University’s financial environment: Arizona, like most states, is financing an ever-smaller share of its state universities with state funds, increasingly shifting the cost of the educational enterprise to tuition and gifts. To ensure access in the face of tuition increases, most states have increased need-based financial aid. Arizona is an outlier: in 2003-04 only 2.4% of Arizona’s freshman university students received direct financial aid from the state; in California the figure is 23%, nationally it is 27%.

Implications: This is perhaps the greatest challenge facing Arizona’s system of higher education. In conjunction with ASU and NAU, we must continue to work with the Regents and the legislature to achieve a more strategically satisfactory level of state-funded financial aid. The University must also redouble its efforts to secure private funding of student financial assistance.

Competition for the best students and faculty members has intensified in the last ten years. Private universities and many state universities as well, have vastly increased their endowments since the late 1990s, fueling the competition. There is also greater competition for the grants and contracts that form an increasing portion of universities’ budgets, while the funding available in this domain is expected to grow only marginally.

Implications: The University of Arizona must become more competitive and entrepreneurial in everything it does, increasing both its endowment and external support for its research. It must manage its resources wisely and strategically.

An increasingly global future: Education today must prepare students to become not just citizens of Arizona but also citizens of the world. The ability of Arizonans to adapt to change and to work with people from all parts of the world will increasingly be critical for individual success and to Arizona’s economic success.

Implications: The University of Arizona must provide students with a foundation for a lifetime of learning. The university must increase students’ abilities to understand and work with people from other cultures, from Latin America to the Pacific Rim to Europe and the Middle East. We must take full advantage of our location on the US-Mexico border. And we must develop the diverse faculty that is essential to achieving this objective.

Health care: Prospects for the health and well-being of Arizona’s residents are increasingly threatened by the cost of health care and its implications for access. Arizona faces its own unique set of health-related issues: one of the nation’s fastest growing populations; a large retiree population; a rapidly growing, under-served, low-income population; and special health concerns of our Native American population.
Implications: As part of its land-grant mission, and with the state’s only public medical school, the University of Arizona must address these issues by educating increasing numbers of healthcare providers and by investing in biomedical and public health research.

**Natural resources and the environment:** One of Arizona’s greatest challenges in the twenty-first century will be to maintain economic growth and quality of life in the face of increasing environmental constraints.

Implications: The University of Arizona’s strengths in water, environmental science, energy and sustainable engineering practices must be mobilized to meet the challenges of growth.

**Building on strengths:** The University of Arizona must maintain and build upon its existing strengths. These include our widely recognized strength in fostering interdisciplinary activities, as well as specific areas of excellence related to our location in the desert southwest. Our long-distinguished programs in astronomy, lunar and planetary science, anthropology, water and environmental sciences, and Native American studies are founded on unique features of our geography and history. Additional strengths have been developed in other areas, such as optical sciences, biological sciences and biotechnology, psychology, communications, management information systems, and border studies.

Implications: The University must build on its existing strengths, while maintaining the flexibility to take advantage of new opportunities. These areas of excellence will be central to our ability to maintain and enhance our position as a leading research university in the twenty-first century.

**Resource Assumptions**

- Support for the development of programs and initiatives outlined in this plan rests on a multifaceted financial base. At its core, resources and progress on the initiatives outlined in this plan will be defined by the ability of the state to provide adequate resources for student growth while maintaining program quality and breadth.

- While substantial growth of the state population is anticipated, missions will be differentiated between institutions with the University of Arizona providing high quality baccalaureate and graduate degree programs, cutting edge research and a special obligation to provide statewide outreach programs as Arizona’s land grant university.

- In developing our plans, future tuition rates for resident undergraduates are expected to increase relative to the top of the bottom one-third of the fifty flagship public universities, in accordance with current ABOR policy. Also as provided by Board policy, the university may pursue differential tuition and/or special program fees for targeted academic programs that meet policy standards.
• In establishing future tuition rates, the University is mindful of the need to ensure adequate financial aid is made available to students with financial need. Arizona is challenged as it lags virtually all other states in the amount of state-based financial aid for its residents.

• New research facilities completed in FY 2007 provide enormous benefit to the university and in our ability to attract outstanding researchers and do groundbreaking research. This provides an advantage when increasing competition for federal funding and budget cutbacks at the National Institutes of Health (NIH) have slowed the historical growth rates of grant and contract revenue. As new Phoenix-based faculty and facilities grow, university research strength and competitiveness and will broaden.

• Resources needed in order to catch University salaries up to our benchmark peers are projected to be developed over the five-year planning period and assumes that our next State appropriations will, at a minimum, cover those increases.

• Strategic alignment of development activities and partnerships with the University mission will be a key factor in extending the base of support needed to sustain our instructional, research, and outreach excellence.

