WE GROW LEADERS,
WE GROW FUTURES,
WE GROW THE NATION

Strategic Plan

UA College of Agriculture & Life Sciences

The University of Arizona
2013-2017
Strategic Planning at the University of Arizona

The University of Arizona redefines the land-grant mission for the 21st century by leading the country in providing affordable access to a world class education and solving the Grand Challenges facing humanity in focus areas of Biological and Biomedical Systems, Environment and Sustainability, Space Sciences and Related Technology, Technology and Society, Global Impact and our Regional Roots.

University of Arizona Vision Statement
The University of Arizona is a leading public university of the 21st century, with regional roots and global impact. UA is a hub for learning, knowledge creation and dissemination, and innovation – a place of boundless possibilities.

University of Arizona Mission (draft)
A Public Research University, the University of Arizona provides a comprehensive, high quality education that engages our students in discovery through interdisciplinary research and broad based scholarship, serving the diverse citizens of Arizona and beyond. We empower our graduates to lead in solving complex societal problems. In teaching, research, outreach or student engagement, access and quality are the defining attributes of the University of Arizona’s mission.

University of Arizona Values
The shared values of the University of Arizona are the bedrock on which it has been built and the foundation on which we will build for the future.

- Excellence
- Integrity
- Innovation
- Interdisciplinarity
- Societal Impact

- Access
- Diversity
- Openness
- Pride of Place
Arizona Board of Regents (ABOR) Strategic Goals

1. **Educational Excellence and Access** -- quality degree production aimed at increasing the educational attainment of Arizonans.

2. **Research Excellence** -- national research prominence for Arizona University System with peer rankings of top American research universities.

3. **Community Engagement and Workforce Development** -- research, economic development, and community engagement used to strengthen the economy and improve quality of life in Arizona.

4. **Productivity** -- resources maximized to produce greater numbers of quality degrees without sacrificing quality.

University of Arizona Academic Focus Areas

A comprehensive AAU Research I Land Grant Institution, the University of Arizona is recognized for its excellence in:

- Biological and biomedical systems, with special emphases in translational and clinical health sciences, bioinformatics, and biotechnologies;
- Environment and sustainability, with special emphases in water, climate, energy, arid lands, policy, and sustainable design;
- Space sciences and related technologies, with special emphases on leveraging our strengths in the physical sciences to expand crosscollege collaborations;
- Technology and society, with special emphases on information and data science ("big data"), information management, transport, and security, as well as digital cultures and access, human interfaces and autonomous/robotic systems;
- Global impact, with special emphases on international, transnational and area studies as well as world literatures, languages, histories and arts;
- Regional roots, with special emphases on Southwestern cultures and borderlands, as well as professional education, workforce development and community engagement.
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Executive Summary

The University of Arizona’s College of Agriculture and Life Sciences (CALS) embraces life, environmental and many social sciences.

CALS was our state land-grant university’s founding college and our historic role has been to create new people and new knowledge for a new economy. This mission is the core of the nation’s land-grant universities’ shared mission and is as relevant today as it was in 1862 when the Morrill “land-grant university” Act was signed.

CALS has a matrix structure with three mission areas of teaching, research and the cooperative extension system and with coinciding academic delivery units of schools and departments. Our strategic plan is focused to allow us to be resilient, regionally responsive to our stakeholders and globally relevant.

We must be more innovative, entrepreneurial, flexible and nimble when addressing both the practical problems of society and the basic science challenges that underpin new knowledge generation. We need to accept risk as part of our management and leadership norms. We will employ a “Deming cycle” of continually reviewing what we are doing so that we can change as soon as we see a better path forward.

The great recession, beginning in 2007, signaled that a new normal would emerge from a period of crisis. We are just now, five years later, beginning to understand what this new normal is. We do face a new reality of uncertain future economic conditions and our resulting funding levels. We have always known that we need to be where the world is going, not where it is today.

We expect that today’s graduates will have multiple careers, not just multiple jobs.

We face, and need to be responsive to, rapidly changing technologies, delivery models, age and demographic diversity, and state demographics.

New energy sources, more efficient water and energy use, the value of food and food production will increase and these are all key areas that we can positively influence and impact, especially in our region.

Our overarching response is to focus on resilience in our management systems and what we do. We will deliver resilience through integrated systems with five interconnected components:

- Arid and Semi-Arid Region Agriculture and Environment
- Individuals, Families, Communities, and Organizations
- Globally Oriented Basic and Applied Research
- Border commerce
- The bioeconomy

The college works on six distinct, yet interconnected and interdependent focus areas:

1. Environment, Energy and Natural Resources
2. Plant, Insect, and Microbe Systems
3. Health and Food Safety
4. Families and Communities
5. Animal Systems
6. Commerce

We must be extremely specific about how we allocate resources in future and this plan includes six specific guiding principles for doing so. Overall we allocate resources to meet needs and directions of the University of Arizona as a whole as well as based on being an exceptional and critical hub in the nation’s knowledge network.
This plan has been developed starting from the points of delivery to my office and has involved all 1,058 people employed during the process. Every unit in the college has developed a plan in the same format so that these can be compared and contrasted. When presented from the administrative center in my office outwards, each plan gets more granular and more specific. In this document, the overarching college plan is presented first followed by those of each of our three mission areas. Each unit’s plan follows. Additional plans that describe specific missions within the units, and very often are shared between units, follow these. The college and the three mission area strategic goals are listed below:

**College of Agriculture & Life Sciences**
1. Be a leading economic development engine for Arizona.
2. Produce employable graduates, who can do jobs that do not yet exist and create new jobs.
3. Be the most sought-after place to be a part of.
4. Be the most effective, efficient, responsive, flexible, and financially sustainable college on campus.

**Teaching: Career and Academic Services**
1. Enhance student learning opportunities.
2. Improve learning and career development infrastructure.
3. Develop financial support for Career and Academic Services.
4. Enhance career development.
5. Expand innovative educational programs.
6. Enhance CALS retention.
7. Promote faculty excellence.
8. Enhance CALS recruitment.

**Research and Experiment Stations**
1. Build on existing research strengths.
2. Identify and invest in CALS research infrastructure needs.
3. Define and measure productivity and resource generation for research.
4. Expand communication on research activities.
5. Build tech transfer, intellectual property development, external business relations/development.

**Cooperative Extension and Economic Development**
1. Excellence in integrated CES research and education programs that improve lives, communities, and the economy (4-H YD, FCHS, ANR, FRTEP).
2. Demonstrate and communicate the positive economic and social impacts of the CES programs.
3. Invest CES resources in a strategic manner to address priorities and critical needs in Arizona and globally.

Shane C. Burgess  
Vice President for Veterinary Sciences and Cooperative Extension  
Dean, College of Agriculture and Life Sciences  
Director, Arizona Experiment Station
College Overview

The special and historic nature of colleges like ours

Colleges like CALS were founded in agriculture but now embrace all life, environmental and many social sciences. They are present in each “land-grant” university. These colleges operate differently from other colleges on the UA campus. It is our heritage and the associated traditions that form the basis of the land-grant university culture.

One hundred and fifty years ago this year, colleges like CALS were the first units established at the new land-grant universities founded by the Morrell Act of 1862. Enacted in the middle of a devastating civil war, this act launched the then revolutionary concept of public education. It was a direct response to the industrial revolution, changing social class structures and the need for a highly educated population so that the United States could become a player in the world economy. For the first time, anyone could attain a tertiary education regardless of family wealth and/or political connections or other privilege. Today this aspect of our college mission is managed and led by Career & Academic Services and our extremely diverse academic degrees are offered by academic units called “schools” or “departments” (see figure on page 4).