### Funding and FTE Budget Summary

<table>
<thead>
<tr>
<th></th>
<th>FY 2008 Estimate (thousands)</th>
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<tbody>
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<tr>
<td>Other Non-appropriated Funds</td>
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<td>Federal Funds</td>
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<tr>
<td>Program Total</td>
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<tr>
<td>Total State FTE Employees</td>
<td>6,635.0</td>
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</tbody>
</table>
STRATEGIC DIRECTIONS

I. PREPARE ARIZONA’S YOUTH & ENSURE ACCESS AND OPPORTUNITY

A. Collaborate with educational partners (P-14) to prepare students early and continuously for University success

B. Certify 5% more teachers each year, targeting underserved areas first
   1. Scale-up professional teacher preparation statewide by expanding alternative delivery models and hiring additional faculty
   2. Recruit and retain prospective teachers by increasing our financial support and by establishing STEM Teachers for Arizona, which will expand and leverage existing resources to attract students to become STEM teachers

C. Increase need and merit-base financial aid by establishing the Arizona Assurance program and by doubling the number of endowed scholarships for undergraduates
   1. The Arizona Assurance financial aid program will improve access to an outstanding university education by providing a comprehensive financial aid package to some of our neediest Arizona resident students.
   2. To improve our ability to recruit highly qualified students, we will develop more than 80 new endowed scholarships by 2013.

D. Increase undergraduate and graduate enrollments to reflect the growth and diversity of the state.
   1. Increase enrollment of new freshman and transfer students by 200 per year, while maintaining the quality of our student body.
   2. Increase graduate enrollment such that, by 2013, graduate and first professional students will comprise 25% of the student body.
      a. To achieve this increase and successfully compete for the highest quality graduate students, we will increase the number and level of stipends and other benefits to be competitive with our peers; and we will develop 200 new graduate fellowships supported by gifts and endowments
   3. Increase student diversity and support for enrolled traditionally underrepresented students.
      a. Increase enrollment of new freshman and transfer students from traditionally underrepresented groups.
      b. Make substantial progress towards becoming a federally recognized Hispanic Serving Institution.

E. Improve our ability to serve our growing student population by providing technological support services that are integrated and state-of-the-art as described in the UA IT Strategic Plan Goal 1 (see Appendix B).
### Incremental Costs; constant/nominal dollars; in thousands

<table>
<thead>
<tr>
<th></th>
<th>FY 2009</th>
<th>FY 2010</th>
<th>FY 2011</th>
<th>FY 2012</th>
<th>FY 2013</th>
</tr>
</thead>
<tbody>
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<td>Federal Funds</td>
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<td>2,422.5</td>
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<tr>
<td>Full-time Equivalent</td>
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<td>118.3</td>
<td>128.6</td>
<td>139.6</td>
<td>155.7</td>
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<td>17,996.1</td>
<td>19,323.7</td>
<td>21,247.7</td>
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</table>
Percent of Financial Need Met

FY 2013 est: 67%
FY 2012 est: 67%
FY 2011 est: 66%
FY 2010 est: 66%
FY 2009 est: 65%
FY 2008 est: 65%
FY 2007: 64%
FY 2006: 63%
FY 2005: 62%
FY 2004: 63%
FY 2003: 62%

Source: Financial Aid

Total Enrollment

FY 2013 est: 43,850
FY 2012 est: 42,431
FY 2011 est: 40,877
FY 2010 est: 39,235
FY 2009 est: 38,156
FY 2008: 37,217
FY 2007: 36,805
FY 2006: 37,036
FY 2005: 36,932
FY 2004: 37,083
FY 2003: 36,847

Source: Enrollment Research
Average SAT of Incoming Freshmen

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<td>1,122</td>
<td>1,110</td>
<td>1,115</td>
<td>1,122</td>
<td>1,130</td>
<td>1,130</td>
<td>1,134</td>
<td>1,139</td>
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</table>

Source: Enrollment Research
II. ENGAGE & GRADUATE STUDENTS WHO CAN CONTRIBUTE TO THE STATE, NATION AND WORLD

A. Educate students to become creative, productive and engaged members of society by providing solid grounding in core skills, broad knowledge across disciplines, expertise in areas of special focus, and the ability to evaluate, integrate, and generate new knowledge.
   1. Enrich the educational environment by recruiting, rewarding and retaining excellent faculty at all ranks who are committed to both teaching and research.
   2. Enhance international, and especially cross-border, educational programs and partnerships to ensure that UA students have broad exposure to the political, social, cultural and economic challenges of the 21st century.
   3. Increase faculty diversity.

B. Improve freshman-sophomore retention and 6-year graduation rates overall and for traditionally underrepresented students by 5%.
   1. Enrich and revise our practices in support of retention and graduation based on the results of assessment instruments (such as NSSE, student exit surveys, etc.).
   2. Improve the coordination of early outreach, recruitment, admissions, articulation, curriculum planning, orientation and advising towards increasing retention from the earliest stages of the university’s engagement with students.