Following closely in time, the Hatch Act of 1887, was a direct response to America’s need to be a technologically advanced economy based substantially on a publicly funded and interconnected national network of research resources—these are our Experiment Stations. Today, as in the past, the Arizona Experiment Station (AES) provides campus-based and state resources dedicated to be used in research for technology innovations for US economic security.

Lastly, the Smith-Lever Act of 1914 established the Cooperative Extension System (CES), this was a direct response to the need for a focused direct approach to get the new knowledge created in the land-grant universities directly to the newly educated populace and so into the marketplace. The term "cooperative" means there is a three-way partnership between the University of Arizona (through CALS), the counties, and the US Department of Agriculture. Each county has at least one CES office and some have several; six Indian reservations also have CES offices. As part of the AES, there are also nine agricultural centers throughout Arizona.

While each university is different, and regardless of internal administrative structures, the basic tripartite paradigm of colleges like ours is shared with land-grant universities nationwide. This paradigm has proven a model for resilience and so successful that it has been imported by other countries as a preferred archetype of education, economic development and a component of national security. Land-grant colleges are found at many of the country’s elite universities.

In short, our historic role has been to create new people and new knowledge for a new economy; this is as relevant today as it was in 1862.

Our challenge today is to be thought leaders creating tomorrow’s commercial leaders, tomorrow’s environment and to be direct contributors to the rapidly changing 21st century economy.
Our unique relationship with the federal government

Nationwide, colleges like ours have a unique relationship with the federal government. A portion of our budget comes from the US Department of Agriculture (USDA) after passing through the Arizona State Legislature as part of the college’s appropriated budget. This requires the CALS research and CES efforts to operate through a Plan of Work and to submit an Annual Report of Accomplishments and Results to the USDA, as well as individual reports for each cooperating faculty member’s research effort and Impact Statements on our program results. We are also charged to work directly with our sibling colleges nationwide in a cooperative and information sharing process—particularly with these colleges in the western region. These efforts include sharing of printed and electronic information, as well as joint basic, applied and cooperative research projects. We have an obligation to attend professional meetings where information is shared and to submit research information in the form of publications to federal databases.

CALS Management Structure

CALS has a matrix structure of three mission areas of teaching, research and cooperative extension (each led by an associate dean) coinciding with academic delivery units (each led by unit leaders). Business operations and infrastructure delivery are functionally organized.

### Mission areas, associated federal acts and academic units.

<table>
<thead>
<tr>
<th>Career &amp; Academic Services Morrill 1862</th>
<th>Experiment Station &amp; Research Hatch 1887</th>
<th>Economic Development &amp; Cooperative Extension Smith-Lever 1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural and Biosystems Engineering (ABE)</td>
<td>Agricultural and Resource Economics (AREC)</td>
<td></td>
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<tr>
<td>Agricultural Education (AgEd)</td>
<td>Animal Sciences (AS)</td>
<td></td>
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<tr>
<td>Entomology (ENT)</td>
<td>Norton School of Family and Consumer Sciences (NS-FCS)</td>
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<tr>
<td>Nutritional Sciences (NS)</td>
<td>School of Natural Resources and the Environment (SNRE)</td>
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<tr>
<td>School of Plant Sciences (SPS)</td>
<td>Soil, Water and Environmental Science (SWES)</td>
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<tr>
<td>Veterinary Science and Microbiology (VSM)</td>
<td>SUPPORTING INFRASTRUCTURE</td>
<td></td>
</tr>
<tr>
<td>Administration &amp; Services,</td>
<td>Communications &amp; Technologies,</td>
<td></td>
</tr>
<tr>
<td>Development &amp; Alumni Relations,</td>
<td>International Programs</td>
<td></td>
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</tbody>
</table>
Responsibility and accountability for managing inputs and delivering on objective metrics for the three mission areas is vested in the associate deans. Authority, responsibility and accountability for managing inputs and delivering on objective metrics within the academic delivery areas (and thus the disciplines) is vested in the unit leaders. This means that most metrics used to measure, deliver and resource inputs are specifically identified by the three mission areas (Career & Academic Services; Experiment Station & Research; Economic Development & Cooperative Extension) and academic discipline delivery units. It also means that as the strategic plans get closer to the point of delivery in the units, they become more granular, more detailed and more specific.

Overall the college delivers on all three mission areas of cooperative extension, research and teaching, but, as shown in the graphs below from FY12 showing return on investment relative to the percentage of the CALS budget invested in the unit, different units have different relative contributions. This is one of CALS strengths as it contributes to our own resilience.
**Metrics.** These metrics are defined by the Arizona Board of Regents and will be used for performance-based funding decisions.

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<td>Number of Bachelor's Degree Awarded</td>
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<td>292</td>
<td>275</td>
<td>266</td>
<td>263</td>
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<td>307</td>
<td>314</td>
<td>332</td>
<td>364</td>
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<tr>
<td>Undergraduate Enrollment</td>
<td>249</td>
<td>293</td>
<td>276</td>
<td>267</td>
<td>264</td>
<td>278</td>
<td>281</td>
<td>268</td>
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<td>Number of Master's Degree Awarded</td>
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<td>Number of Doctoral Degree Awarded</td>
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<td>36</td>
<td>38</td>
<td>43</td>
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<td>45</td>
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</tr>
<tr>
<td>Number of Doctoral Degree Awarded in High Demand Fields</td>
<td>90</td>
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<td>90</td>
<td>90</td>
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<td>90</td>
<td></td>
</tr>
<tr>
<td>Research &amp; Development Expenditures (in $1.000's) - Res deps only, SPs only</td>
<td>28,838</td>
<td>27,437</td>
<td>31,375</td>
<td>31,229</td>
<td>29,541</td>
<td>29,139</td>
<td>29,968</td>
<td>29,608</td>
<td>32,244</td>
<td>35,460</td>
<td>38,878</td>
<td>42,683</td>
<td>46,522</td>
<td>50,882</td>
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<tr>
<td>Research &amp; Development Expenditures (in $1.000's) - Res deps only, all accs</td>
<td>69,219</td>
<td>65,222</td>
<td>68,733</td>
<td>68,718</td>
<td>70,232</td>
<td>68,869</td>
<td>66,555</td>
<td>70,382</td>
<td>70,650</td>
<td>84,150</td>
<td>92,420</td>
<td>101,418</td>
<td>110,591</td>
<td>126,954</td>
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<tr>
<td>Research Excellence (measuring share or UI budget) Higher productivity only</td>
<td>25,032</td>
<td>20,721</td>
<td>30,767</td>
<td>30,320</td>
<td>34,434</td>
<td>35,112</td>
<td>35,815</td>
<td>36,531</td>
<td>37,202</td>
<td>38,042</td>
<td>39,707</td>
<td>39,542</td>
<td>31,626</td>
<td>34,417</td>
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<td>Research &amp; Development Expenditures (in $1.000's) - Res deps only, all accs</td>
<td>20,541</td>
<td>20,053</td>
<td>20,713</td>
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</tbody>
</table>
CALS PURPOSE, VISION, MISSION AND CORE VALUES

Purpose: To ensure resilience and health of our communities, people, environments, and economies locally, regionally, and globally.
Vision: To be the most important driver in Arizona’s economy, and the world’s top college, in 21st-century agriculture, life sciences, and commerce.
Mission: To educate students and communities in ways that enable their future success in the regional and global economies and to develop new knowledge and new technologies to benefit society.