C. Expand course availability and access to majors to reflect planned enrollment growth
   1. Target growth in faculty to reflect student need as well as opportunities for academic excellence.
   2. Develop mechanisms to assure increased access to high-demand, high-quality courses through UA South and UA Continuing Education
   3. Provide the tools and technologies needed for alternative delivery of courses, online learning spaces and collaborative learning models as described in the UA IT Strategic Plan Goal 1 (see appendix B).

D. Respond to the state’s shortages of health care providers
   1. Increase BSN graduates from the College of Nursing Accelerated Partnership Program to 100 in 2009, for a college-wide total of 200 per year, (a 100% increase over 2002 as recommended in Senate Bill 1260); and, in 2009, begin to graduate students from our new Doctorate of Nursing Practice Program.
   2. Increase the number of pharmacists graduated from the Tucson campus by 5% per year; and, by expansion of the College of Pharmacy to Phoenix, increase our pharmacy enrollment by an additional 15% by 2013.
   3. Increase the enrollment of medical students by 20% per year, for a total increase of 150 students by 2013, through expansion of CoM Phoenix
E. Enable faculty and students to interact at the highest and most collaborative level possible by improving the communications infrastructure as described in the UA IT Strategic Plan Goal 3 (see appendix B).

<table>
<thead>
<tr>
<th>Incremental Costs; constant/nominal dollars; in thousands</th>
<th>FY 2009</th>
<th>FY 2010</th>
<th>FY 2011</th>
<th>FY 2012</th>
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<td>Federal Funds</td>
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<tr>
<td>Full-time Equivalent</td>
<td>274.5</td>
<td>187.9</td>
<td>202.4</td>
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<td>Strategic Issue Total Funds</td>
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Percent of Graduate & First Professional Students Enrolled

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<tr>
<th>Year</th>
<th>Percent</th>
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<tbody>
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</tr>
<tr>
<td>FY 2012 est</td>
<td>25.0</td>
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<td>FY 2011 est</td>
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<td>FY 2010 est</td>
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<td>FY 2009 est</td>
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<td>FY 2008 est</td>
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<td>FY 2007</td>
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<td>FY 2006</td>
<td>22.7</td>
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<td>FY 2005</td>
<td>23.2</td>
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<td>FY 2004</td>
<td>23.2</td>
</tr>
<tr>
<td>FY 2003</td>
<td>23.2</td>
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</tbody>
</table>

Source: Common Data Set

Masters & First Professional Degrees Awarded

<table>
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<tr>
<th>Year</th>
<th>Degrees Awarded</th>
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<td>FY 2012 est</td>
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<td>FY 2011 est</td>
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<td>FY 2010 est</td>
<td>1,911</td>
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<td>FY 2009 est</td>
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<td>FY 2008 est</td>
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<td>FY 2007</td>
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<td>1,790</td>
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<td>FY 2003</td>
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</table>

Source: Enrollment Research
Number of Students Involved in Outward Bound, Study Abroad or Exchange Programs

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<tr>
<th>Year</th>
<th>Number of Students</th>
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<td>FY 2010 est</td>
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<td>FY 2009 est</td>
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<td>FY 2008 est</td>
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<td>FY 2007</td>
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<tr>
<td>FY 2006</td>
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<td>FY 2004</td>
<td>1,507</td>
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<tr>
<td>FY 2003</td>
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Source: International Affairs

Percent of Ranked Faculty who Self-Identify in an Ethnic Minority Group

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<th>Year</th>
<th>Percent</th>
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</tr>
<tr>
<td>FY 2012 est</td>
<td>20</td>
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<tr>
<td>FY 2011 est</td>
<td>19</td>
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<tr>
<td>FY 2010 est</td>
<td>18</td>
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<tr>
<td>FY 2009 est</td>
<td>18</td>
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<td>FY 2008 est</td>
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<tr>
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<tr>
<td>FY 2006</td>
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<td>FY 2005</td>
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<tr>
<td>FY 2004</td>
<td>15</td>
</tr>
<tr>
<td>FY 2003</td>
<td>14</td>
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</tbody>
</table>

Source: Human Resources
Percent of Ranked Faculty Who are Women

- FY 2013 est: 33%
- FY 2012 est: 33%
- FY 2011 est: 32%
- FY 2010 est: 32%
- FY 2009 est: 31%
- FY 2008 est: 31%
- FY 2007: 30%
- FY 2006: 30%
- FY 2005: 29%
- FY 2004: 29%
- FY 2003: 28%

source: Enrollment Research
III. PROVIDE WORLD-CLASS RESEARCH THAT IMPROVES THE HUMAN CONDITION IN ARIZONA AND BEYOND

A. Build on our national leadership in interdisciplinary and collaborative research
   1. Expand our infrastructure and increase our funding of interdisciplinary projects and programs across the university
      a. Actively identify emerging scholarly areas worthy of investment
      b. Ongoingly improve processes and incentives to maximize collaborative and interdisciplinary research and teaching
   2. Establish the expectation that all academic leaders will engage in ongoing review of the current structure of disciplines and departments to identify possibilities for innovative collaboration and reorganization.