Core Values

Trustworthiness — we are honest and non-biased in our communications and committed to what we promise.
Practicality — we focus on education, research and outreach with near-term value and application as well as long-term solutions.
Responsiveness — we identify and respond to changing needs.
Relevance — we promote ideas and productivity that create positive impacts.
Entrepreneurship — we pursue initiatives that include calculated risk to deliver value.
Ingenuity — we reward innovation.
Compassion — we care about each individual’s and community’s circumstances, experiences and contributions.
Respect — we expect professionalism and collegiality.
Pluralism — we have formal delegated responsibility and authority and believe in faculty governance and collaboration.
Egalitarianism — we are committed to an accessible education and broad-based research rather than academic elitism.
Diversity — we embrace individual differences in thoughts, ideas, and actions, as well as personal experiences, histories, and perspectives.
Environmental Scan

THE UNIVERSITY OF ARIZONA COLLEGE OF AGRICULTURE & LIFE SCIENCES FOR THE 21ST CENTURY

Like our nationwide peers we are located in our state's land-grant university. The College of Agriculture & Life Sciences (CALS) at the University of Arizona was the founding entity for the university and we continue to represent the founding mission and vision of the university.

CALS is mandated to deliver on all three of the land-grant mission areas of teaching, research and cooperative extension. Our strategic plan presented here focuses on what the college will be and what it needs to deliver in 2021. This process, branded as “CALS21” (http://cals.arizona.edu/dean/cals21/newstrategicplans/index.html), builds on the background provided by the CALS 2010 Strategic Plan (http://cals.arizona.edu/dean/planning/CALS%20one%20page%202010%20strategic%20plan%202-10.pdf). Much of what immediately follows in this overview has been drawn, or quoted directly, from that plan.

We recognize that the world we live in today is volatile, uncertain, complex, and ambiguous and we also recognize that we can survive it by being flexible, agile, innovative, and responsive. Doing only what we have been doing is not going to be effective.

Life will be more complicated not only for our faculty and staff, but for our students and our many constituents in the state and elsewhere. We cannot simply extrapolate trends – the future is highly uncertain and we need to understand and learn to function in such times. This means we will have to do things differently, but so will others with whom we work.

The rest this decade, from now until 2021, will be a period of continuing change and seems to have ushered in a new generation; we need to be prepared for both. There will be more significant changes and more uncertainties and perturbations and we will focus on plans that allow us to be most resilient and responsive to our stakeholders and globally relevant in these areas.

Our choices will be more difficult to make and to implement than any time in the memories of those working today. We can only plan for actions that are under our college’s control but we have to be aware of options open to the state and university.

We will need to be more innovative, more entrepreneurial, more flexible and more nimble in addressing both the practical problems of society and the basic sciences. Being more entrepreneurial in particular means we need to accept risk as part of our management and leadership norms. We must continually review and be able to change direction quickly when we realize our risks are not paying off. We retain our three primary mission areas of teaching, research, and cooperative extension.

It is not possible to predict or even make a good guess at how our world will emerge from the great recession. We cannot simply extrapolate past experience; the Great Depression was ended by massive government spending induced by a world war. In 2010 CALS used a “Foresight to Insight to Action” approach developed by the Institute for the Future (http://www.iftf.org/home/) to describe how we should think about the future.

- The FORESIGHT studies suggested we are entering a world that is Volatile, Uncertain, Complex and Ambiguous.
The resulting INSIGHTS suggested a need for clear strategic directions as well as focused goals, but also to be Flexible, Agile, Innovative, and Responsive.

Our ACTIONS, therefore, need to be different than those of the past and our strategic directions need to be within the context of a series of transitions within a changing world. No one who is working today has solved the kinds of problems we are dealing with today.

The great recession, beginning in 2007, signaled that a new normal would emerge from a period of crisis. We are just now, five years later, beginning to understand what this new normal is. But we do know very well that our audiences for this new normal include, as they always have, our students and Arizona’s people, communities, industries, businesses, and organizations. In addition, we have national and international obligations for knowledge sharing and research involvement and to prepare future leaders and experts in their fields.

**Resilience through integrated systems**

In 2010 one theme emerged after reviewing the challenges facing the world and the southwestern United States and then matching those challenges to our college breadth, expertise, experience, and history of interdisciplinary approaches—for both basic research and practical problem solving. That theme is resilience through integrated systems and it has five interconnected components:

- Arid and Semi-Arid Region Agriculture and Environment
- Individuals, Families, Communities, and Organizations
- Globally Oriented Basic and Applied Research
- Border commerce
- The bioeconomy

Resilience has multiple “sustainability” paradigms: defined broadly, and not just environmentally (i.e. climate, energy, water, plants, and animals); it also includes social and economic components such as commerce, global trade, food production, development, jobs, institutions, health, security, transportation, families, communities, communication, consumer perspectives, political interactions and infrastructure. Overall, CALS takes a systems perspective, where a variety of things are interconnected and interdependent and this is widely applicable to many college programs.

Today CALS is focused on resilience: our capacity to deal with events, whether predictable or not.
Colleges of Agriculture & Life Sciences in the early 21st century

We need to be where the world is going, not where it is today.

Major periods of change have occurred in the past and over time our societies and commerce adapted (either rapidly or slowly, depending on the type of change) or died out. Today many significant things are happening concurrently – technology, demographics, economics, resources, physical and virtual infrastructures, life forms, genetics, memetics and general infrastructure are changing; the scale is larger; the speed is faster and more globally interconnected; the degree and complexity of change requires greater effort on the part of many institutions (e.g., business, government, and education).

Colleges like ours have changed dramatically over the years and a number added “Life Sciences” to their names, as we did in 2000. This isn’t just a marketing ploy. It is instead recognizing that colleges like ours impact an enormous proportion of our commerce and we are central to the nation’s changing economy.

CALS produces new people and new knowledge that support our growing economy through a very broad variety of industries – from ranching and greenhouse agriculture to biotechnology, retail management, and social services. The following table demonstrates the dramatic and far-reaching economic impact that our academic, research, and outreach programs have on Arizona’s economy and the nation’s.
### Sector Value to Arizona Value to U.S. Arizona Jobs

<table>
<thead>
<tr>
<th>Sector</th>
<th>Value to Arizona</th>
<th>Value to U.S.</th>
<th>Arizona Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL SECTORS DESCRIBED BELOW</td>
<td>$129.7B</td>
<td>$6.4T</td>
<td>1,900,837</td>
</tr>
<tr>
<td></td>
<td>50% of Gross State Product</td>
<td>42% of Gross National Product</td>
<td></td>
</tr>
</tbody>
</table>

#### Animal Agriculture

- Cattle ranching and farming: $638M
- Dairy cattle and milk production: $657M
- 4-H livestock projects and fairs: $4.8M
- Hog farming: $53M
- Horse industry: $1.1B
- Sheep farming: $6M

**Total for animal agriculture industry**: $2.5B

#### Aquaculture

- Aquaculture private production: $3.1M
- Aquaculture public hatcheries: $849.7M
- Aquaculture research and development: $120M

**Total for aquaculture industry**: $852.8M

#### Intensive Agriculture

- Nursery production and landscaping industry: $1.6B
- Greenhouse vegetable production: $203M
- Sod production: $10M
- Turf management: $611M

**Total for intensive agriculture industry**: $2.4B

#### Extensive Agriculture

- Apples: $3M
- Barley: $22M
- Broccoli: $43M
- Cabbages: $23M
- Cantaloupes: $97M
- Cauliflower: $33M
- Chiles: $10M
- Citrus fruit: $45M
- Corn: $16M
- Cotton: $700M
- Date palms: $35M
- Dry beans: $12M
- Hay: $168M
- Honeydew melons: $13M
- Leafy greens: $600M
- Lettuce: $608M
- Pecans: $61M
- Potatoes: $17M
- Sorghum: $8M
- Watermelons: $29M
- Wheat: $51M

**Total for extensive agriculture industry**: $2.6B
### Strategic Plan

#### College of Agriculture & Life Sciences

<table>
<thead>
<tr>
<th>Industry/Field</th>
<th>Revenue 1</th>
<th>Revenue 2</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioethanol production</td>
<td>$130M</td>
<td>$36.5B</td>
<td>100</td>
</tr>
<tr>
<td>Biosciences</td>
<td>$1.2B</td>
<td>$28.8B</td>
<td>96,223</td>
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<tr>
<td>Biotechnology/biomedicine</td>
<td>$12B</td>
<td>$664B</td>
<td>168,000</td>
</tr>
</tbody>
</table>

- **Basic science & clinical research, sales & distribution, pharmaceutical & nutraceutical development**
- **Dietetics** $93M
- **Life, physical sciences** $663M

- **Agricultural scientists, microbiologists, physicists, chemists, environmental scientists/consultants, geoscientists, hydrologists, atmospheric scientists** $58.3B

<table>
<thead>
<tr>
<th>Industry/Field</th>
<th>Revenue 1</th>
<th>Revenue 2</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable energy</td>
<td>$2.1B</td>
<td>$16,790</td>
<td>3,390</td>
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<tr>
<td>Veterinary industry</td>
<td>$170M</td>
<td>$7.5B</td>
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</table>

**Total for biotechnology & medicine industries** $16.3B

<table>
<thead>
<tr>
<th>Industry/Field</th>
<th>Revenue 1</th>
<th>Revenue 2</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food, fitness &amp; wellness industries</td>
<td>$12B</td>
<td>$725B</td>
<td>168,000</td>
</tr>
</tbody>
</table>

- **Restaurants & hospitality, foods industry, diet** $725B
- **Retail-related occupations** $20.1B

**Advertising, sales, public relations & fundraising, insurance, human resources, training & labor relations, convention & event planners, budget, credit & financial** $1.2T

**Total for business sector** $32.1B

<table>
<thead>
<tr>
<th>Industry/Field</th>
<th>Revenue 1</th>
<th>Revenue 2</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Birding</td>
<td>$1.5B</td>
<td>$36B</td>
<td>15,000</td>
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<tr>
<td>Fishing/hunting/wildlife watching</td>
<td>$2B</td>
<td>$76.7B</td>
<td>17,190</td>
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<tr>
<td>Golf</td>
<td>$3.4B</td>
<td>$195B</td>
<td>20,000</td>
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<tr>
<td>Spring baseball training</td>
<td>$311M</td>
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</table>

**Total for recreation industry** $7.2B

<table>
<thead>
<tr>
<th>Industry/Field</th>
<th>Revenue 1</th>
<th>Revenue 2</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Education</td>
<td>$6.8B</td>
<td>$4,288B</td>
<td>149,000</td>
</tr>
</tbody>
</table>

- **Family studies & human development** $4,288B
- **Psychologists, community & social service, law enforcement, education, training & library, counselors, emergency management, family & general practitioners, home health aides, human resources, training & labor relations, speech-language pathologists** $2.4T
- **Public housing** $34,150

**Total for social services & education sector** $47.3B

<table>
<thead>
<tr>
<th>Industry/Field</th>
<th>Revenue 1</th>
<th>Revenue 2</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>$3.8B</td>
<td>$178B</td>
<td>49,000</td>
</tr>
<tr>
<td>Manufacturing/research &amp; development of microprocessors</td>
<td>$2.6B</td>
<td>$10,300</td>
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<tr>
<td>Mining</td>
<td>$12.1B</td>
<td>$189B</td>
<td>73,100</td>
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</tbody>
</table>

**Total for mining, engineering & manufacturing sector** $18.5B

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New Knowledge, New People, New Economy

Everything that CALS does can be summarized as either generating new knowledge or new people or participating in a new economy. The 1950’s to early 2000’s saw CALS-like colleges move from a production orientation to a science orientation. Today we need to integrate both technology and “basic sciences” into truly translational and impactful science that includes teaching, research and cooperative extension – much faster. The US simply cannot afford to move as slowly as we have in the past. Furthermore, we expect that today’s graduates will have multiple careers, not just multiple jobs.

Some examples of the changes that colleges like ours need to undergo include:

• Becoming more efficient, effective, innovative and entrepreneurial.
• Redesigning curricula and degree requirements especially removing parts of the curricula that are obsolete and/redundant.
• Getting more students valuable degrees faster.
• Offering many learning options and paths.
• Offering executive, professional and continuing education.
• Decreasing the number of employees and programs relative to the numbers of students but improving quality i.e. delivering on rising expectations with decreasing resources.
• Having a different mix of employees and a different mix of job titles.
• Being career focused and not degree focused.
• Being part of the cyber world and new areas of commerce.
• Focusing on being even more of an economic asset to the state.
• Increasing collaboration with other units on campus, other universities worldwide and even non-academic entities.
• Ensuring that we are attractive to all parts of the demographic spectrum.
• Refocusing our cooperative extension efforts to be more in tune with 21st century state commerce needs.
• Making aspects of computer and computational sciences central to agricultural and other life sciences training.
• Becoming “wellness” colleges (as opposed to “sickness” colleges, like medicine).

Key Driving Forces

There are key driving forces that identify where major changes are anticipated to occur in the next 10 to 20 years. The period less than 10 years is heavily influenced by current trends and the period over 20 years contains too many possible options to make for easy consideration. Our driving forces and the key implications for CALS are listed below:

Economic and Financial: The economy is now global, US debt is increasing and financial and other institutions are undergoing change. The 2007 recession-related activities will have a longer recovery period
than historic recessions and the aftermath could last for most of the decade. The changes made as a result will impact our programs as well as our clients and ripple through all our focus areas. In the US the middle class is decreasing as a percentage of the population but on a worldwide basis it is increasing. Measurements of progress more representative than simplistic indicators such as GDP are being developed, and the impacts of aging and entitlement programs will increase. For us this means we face a new reality of uncertain future economic conditions and our resulting funding levels.

Physical and Social Infrastructure: The central Arizona region has been identified as the Sun Corridor “Megapolitan” Area, one of 20 such megapolitan designations in the US. The infrastructure is both aging and changing and includes buildings, cyber systems, transportation of goods and people, the production and transportation of energy and water, life-support systems, communications systems, and the governance mechanisms and roles of government that allow society to function. The rural-urban interface is a critical component to the state’s success. For us this means we face the need to be responsive to technologies and changing state demographics.

Population, Demographics, Generations: The first baby boomers turned 65 in 2011, several states are heading toward no “majority” cultural populations, and costs for medical care and retirements are unsustainable under current assumptions. Furthermore, those born after about 1980 are “digital natives” (i.e. who grew up with modern information technology) and as students learn and function differently than many faculty. Many others outside this age group also wish to take advantage of, and be enabled by, digital technologies. Consumers want different ways to purchase and to control their financial destiny. Furthermore, our 2012 survey of incoming freshmen shows that 70% of these students rank “career prospects” as either very important or important when it came to choosing CALS. For us this means fundamental shifts in delivery models as well as disciplines and that diversity in age and demographics will impact our programs and our funding.

Resources and Environment: Needs for new energy sources as well as more efficient water and energy use will increase. Food, both internationally and in the US, will become a more valued commodity and more food production is predicted to be more vulnerable to climate changes, urbanization, and alternative land uses. The rate of food production gains seen in the past are predicted to slow in the near future. For us this is a key area that we can positively influence and impact, especially in our region.