B. Lead the nation in research and outreach activities that are critical to our state’s future:
   1. Climate, Environmental, Water and Energy Sustainability
   2. Southwest, Native American, Borderlands, and Latin American Studies
   3. Biosciences and Biotechnology
   4. Optics
   5. Space Exploration and Observation
   6. Creative Arts, Languages and Language Acquisition
   7. Law, Public Policy and Entrepreneurship
   8. Biomedical and Behavioral Health
   9. Youth Development Programs

C. Support the creation of new knowledge by increasingly and effectively securing our information assets and intellectual property as described in the UA IT Strategic Plan Goals 4, 5, & 6 (see Appendix B).

<table>
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<tr>
<th>Incremental Costs; constant/nominal dollars; in thousands</th>
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<th>FY 2011</th>
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source: National Science Foundation
IV. PARTNER WITH AND SERVE THE PEOPLE OF ARIZONA

A. Contribute to the richness and vibrancy of the community by providing cultural, artistic and athletic events.

B. Serve as an incubator and magnet for talent. Increase our endowment, and specifically, increase to 100 the number of endowed chairs, to ensure that we serve Arizona with the best people and programs.

C. Develop partnerships with public, private and non-profit sector organizations locally and throughout Arizona.

D. Share research with and provide direct services to the people of Arizona
   1. Enhance technology transfer and incubation of spin-off businesses
   2. Share expertise through Cooperative Extension programs
   3. Develop the Phoenix Biomedical Campus to bring the University’s research and medical expertise to Arizona’s largest population center, while continuing to develop and strengthen the Arizona Health Sciences programs in Tucson.
   4. Expand clinical health care services throughout the state through telemedicine and other programs
      a. Leverage TRIF-funded activities in support of our application for the state-wide Clinical and Translational Science Award to disseminate translational and clinical research, education and best practices in clinical care throughout the state.

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<tr>
<th>Incremental Costs; constant/nominal dollars; in thousands</th>
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*Historical data have been revised to reflect recent reporting improvements*

*People Served By Arizona Telemedicine*

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*source: College of Agriculture and Life Sciences*

*source: Arizona Telemedicine Program*
Number of Office of Technology Transfer & Entrepreneurial Start-ups

FY 2013 est: 13
FY 2012 est: 13
FY 2011 est: 12
FY 2010 est: 11
FY 2009 est: 10
FY 2008 est: 10
FY 2007: 8
FY 2006: 8
FY 2005: 7
FY 2004: 6
FY 2003: 3

Source: Vice President for Research

Number of Endowed Chairs

FY 2013 est: 100
FY 2012 est: 90
FY 2011 est: 83
FY 2010 est: 77
FY 2009 est: 73
FY 2008 est: 69
FY 2007: 67
FY 2006: 65
FY 2005: 62
FY 2004: 56
FY 2003: 50

Source: The University of Arizona Foundation
source: The University of Arizona Foundation
PROJECT STATUS AND BUILDING NEEDS MAP
The University of Arizona  October 2007

Appendix A

Deferred Maintenance Dollars Required Per Building

- $0 - $100K
- $100K - $500K
- $500K - $1M
- $1M - $5.2M
- Demolish

Note: Map background shows an illustrative build-out concept of campus development (the Campus Comprehensive Plan - ABOR 2002).

Deferred maintenance dollars per building based on most current available data submitted to ABOR in the September 2007 CIP.
Appendix B
The University of Arizona
Information Technology Strategic Plan
2008 - 2012

BACKDROP: UA MISSION AND PRIORITIES

The University of Arizona, a public, land-grant, research institution, is dedicated to preparing students for an increasingly diverse and technological world, and to improving the quality of life for the people of Arizona and the nation. The University provides distinguished undergraduate, graduate and professional education; excels in basic and applied research and creative achievement; and integrates these activities and achievements of regional, national and international significance into everyday life.

The University of Arizona’s four major strategic directions are as follows:

1. Prepare Arizona’s youth & ensure access and opportunity
2. Engage & graduate students who can contribute to the state, nation and world
3. Provide world-class research that improves the human condition in Arizona and beyond
4. Partner with and serve the people of Arizona

POSITIONING INFORMATION TECHNOLOGY WITHIN THE UA MISSION

The University of Arizona is complex in both its organization and its technology, requiring that competing information technology needs be carefully evaluated and deployed to ensure the optimal investment of limited resources. In January 2007, the UA adopted a process to develop a university-wide information technology strategic plan. The UA Information Technology Strategic Plan supports the University’s Five Year Strategic Plan, but also stands to represent a comprehensive and dynamic blueprint that will serve as a foundation for future plans.