Science and Technology: Bioscience is continuing to make changes and the implications of those changes on society and agriculture are continuing to unfold. Information technology is introducing “smart” everything (including sensor uses and robotics) and changes the way people work, learn, and interact socially. The web has moved from Web 1.0 (library, content) to Web 2.0 (collaboration, social networking) and is becoming “smarter” as it continues to evolve rapidly. These areas are also those where we as a college fundamentally connect with medicine. CALS has an opportunity to be part of society’s shift from an illness paradigm to a wellness one. For us this is a growth area.
Focus areas

CALS has multiple academic focus areas that can respond to the challenges we face. These focus areas are independent of specific administrative units and are carried out at units on main campus as well as in county extension offices and agricultural centers across the state. Each administrative unit participates disproportionately in multiple focus areas. The relative effort in each area will vary over time depending on available opportunities and society’s needs. Focus areas are in the Biological Sciences, Natural Sciences, and Social Sciences.

Environment, Energy and Natural Resources

Concerns the issues related to protection, enhancement and sustainable use of our basic environmental resources. These are soil, air, and water and the conservation, management and use of natural resources (wildlife, fisheries, rangelands, forests, watersheds, and flora and fauna ecosystems). Sustainable use of resources and the environment requires attention to public policy and an understanding of human factors as well as resource assessment, monitoring and management.

Plant, Insect, and Microbe Systems

Addresses the production and biology of plants used for food, fiber, livestock feed, industrial products, and for environmental and aesthetic purposes. Optimal and sustained productivity is based on understanding plants from the molecular to ecosystem levels and implementing best management practices, including integrated pest management for insects, weeds, and pathogens.

Health and Food Safety

Focuses on the relationships of the life sciences to human health promotion, disease prevention and food safety. Programs use interdisciplinary approaches to discovering, translating, and applying how nutrition and physical activity can prevent disease and promote good health and well-being. The safety and quality of food for human consumption includes transportation, processing and consumer handling. Overall, approaches range from basic cellular and molecular research to clinical human research studies and educational programs.

Families and Communities

Focuses on economic, social, psychological and biological factors affecting individuals, families, and groups over their lifespan. Topics include effective parenting, violence prevention, resource management, responsible decision-making, economic well-being of families and consumers in the marketplace, leadership skill building, and reduced exposure of children to toxins via integrated pest management in schools.

Animal Systems

Encompasses contemporary methods of biology to improve productivity and increase the quality, composition, safety, and desirability of animal products; promotes the use of integrated and long term sustainable production systems that are compatible with arid environments; enhances genetic diversity and biological performance; and improves the health and well-being of food and companion animals.

Commerce

Including consumers, marketplace, trade, and economics, this area deals with supply-chain management and retailing processes from the perspective of both the consumer and the business organization, global and national trade activities, and economic analyses of food and fiber as well as natural resources (including water, land, and the environment). It also contains the economic analysis and resource
allocation processes of businesses, governments, and consumers and strategic analysis of the environments in which market participants operate.

**Resource Allocation**

We must be extremely specific about how we allocate resources. This will be based on being exceptional, and thus impactful, at generating new knowledge, new people and contributing to the new economy. We will focus on where we are genuinely unique, valuable and outstanding and thus a critical hub for the nation’s network of universities. We will also allocate resources consistent with the needs and directions of the University of Arizona as a whole. The following guiding principles will help in decision making when allocating resources:

1. Relevance to this strategic plan.
2. Overall potential and/or actual tangible positive significance and impacts to Arizona and the world.
3. Relevance to state needs, a unique geographical emphasis, or a unique program.
4. Potential for increasing efficiency, effectiveness and innovation.
5. Existing strengths, weaknesses, capacity, and critical mass of unit or program and college.
6. Ability to leverage state investment to develop new funding from outside of the state-funding system.
CALS Strategic Planning: At the coal face.

From December 2011 to May 2012 all CALS employees (1,508 people), in all CALS units statewide worked on a strategic planning process to build detail and specific actions into the 2010 strategic plan. This process, named “CALS 21” (What should a 21st century college like ours look like and what must we be and be delivering in 2021?) was done in three phases, and all units used the same format. Each unit head managed the process within the context of the discipline cultures. The first two phases were concerned with traditional environmental scanning, gap and SWOT analyses and asked tough questions. Together these provided specific and granular descriptions of the internal environment as it affects the units (and thus the college’s) opportunities and challenges. The questionnaires are included below and the answers to each are maintained in the units. Following this, each unit needed to complete the third phase which was to provide a very specific strategic plan in a standard format.
Phase 1: Questions


1. How are we unique in the college, on campus, in the state, in the world?
2. What should we be known for?
3. What are we known for?
4. How are we positioned compared with others "like us" that gives us a competitive advantage and allows us to capture value?
5. How are we doing right now?
6. What are we doing that is:
   a. Essential and positive:
   b. Essential and neither positive or negative:
   c. Essential but negative:
   d. Not essential but positive:
   e. Not essential and neither positive or negative:
   f. Not essential and negative.
7. What deliverables must be maintained?
8. What deliverables must be enhanced?
9. What do we do that should be discontinued or modified?
10. What resources exist in our team, Unit, CALs, UA, the world at large that can help us?
11. What are we passionate about?
12. What are our positions versus our competitors that give us a (unfair) competitive advantage and delivers value?
Phase II: Unit Strategic Planning Initial Report

*Due to CALS Dean April 13, 2012.*

1. Where is the Unit today? (Identify and use objective benchmarks.)

2. Where do we want to be in the future so that we can differentiate ourselves from our competitors to give us a competitive advantage? (Includes specific values for the objective benchmarks selected in 1 and may include addition benchmarks)

3. What should we be focused on today to make it most likely that we will get where we want to go (rank order from most important to least; annotate as short term [1-2 years]; medium term [2-5 years]; long term [5-10 years])? Please use the following headings a-c and provide a justification for why each thing is placed where it is.
   a. Existing areas to preserve, protect, or enhance.
   b. Areas where totally new activities or structures are needed.
   c. Areas to discontinue, de-emphasize, or modify.

4. Other ideas:

5. How do 3a-c align with/complement others CALS and UA units as well as other AZ higher education institutions?

6. Record of dissenting opinions:

7. Additional details (may not be strategic but are good ideas):

8. Appendices (only if needed).
Phase III: CALS Unit Strategic Planning

Please carefully consider the implications for adopting each strategic goal and strategies and the following questions may be useful. Please note that answers to the following questions are NOT TO BE SUBMITTED AS PART OF THE DOCUMENT.

1. How do the goals and strategies proposed lead to unique niches for UA CALS?
2. What does this say about the need for faculty and academic professionals as well as staff and how would they be recruited?
3. How will this affect our ability to recruit and train highly qualified students?
4. How will this relate to our ability to generate funds?
5. How will this affect opportunities for alliances, collaborations and interdisciplinary programs?
6. What internal and/or external factors might positively or negatively affect our ability to attain these goals?

UNIT 2021 STRATEGIC PLAN

Unit’s Purpose:

Unit’s 2021 Vision:

Unit’s Mission:

Unit’s Shared Values:

(1) Schools: please complete for each unit within the school as well as the school as a whole.

(2) Definitive statement about the difference you are trying to make in the world. You may have one purpose statement that encompasses all areas your overall, as well as teaching, research and service purposes or up to 4 purpose statements to describe each separately. Likewise, units within schools may have one or up to four purpose statements.

Examples:
Disney: To use our imaginations to bring happiness to millions.
Johnson & Johnson: To alleviate pain and suffering.
Merck: To gain victory against disease and help mankind.
Southwest airlines: To give people the freedom to fly.
Wal-Mart: To save people money so that they can live better.

(3) What will the outcome be once your unit’s vision has been fulfilled?

(4) What must be done to fulfill your unit’s purpose?
STRATEGIC GOAL ONE: ____________________________________________________________

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

A. **Current situation** (i.e. problem to overcome/opportunity to capitalize on) and **gap between current situation and desired situation**:

B. **Strategy/ies to achieve goal** (list if more than 1):

C. **Actions**

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
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</thead>
</table>

D. **Inputs needed to achieve the goal** (do not limit to financial inputs):

E. **Objective Metrics that will be used to track progress towards attaining goal**:

Notes:
College Strategic Goals and Strategic Plans

The following strategic plan is for the college as a whole and then, more specifically, by our three mission areas. Unit-level plans, in the same format, follow. Each unit’s plan is held by the unit and the college—all are available on the CALS website.

CALS STRATEGIC GOAL ONE:
BE A LEADING ECONOMIC DEVELOPMENT ENGINE FOR ARIZONA.

Current situation and gap between current situation and desired situation:
We believe that we are an economic development engine for the state but do not measure and articulate our economic development impact well.

Strategies (Roman numeral) and actions (bullet point).

i. Focus on regionally responsive and globally relevant education, research, development, technology transfer, and extension.
   • Focus on developing research and extension projects for resilient societies in arid and semi-arid regions.
   • Focus on diversified and non-commoditized industry as well as large scale commodities.
   • Become a partner with local governments and an element in their economic development vision and plans.
   • Help Yuma develop as an energy center.
   • Develop short professional development, executive education, and continuing e-education courses.
   • Develop strategic alliances with industries.
   • Market to Arizona public and State Legislature embrace the concept of CALS research and education as economic growth assets.
   • Focus CALS resources on degrees that allow students the best economic mobility.
   • Have united message and single college-wide identity.

ii. Double research productivity by 2020.
   • Streamline grant/administration routing processes – fewer steps and signatures.
   • Computerize forms for all grant submissions.
   • Sponsored projects support staff to move into the office of the associate dean for research.
   • Salaries of sponsored projects support staff to be connected to IDC
   • Sponsored projects support staff paradigm to go from policing to serving customers to creating advocates
   • Measure true economic impacts annually in terms of jobs, dollars and social impact.
   • Establish a Research Advisory Council to identify specific mechanisms to double research.
   • Improve intra- and extra-CALS collaborations.
   • Exceptional communication especially with other colleges, vice presidents and the community.
   • Become a central partner in all intramural life science, medical and human biology initiatives.
iii. Make the application of informatics (especially “big data” approaches) ubiquitous in CALS.
   • Maintain effective and efficient cyber-infrastructures that are directly used to enhance T, R, E missions.
   • Establish engaged Cyberinfrastructure Advisory Group.
   • De-invest money and people time in commodity IT, which should be delivered by UITS.
   • Educate faculty in using new resources and methods.
CALS STRATEGIC GOAL TWO:
PRODUCE EMPLOYABLE GRADUATES, WHO CAN DO JOBS THAT DO NOT YET EXIST AND CREATE NEW JOBS.

Current situation and gap between current situation and desired situation:
The current perception with our external stakeholders is that we are focused on degrees and not careers and that these degrees could be more relevant to the 21st century.

Strategies (Roman numeral) and actions (bullet point).

i. Value, and develop methods of recognizing, exceptional education.
   • Establish transparent equitable mechanisms for unit heads to make teaching assignments.
   • Reward teaching and provide a professional development path in teaching.
   • Make 4-years to achieve an undergraduate degree the expected norm.
   • Track employability and return on investment for all CALS degrees.
   • Decrease student costs by delivering online coursework within degree.
   • Fund units for teaching FTE on student enrollment and graduation rates.
   • Use “e” or “distance delivery” as a canonical tool and not an end in itself.

ii. Have competency-based certification in skills that employers say they want in addition to technical skills that we teach.
   • Identify what the skills employers say are missing.
   • Identify ways to fit teaching skills into curriculum, especially using e-learning.
   • Develop examination mechanism and certification.

iii. Focus on launching careers in applied professional areas.
   • Change "Academic programs" to "Career and Academic Programs"
   • Establish a general course/s that introduce all CALS students to economics, business principles, the bio-economy, and global commerce--competency based.
   • Define specific opportunities for CALS Ambassadors and define their role in CALS.
   • Establish a “visiting leader” lecture series.
   • Track graduates’ careers as a measure of educational value.
   • Give every CALS student some education in the critical foundations of commerce, especially those taught in CALS already (such as principles of economics, sales and marketing using CALS resources).
   • Partner with other UA colleges to cross-train students in entrepreneurship, computing and business.

iv. Become a national leader in graduate job placement.
   • Restructure Career and Academic Services to have people focused on “Careers, Commerce and Industry” as well as “Distance & Global Initiatives.”
   • CALS to become career- and not degree-centric.
   • Increase supported internships.
• Engage annually with employers to identify what should be in a curriculum that is relevant to the 21st century.

v. **Grow professional education.**
   • Work closely with the UA Outreach and Arizona's community colleges to deliver distance education and degrees at a distance.

vi. **Establish professional veterinary medical education at the UA.**
   • Establish work group to develop novel plan.
   • Identify financial model and financing for plan development.
   • Work with AVMA to develop novel model that addresses the real problems in veterinary education (cost and time to graduation).
   • Get central administration support and funding.
   • Get ABOR support.
   • Build support base within Arizona.
   • Get State Executive and Legislative support and funding.
   • Get AVMA letter of reasonable assurance.
CALS STRATEGIC GOAL THREE:
BE THE MOST SOUGHT-AFTER PLACE TO BE A PART OF.

Current situation and gap between current situation and desired situation:
The most sought after organizations to work in are also the most successful. This is especially important today with shrinking budgets and rising expectations. We have no data on how happy and engaged our people are now; but regardless, as a college we will benefit if we actively focusing on this. The result will be better retention and better recruitment: 1. lower turnover lowers resistance to change and promotes innovation and 2. People hire people for phenotype and fit and we want our great people hiring people they believe have both. We must create an environment where all our people are our “top people” and where they truly enjoy working in CALS, even though they may get paid more elsewhere.

Strategies (Roman numeral) and actions (bullet point).

i. Attract and retain highest performers in all three mission areas
   • Identify clear standards throughout CALS and have a culture that aspires to these.
   • Ensure that CALS accounts for funded work whether it comes through sponsored programs administration or the UA Foundation.
   • Regardless of funder, respect and recognize extra-mural funded work equally.
   • Be results focused and measure outcomes and outputs rather than processes.
   • Identify and remove all non-productive bureaucratic or "busy" work from employees.
   • Measure quality as well as quantity.
   • Establish a culture of respect for all three mission areas and all job titles.
   • Zero tolerance for illegal, unethical or harassing behaviors.
   • Index promotion raises to Consumer Price index (CPI).
   • Index all salaries to CPI.
   • Have the highest compensation:cost of living ratio in peer and aspirants groups.
   • Enable all employees to interact with senior leadership very close to their hire date.
   • High per capita investment in high performers: fewer, but more highly paid and resourced employees.
   • Reinvest what resources we have in the people that we have.
   • Have systems in place to account for all benefits in start-up packages.
   • Make place, purpose, heritage and history part of our DNA.
   • Promote life balance.
   • Provide clear career paths in all three mission areas.
   • Work closely with resource areas to provide new investment in individuals.
   • Rebuild temporary commitment funds to enable the best hires and also provide continual support for existing faculty.
   • Professionalize CALS service units and systems
   • Provide cyber-infrastructure environment that is the best in the peer group and free, including local cloud and highest connectivity.
   • Automate grant forms such as COI, C&P, Data Management plan.
   • Have a culture of "service with partnership" and, from staff in service units, an aspiration to create advocates.
• Have culture of service leadership, enablement and the "inverted triangle" with CALS administers.
• Be a national leader in Cooperative Extension system autonomy and accountability, yet most interconnected to CALS.