The purpose of the University of Arizona IT Strategic Plan is to:

- Present the guiding principles for developing and managing information technology at the University of Arizona.
- Identify the most important IT Strategic Initiatives that UA must address in the next five years in order to survive and thrive.
- Provide a prioritized list of initiatives and operational improvements to address the IT opportunities and challenges.
- Provide the pathway to provide faculty, staff, and students with the latest technology tools for leadership in teaching, research, and career development.
- Position UA to equal or surpass our peer institutions in the use of technology for teaching, learning, research and overall effectiveness.

The planning process was led by George Davis, the Executive Vice President & Provost, and Michele Norin, the Executive Director for Central IT Units. The
development process for this IT Strategic Plan involved a series of discussions and input-gathering sessions with university stakeholders, including the Dean’s Information Technology Council (DITC). This information technology strategic plan is a living document. We will continue to define our technological directions and establish our plan.

AN OVERVIEW OF INFORMATION TECHNOLOGY AT THE UA

The current computing environment at the University of Arizona is both centralized and distributed. Expressions of the centralized dimensions include a CIO in direct reporting relationship to the Executive Vice President and Provost; a central Information Technology Policy Group (ITPG), chaired by the CIO, and reporting to the Provost and President; Central IT (CCIT, LTC, OSCR) reporting directly to the CIO, with responsibilities of network, telecommunications, security, learning technologies, student computing, major systems development, etc. Expressions of distributed dimensions are multiple advisory committees, college and departmental IT officers, IT research hubs within programs and centers, etc. Managing and supporting technology is a significant endeavor with a university-wide effort of nearly 700 University employees whose primary occupation is providing technology services. For reasons that are importantly related to the sheer complexity of a modern research university, the structure of information technology is distributed across a wide variety of advisory committees, academic departments, and administrative units. The University’s Information Technology Policy Group (ITPG) serves as the executive level decision point for strategic directions, policy development, and project review.

The UA possesses a first-class technology infrastructure and staff. There are many examples of excellent IT service delivery and expert project management approaches to IT throughout the university. The challenge is to weave these best practices into a transparent and comprehensive process for reaching university-level IT funding decisions while ensuring a set of common minimal service standards for all units and departments.

INFORMATION TECHNOLOGY MARKERS OF EXCELLENCE

The ability to provide advanced information technology helps the UA achieve its teaching, research, and public service mission - to discover, educate, serve, and inspire. Enhancing the current information technology environment with seamless simplicity, robust and secure technology, and greatly expanded capability will strengthen the University’s academic excellence, intellectual creativity, and spirit of community. To that end, we will move forward, as a university, with the following basic objectives which directly impact the mission of the University of Arizona.

- Eliminate as much redundancy as is possible and sensible
- Look for solutions, programs and partnerships that are cost effective
- Find ways of utilizing all university IT resources, including Arizona University System resources, more efficiently and collaboratively
- Recognize security as a common element within everything we do
With these objectives in mind, the University of Arizona has identified the following critical strategic statements:

**Services and Infrastructure**

The UA is an engine of discovery and advancement for society. Our IT services and infrastructure must support this vital role in all ways possible. University wide applications, systems, communications, devices and classroom technologies must be integrated, accessible, and as easy to use as possible. Essential connectivity for the entire University, with basic standards of support, must be ensured so that all University constituents are able to communicate, collaborate, learn and disseminate, within and across disciplines and campus borders.

**Security and Access**

The University’s information technology infrastructure and information environment must be stable, safe and secure. The institution must focus on making the environment more secure while maintaining the kind of access required of an open research-oriented university. Balancing security and access poses one of the greatest challenges to our ability to achieve our IT strategic vision.

**Leadership, Funding and Governance**

University priorities must drive information technology strategies and investments. Measuring progress and performance, while evaluating the quality of information technology, is essential and must be continuously pursued. The UA must establish an improved information technology governance model to provide a clear framework for ongoing dialogue, collaboration, and coordinated decision-making within the university, and within the larger system. At the heart of the governance and leadership model must be just the right proportionality of centralized and distributed IT. Decision making must be driven by vital mission objectives.
SERVICES AND INFRASTRUCTURE

The University’s computing and storage infrastructure must keep pace with the demands for reliable, interoperable and scalable capacity. The UA community increasingly relies on systems for administration, collaboration, communication, computation, learning and reporting. Computing facilities, data storage systems, middleware and systems integration services are crucial components on which application systems and IT services are built.

Goal 1: The university-wide information technology infrastructure must become more accessible, dependable, secure, flexible and scalable with services and tools that are integrated and state-of-the-art to meet the teaching, learning, research, and organizational needs of the University of Arizona and the surrounding community.