ii. Move from the current "1-5 annual" review system that has led to inconsistency across CALS units, grade inflation strings of decimals to system that recognizes accomplishment and is less arbitrary and dependent on individual line managers.
• Develop a review rubric which is based on recognizing: transformations; break-throughs; recognized contributions; when progress is occurring and yet specific improvements are required; when significant specific improvement is required; and when individuals are not achieving expectations or being obstructive.

iii. Use the matrix organizational structure in CALS so that unit heads are the recognized academic leaders and Assoc. Deans are the mission directors and both groups must work together.
• Establish separate meetings between Dean and Unit Heads that are not transactional.
• Dean will involve unit heads in strategic investment decisions.
• Executive Council is advisor to dean who must take the delegated authority and responsible for the college and be accountable.
• Dean must delegate authority, accountability and responsibility to unit heads and mission leaders (ADs) and not micromanage.
• Improve communication in management by establishing cabinet.
• Provide leadership and professional development opportunities.
• AD and unit head annual reviews to prioritize management and leadership knowledge, skills and talents.

iv. Focus on internal and external engagement based on integrity and trust.
• Develop and implement employee engagement tool.
• Set up town halls/agenda-less meetings with college.
• Establish Faculty Consultative Group, Dean’s Research Advisory Committee, Cyberinfrastructure Advisory Group.
• Focus on trust, integrity, credibility, transparency and a sense of overall fairness especially in business affairs.
• Embrace our legal requirement for shared governance and also respect non-shared governance areas of authority, accountability and responsibility delegated from the ABOR.
• Engage with Human Resources as much as possible to take maximum advantage of all that they offer.
• Improve marketing and communication.
• Raise the profile and respect of the office of Development and Alumni Affairs by including the Head DO in cabinet.
• Prioritize communication and transparency in business operations by publically showing college budgets quarterly.
• Dean spends 25% of time on development and external engagement activities.
• Externally focused Dean and internally focused mission directors.
CALS STRATEGIC GOAL FOUR:
BE THE MOST EFFECTIVE, EFFICIENT, RESPONSIVE, FLEXIBLE, AND FINANCIALLY SUSTAINABLE COLLEGE ON CAMPUS.

Current situation and gap between current situation and desired situation:
Currently the college is working on a business model that worked in the 1990s and early 2000s but is not optimal today. We need to reassess how we work with people (internally and externally), our cost structures, and how we use technology.

Strategies (Roman numeral) and actions (bullet point).

i. Maintain sound, efficient, effective and financially responsible college management.
   - Use Activity-based Accounting principles throughout college and operate CALS, and all units, within budget authority.
   - Maintain the minimum administration and bureaucracy.
   - Have similar administrative support structures in each unit.
   - Ensure that all peripheral unit business offices deliver the same level of service at the best level of competence in the university.
   - Standardize unit annual review format to be primarily objective.
   - Minimize bureaucracy, busy work and maintain appropriate infrastructure.
   - All service staff will focus on success and accountability rather than regulation and policing.
   - Maintain appropriate business function infrastructure to efficiently complete work in compliant way.
   - Minimize investment in depreciating assets and maximize investment in people.
   - Measure what we need to manage and only that.
   - Every unit will have a “living” strategic plan in the same format that has clear goals, strategies, actions, responsibilities, inputs and metrics.
   - Maintain 5-year predictive budget model for CALS.
   - Maintain 3-year predictive budget model for academic units.
   - Begin capital projects only once funding is in place.
   - All units with debt to CALS will have a debt management plan and pay debts back.

ii. Decisions and accountability are to be as close to the point of delivery as possible.
    - Administrative heads will be selected and assessed on their leadership and management performance and motivation.
    - Focus scarce Development resources into units that have philanthropic potential and make development a standard part of unit leaders’ jobs.
    - Make delivering on the college’s share of the UA Never Settle plan and ABOR metrics the college’s responsibility, not the units; this allows the units to focus on differential delivery based on their nationally recognized strengths and aspirations.

iii. Deliver only in strategically critical and/or exceptional areas that are regionally important and globally relevant and where we either are national leaders or could be.
• Build strategic partnerships and alliances with other public entities as well as private industry rather than transactional relationships.
• Dean will solicit advice from unit heads, ADs and shared governance leadership before annual budgeting.
ABOR Strategic Goal Areas

1. **Educational Excellence and Access**: quality degree production aimed at increasing the educational attainment of Arizonans. [ABOR]
   
   *UA Strategic Goal*: To provide an unsurpassed, student-centered learning experience led by engaged, world-class faculty and enhanced by a globally diverse student body with 100% engagement. [UA Draft]

   University-level Strategic Goals and metrics under the ABOR Educational Excellence and Access Goal Area thus far identified include XXX.

**OVERALL CALS EDUCATIONAL EXCELLENCE AND ACCESS GOAL**: PRODUCE EMPLOYABLE GRADUATES, WHO CAN DO JOBS THAT DO NOT YET EXIST AND CREATE NEW JOBS FOR THE BEST RETURN ON INVESTMENT NATIONALLY.

**CALS Career and Academic Services 2021 STRATEGIC PLAN**

(Revised 12/2/14)

*Career and Academic Services’ Purpose (1)*: We strive to effectively promote, support, facilitate and guide student and faculty professional growth, development and success within the college, university and greater community by the delivery of quality services and educational experiences.

*Career and Academic Services’ 2021 Vision (2)*: Our graduates are recognized amongst the most highly engaged, competitive leaders in our society.

*Career and Academic Services’ Mission (3)*: We seek to engage and empower our faculty and students by our efforts in recruitment, retention, advising, financial support and scholarship, awards and recognition and career, curricular and faculty development.

*Career and Academic Services’ Shared Values:*
  - Teamwork
  - Students
  - Diverse cultures
  - Positive attitude in thinking
  - Standing by our commitments
  - Quality And Excellence
  - Lifelong Learning
  - Integrity
  - Accountable Responsible Behavior
  - Collaboration
  - Innovation and Entrepreneurship
  - Forward thinking
STRATEGIC GOAL ONE: ENHANCE STUDENT LEARNING OPPORTUNITIES

### Alignment with Strategic Goals

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### A. Current situation and gap between current situation and desired situation

CALS does an excellent job with the current academic programs. However, the following areas are in the early stages of advancing:

- Our global and distance learning options
- Utilizing technologies and developing new technologies that can increase learning opportunities for students
- Providing stronger “hands-on” learning where students participate in “real world” or virtual practical experiences
- Adopting learner-centered approaches that encourage students to take responsibility for their own learning

Gaps exist between current practices in each of these areas and what is possible. Further, the UA strategic plan includes increasing online learners by 10,000 in the coming decade. To remain internally and externally competitive we need to have and execute a plan that will advance each of these areas in CALS, enhancing the undergraduate and graduate experience.