Actions:

- Define and publish a blueprint with minimum standards for common computing environments, such as metadata standards for core research areas. This may involve participation in similar national efforts.
- Provide standard online, real-time collaboration environments accessible from multiple departments, campuses, and private enterprise. This should include new learning tools and learning spaces that support multilevel interactions among students, instructors, and other academic partners.
- Provide options for storing very large data sets that can be actively accessed by multiple groups.
- Provide sufficient networking and computing resources to enable access to remote high-performance computing environments.
- Provide high-throughput computing and sophisticated visualization, simulation, and modeling software.
- Define minimum levels of service and connectivity for faculty and students across all fields of study.
- Develop a single university log-on for desktop computers for all students, faculty and staff, including discipline specific resources.
- Continue the development of a federated identity management project (ATIF) between the three state universities.
- Optimize computing and storage investments by consolidating services where appropriate.
- Improve technological collaborations with ASU and NAU as well as Arizona’s community colleges to facilitate interactions and build synergies that strengthen each University and the system as a whole.
- Develop infrastructure and processes for collaborative development of common solutions across units. This should include the consolidation of existing systems and evaluation of localized management.
- Support a mobile computing environment that allows students to manage effectively with one computer.
• Identify a technology education, training, and information technology literacy program to improve the skills of students, faculty, and staff in the use of computers, software, databases, and other technologies. Particularly for students, the range of literacy must be broad, encompassing both baseline needs to high-end discipline-specific specialty software, hardware, and peripherals.
• Ensure opportunities and resources are available for the exploration of new and emerging technologies.

There is an ever-increasing need for accurate, integrated information not limited by existing functional boundaries. Having the ability to address this need is restricted by some systems that are technologically out of date. Legacy administrative systems are surrounded by extensions, augmentations, and supplemental distributed systems maintained by Central IT, individual vice presidential areas, individual departments, and other operating units. There is no controversy at all over the need to significantly improve the entire suite of administrative systems, e.g., registration, and billing, to achieve greater efficiencies and decreased overhead. With certain administrative systems in need of attention and growing dependencies, the institution is identifying solutions for improving and modernizing the UA’s administrative systems. For example, “Legacy Extension” is providing increasingly viable interfaces to systems that are now thriving, e.g., admissions, and financial aid. Our participation in Kuali, an open source movement to modernize existing administrative software specifically for higher education, will allow us to replace our grants management system and potentially our financial system. A similar effort, the UA’s Human Resources Application Architecture (HRAA) project, is underway to identify the foundational changes needed on the Personal Services and Payroll system.

**Goal 2: Business operations must be supported with tools and applications that are flexible, responsive, permit real-time web access, facilitate self-help, and ensure information integrity. The applications must be interoperable, modern and poised for future changes.**

**Actions:**

• Describe the overall blueprint for our ongoing and envisioned administrative systems and how they are and/or will be inter-connected.
• Based on the blueprint architecture, define a comprehensive roadmap for the integration and interoperability of the UA’s administrative systems.
• Identify the most cost-effective solutions for improving business operations and systems on the roadmap. Provide a disinterested evaluation of improvement versus replacement, and of incremental, modular, and system replacements and/or improvements for major functions including pursuing open source initiatives like Kuali.
• Continually explore opportunities for collaboration on a Tri-University basis on administrative systems.
• Develop standards and templates for common “look-and-feel” and other functionality for presentation and application, maintenance, and development.
• Describe data warehouse architecture, capability, and usability as a support for administrative system operations as well as its current role in reporting and analysis.
• Implement significant human-resources-related improvement projects on payroll, time capture, and, subsequently, other elements of the related roadmap.
• Implement significant student information system related improvement projects for calendaring, course enrollment and management, and process automation, e.g., prerequisites, and then other elements of the related roadmap.
• Replace the Sponsored Projects Information System with Kuali Research Administration.

The UA network must minimally keep pace with and preferably exceed the speed demands of the university and community. In 2003, the UA set in place a 10-year Network Master Plan which serves as a strategic direction for infrastructure improvements for the University. Creating a business model to assure funding of the Network Master Plan remains one of UA’s biggest challenges. The core of the business model must focus on upgrading the university network, the internal building networks and the quality of service components, which include attention to redundancy and stability.

Goal 3: The communications infrastructure must be robust, reliable, standardized, consistent, state-of-the-art, and operating with continuous improvement and stable funding.

Actions:

• Identify funding to conduct basic upgrades to the core network, the internal building networks and the quality of service components, which include redundancy and stability.
• Complete the installation of wireless.
• Stabilize the current budget by transitioning to an FTE-based funding model by July 2008.
• Continue the deployment of Voice-over-IP.
• Continue to install converged communications infrastructure in new buildings.
Securing the University network, computer systems and data is a challenge to all major research universities, given factors such as size, diversity of operations, and openness. Nationally there is a dramatic increase in the level of illegal, destructive activities focused on the end users at universities, with the objectives of stealing identities, compromising machines, and propagating viruses. The complexity of these threats coupled with current and upcoming federal and state legislation require that UA strengthens its security posture specifically with respect to the interface between the university and the external world. The recent security incident at the UA has driven security to the very top of our priority list. Protecting the university network and information assets continues to be a challenge and we strive for more proactive approaches.

**Goal 4:** The University’s information assets and technology environment must be increasingly and effectively secured in a consistent standardized manner without limiting our academic and research freedoms.

**Actions:**

- Formally institute an Information Security Policy.
- Rigorously enforce all information technology policies and standards.
- Define and implement an overall plan focused very specifically on security vulnerabilities.
- Establish and maintain an inventory (database) of all networked devices, applications and data.
- Explore solutions for fast, secure storage (that includes professionally managed backups) to all interested students.
- Insure that faculty and staff have affordable, professionally managed and regularly scheduled backup solutions available for use.
- Continuously review to identify and address security vulnerabilities before problems occur.
- Publish minimum infrastructure standards for all wired and wireless networks and environmental standards for housing servers and data.

The university must improve security for its computing and information assets by increasing awareness within the university community, developing and implementing security guidelines, and taking physical actions to secure the data network against external and internal threats.

**Goal 5:** We must appoint a University Information Security Officer (UISO).

- Conduct a national search and hire an University Information Security Officer (UISO).
- The UISO will report to the Chief Information Officer (CIO).
- Serve as the University’s senior advisor on information security issues.
- Raise the visibility and importance of network protection and improving education on issues of computer security, privacy, professional ethics and information
technology responsibility.
• Work with varied operational units to implement the Information Security Plan.
• The UISO will serve as liaison between non-technical users and technology experts.
• Establish an assessment and audit program in support of the Information Security Policy.
• Develop information security policy, procedures and guidelines with consideration of relevant legislation and legal interpretation.
• Continuously monitor risks related to information security and on recommended actions to minimize risk.
• Work with university auditors and others to evaluate information security risks and to monitor compliance with established policies and procedures.
• Direct a systematic effort at discovery and remediation of vulnerabilities.

We have come to a point at the UA where we must move from the open environment our community has come to expect to a more secure and monitored environment that more effectively secures our university in a consistent standardized manner without limiting our academic and research freedoms. Given the limited centralized network and systems staff dedicated to security, our future direction must include implementing security related processes and procedures throughout the university. These processes and procedures need to promote and enforce responsible computer and data use amongst all users. This will require setting University policy, standards, guidelines and best practices that must be enforced and universally followed. We must continually educate ourselves of our responsibility and hold all members of our university community accountable to help minimize the University’s exposure to the ever growing number of threats.

Goal 6: Members of the university community must become increasingly aware of their responsibilities, and accept accountability for minimizing the university’s exposure to the ongoing threats.

Actions:

• Provide adequate authority to enforce IT policies and standards.
• Create an IT audit/consulting organization that is responsible for the enforcing policies, reviewing security plans, and providing advice and assistance to individual groups.
• Offer periodic university-wide training sessions and workshops for different focus groups, including faculty, staff, and students.
• Augment IT orientations for incoming students
• Develop training and certification programs with relevant security requirements and guidelines.
• Raise awareness of legal and ethical issues concerning sharing of intellectual property and other digital content among students, faculty, and staff.
LEADERSHIP, FUNDING, AND GOVERNANCE

Information technology affects all individuals and units in the university. The Chief Information Officer (CIO) is responsible for high-level strategic goals with other University leadership and aligns IT decisions with institutional objectives. Tactical decisions about information technology must be made in the total context of the university’s strategic business and academic needs.

Goal 7: Recruit a CIO.
(Because this step is imminent and pressing, detailed elaboration follows).

Responsibilities in relation to Institutional Mission

- Directs IT to prime mission functions, i.e., education, research, outreach, financial administrative stewardship
- Shapes the vision of IT with the institutional mission overall, and with the particular strategic advantages of the UA, thus creating better access to critical resources to UA community
- Fosters an environment of collaboration both within the university structure and with regional organizations
- Single spokesperson for IT policies and strategies at UA
- Partnership with CIOs in Arizona University System, to achieve synergies in IT
- Close working relationship with ABOR’s IT-AZUN Subcommittee, System-wide stewardship
- Executes network strategy, security strategy, research strategy, instruction strategy, and systems strategies
- Supplier of IT functions; prepares the service portfolio for whole leadership team; knows all of the support services (existing, desired), and prioritizes them so that there is the right mix
- Makes certain that UA chooses to do the right things in IT, and then oversees these services such that the organization does things right
- In charge of cost effectiveness of IT for the institution
- Gains access to all of the information that management needs to make informed decisions re/ IT, including departmental inventories of everything
- All methods and procedures in regard to making decisions, quality assurance, security, etc
- Engages in contract negotiations, with understandings of standards expected in describing service portfolios, service agreements, etc
- Compliance with all laws and policies
- Preemptive work to minimize risk of security breeches

Desired Attributes

- Has and maintains a broad understanding of the business side of higher education (research, teaching, outreach, administrative support), technology, and leadership
- Compelling leadership capacity including vision, collaborative skills, and decisiveness
- Deep experience in the “technology” of information technology
- Leadership and personal-professional characteristics that draw people together
▪ Breadth of experience and abilities permitting cutting across specialty areas and boundaries
▪ Knows what IT services will enable UA to be more secure, efficient, productive, and successful
▪ Can effectively interpret and describe the business of higher education and the technology that must support that business
▪ Knows project management and how to assure timely delivery of IT systems
▪ Understands how to build an IT infrastructure from a technical point of view
▪ Though CIO does not have to have sweeping knowledge of all technologies, he/she must know how and where to get that knowledge for the good of the institution
▪ Willingness and capacity to take ownership, to have ‘skin’ in the game, to be fully informed of all IT systems, processes, and circumstances at UA
▪ Able in managing change
▪ Understands that IT organizations are marked by ongoing needs to re-organize and transform in ways that keep pace with needs and new technologies, …that an organization is always learning
▪ Understands that the job is fundamentally a strategic job, and that the strategies must be implemented to be real

Reporting Relationship and Authorities

▪ Direct to the President
▪ Close working relationship with Provost and Deans
▪ No barriers in working with all Vice Presidents & Vice Provosts
▪ Member of Cabinet
▪ UA Point Person for ABOR IT Subcommittee
▪ CCIT reports to CIO
▪ IT Security Officer reports to CIO
▪ Heads ITPG
▪ Point Person for all IT at UA

The UA must improve its IT governance structure in ways that support the CIO through collaborative, advisory, and consultative mechanisms, and in ways supported by both central and distributed representation within the university community. There must be better coordination of and more clearly defined roles and responsibilities for IT resources at the UA. This involves establishing an appropriate balance between central and distributed leadership. The university can nurture a collaborative environment by improving and formalizing communications between all information technology areas. Consistent and continual communication is important to a healthy, productive environment and will foster a spirit of trust and cooperation across the institution. The University must seek input from all areas of the institution to ensure buy-in and support of strategic technology decisions and initiatives. Exploring solutions for better cost efficiencies and defining better ways to utilize our resources will require a great deal of cooperation among many units. The same is true for our relationships and partnerships with local national organizations.
Goal 8: Information technology must be more effectively managed within a governance structure that is collaborative, advisory, consultative, and comprised of both central and distributed representation that includes all areas of the university community.

Actions:

- Revisit and build a clearly delineated IT governance structure for direction setting, advisement, feedback, and decision making.
- Define clear roles and responsibilities with respect to instructional computing, research computing, and university IT services.
- Establish consistent guidelines and best practices for all IT activities in the university.
- Articulate the principles that should guide our actions and decisions related to governance, funding and structure.
- Develop a trusting and sharing university environment that fosters mutual respect and understanding.
- Explore other tri-University collaboration opportunities.
- Continuously measure performance and progress at all levels of information technology to maximize effectiveness.

The need for financial prudence heightens our need to identify new support models for better cost efficiencies and resource utilization not only within the central support units but across the University. The UA must create a sustainable, dedicated funding model for IT, and with the expectation that funding decisions and costs will be based on working operational models. An appropriate information technology funding model must establish regular and sustainable funding for mission-critical systems and services and for continuous maintenance and periodic upgrades of technology. An essential step in developing a funding model is to identify a sustainable funding stream to maintain and continuously improve the university’s technology so we are able to benefit from modern technology.

Goal 9: Funding for mission-critical systems and services must be routine, permanent, and adequate, allowing for continual technology refresh, enhancements, and updates. Financially prudent support models must be exercised for better cost efficiencies and resource utilization.

Actions:

- Define and publish a model identifying the minimum levels of annual permanent funding required to support core services including remediation, daily operational and lifecycle costs.
- Develop an understanding of the costs per FTE for information technology.
- Develop a better understanding of IT funding models, identify funding sources, and outline the processes for budgeting, funding IT investments and IT spending, such as an incremental budgeting approach to administrative systems.
- Define a methodology for calculating the Value-on-Investment (VOI) and/or Return-on-Investment (ROI) of strategic IT initiatives.
- Utilize the Student Technology Fee to address the technological priorities identified by the Information Technology Student Advisory Board (ITSAB).
CONCLUSION

The capacity of the University of Arizona to carry out its fundamental mission responsibilities in teaching, research, and outreach; its desire for focused excellence efficiency and effectiveness; and its fiscal responsibilities related to stewardship of resources; requires a 'step-function' advancement in its further development and utilization of information technology. The goals presented in this strategic plan, along with an array of prioritized, relevant action steps, must lead us to significant enhancements in services and infrastructure, security and access, and leadership, funding, and governance. This plan creates an informed basis for President Shelton and his executive team to make decisions regarding pathways of investment into information technology. Furthermore, the plan creates a platform and explicit set of expectations for the recruitment of the University of Arizona’s next CIO.