### B. Strategies to achieve goal.

1. Develop innovative curricula
2. Utilize the skills and knowledge of the CALS curriculum committee
3. Bring industry and the community virtually into the classroom to increase their participation in student learning
4. Explore and develop structures for students to participate in Global learning (study abroad, online and exchange opportunities)
5. Create an engaging student environment within CALS where student participation in clubs, leadership and experiential learning activities is expected as the norm
6. Acknowledge and provide high-ability (honors; honors-eligible) students the opportunity to engage and interact with each other

### C. Actions and Time Period

- Provide increased opportunities for hands on and learner-centered experiences (100% engagement)
- Provide faculty workshops to facilitate ideas for in class hands-on experiences such as incorporation of global activities
- Engage faculty, industry, and community partners through the use of video and podcasts to bring unique environments and experiences into the classroom and to advise on curriculum to meet workforce needs
- Develop certificate programs and merit badges
- Charge curriculum and assessment committee with reviewing curricula within CALS to improve efficiencies
• Establish webpage for intra-college curriculum and assessment committee
• Assist with study abroad program development
• Create a Agri-life Council involving CALS student clubs and organizations
• Encourage formation of a graduate student organization or council and facilitate TA training

D. Inputs needed to achieve the goal
• Faculty/Appointed Personnel with expertise in various areas to help with workshops/curriculum
• Acknowledgement of faculty/appointed personnel who participate as club advisors, experiential learning, etc.
• Industrial contacts
• Creation of certificates and badges
• Formation of an advisory board
• Maintain website

E. Objective metrics that will be used to track progress towards attaining goal
• Measuring the number of: student internships, revised curricula, new courses, industry contacts and relationships, faculty workshops and attendance, study abroad certificates and merit badges
• Number of honors programs and participation
STRATEGIC GOAL TWO: IMPROVE LEARNING AND CAREER DEVELOPMENT INFRASTRUCTURE

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A. Current situation and gap between current situation and desired situation
Academic Programs is currently housed in 2 separate offices with limited space for students. Because of this space limitation, we cannot increase and promote student learning and career development effectively. Through the development of a CALS student center with some study areas and technologies, we could be much more effective in message delivery. Ideally, the CALS academic advisors and career center will be adjacent for increased visibility and accessibility. Students would be able to identify with a “home” in CALS by having a common place to visit.

B. Strategies to achieve goal
i. Provide space for students with some technology
ii. Modernize classrooms (to make more interactive)
iii. Explore opportunities for developing satellite education centers
vii. Create a structure to support Leadership, Communication and Education to prepare students for careers

C. Actions and Time Period (Fiscal Years)
• Work with E.C. and Dean to identify and renovate space in Forbes
• Promote a dynamic friendly receptive learning environment
• Give an annual open house to meet and engage students in CALS
• College-wide upgrade of classrooms and laboratories
• Increase infrastructure for virtual classrooms and labs
• Conduct surveys electronically rather than on paper

D. Inputs needed to achieve the goal (not limited to financial)
• Money for renovation of space and equipment
• Staff interaction

E. Objective metrics that will be used to track progress towards attaining goal
A. Number of students using the student center
B. Number of students engaging in career development in CALS and UA Career Services
C. Use of modernized classrooms

Notes
Future strategy to improve learning is to use student center for some limited tutoring and student workshops
STRATEGIC GOAL THREE: DEVELOP FINANCIAL SUPPORT FOR CAREER AND ACADEMIC SERVICES

Alignment with Strategic Goals

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A. Current situation and gap between current situation and desired situation
CALS has many donors who have given generously to our scholarship fund. These funds benefit hundreds of students each year; however they do not give flexibility of use in other programs. While maintaining our strong scholarship base, academic programs sees the need for financial support of other CAREER AND ACADEMIC SERVICES. Examples of this include funding and maintaining a student center (Goal 2), funding for materials for recruitment, funding for programming to ensure retention and academic success of our students.

B. Strategies to achieve goal.
   i. Use the new logo and develop branding for the CALS undergraduate and graduate academic programs
   ii. Website development for improved use interface and recruitment
   iii. Working with Alumni
   i. Explore and capitalize on educational grant opportunities
   ii. Develop a marketing plan and strategy
   iii. Identify and engage possible appropriate donors

C. Actions and Time Period (Fiscal Years)
   - Update all items using new logo
   - Fundraising link
   - Make website more user friendly and informational
   - Develop an app - for CALS Academic Programs
   - Engage CALS alumni in the classroom
   - Fundraising with CALS and UA alumni association; rethink post-marketing plan

D. Inputs needed to achieve the goal (not limited to financial)
   - Technology and creative development
   - Cooperation with the Alumni and Development office
   - Alumni input

E. Objective metrics that will be used to track progress towards attaining goal
   A. Amount of dollars donated
   B. Amount of dollars obtained through grants or other sources
STRATEGIC GOAL FOUR: ENHANCE CAREER DEVELOPMENT

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A. Current situation and gap between current situation and desired situation
Career and Academic Services has a strong working relationship with UA Career Services Center. However, due to the wide range of unique majors in our college, there needs to be a greater effort put forward in engaging our students in career exploration and experience. This includes working with departments to develop more structured programs for internships, leadership development and other programs that will make our students more competitive in the industry.

B. Strategies to achieve goal
i. Increase knowledge of opportunities to students for post-graduate employment
ii. Work with the units and industry to increase numbers of available internships and to create industrial and service 100% engagement opportunities for students
iii. Increase opportunities for developing leadership, communication and problem solving skills
iv. Work closely with the University Career Services Center

C. Actions and Time Period (Fiscal Years)
- Increase industry contacts
- Form an industry and alumni advisory council to support the career center
- Promote internships and experiential learning opportunities
- Increase student connection with UA career services
- Provide and develop opportunities for students to meet employers
- Coordinate with Career fair
- Provide a student space for the career center
- Offer a curricula targeted at developing career skills defined by CALS student goals
- Define competencies for the career skills and implement incorporation of the competencies into student training
- Work with UA Career Center to update career brochures
- Get all students to use Linkedin; use Linkedin to engage students through class assignments, and continue contacts through CALS alumni message boards

D. Inputs needed to achieve the goal (not limited to financial)
- People
- Contacts with employers

E. Objective metrics that will be used to track progress towards attaining goal
A. Through the use of graduating and post-graduation surveys, obtain employment information from graduates  
B. Employer feedback regarding students they hired (preparedness, leadership ability, etc.)  
C. Number of internships participated in by our students  
D. Number of students using career services
STRATEGIC GOAL FIVE: EXPAND INNOVATIVE EDUCATIONAL PROGRAMS

Alignment with Strategic Goals

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A. Current situation and gap between current situation and desired situation
CALS has excellent relationships with many Arizona Community Colleges, especially in Yuma at Arizona Western College and in Casa Grande at Central Arizona College. We have established many 2 + 2 programs and some, as in Yuma, are completed mostly via distance by online course offerings. However, we have extensive expansion capabilities with regard to distance education programs and other innovative educational experiences.

B. Strategies to achieve goal.
   i. Increase collaboration with Global and Student Affairs
   ii. Explore, develop and enhance relationships with community colleges
   iii. Increase distance education degrees and programs
   iv. Explore and develop new structures for degrees while maintain quality of degree programs
   v. Apply to the Office of Instruction and Assessment for grant monies available for building online and hybrid courses

C. Actions and Time Period (Fiscal Years)
   • Develop certificate programs
   • Increase online courses for seamless transfer to the U of A
   • Increase opportunities for transfer student participation in CALS
   • Improve structure for multi-venue delivery
   • Faculty workshops on online learning course development and social media
   • Create branded templates for online courses
   • Develop and implement 2 + 2 and 3 + 1 strategy for course offerings for distance learners (applied degrees)
   • Create a model and infrastructure for co-convening of classes locally, nationally and globally
   • Create fully online degrees
   • Create programs to be offered in a bi-lingual format
   *See Appendix A: CALS-CAS Distance and Global Initiatives: A Five-Year Plan for more detailed information

D. Inputs needed to achieve the goal (not limited to financial)
   • A person partially or wholly dedicated to this effort
   • Faculty willing to learn and participate in distance programs
   • Financial assistance to help with technological aspects
E. Objective metrics that will be used to track progress towards attaining goal
   A. Number of courses or programs offered
   B. Number of courses converted to online or hybrid
   C. Number of faculty participating in distance education programs
STRATEGIC GOAL SIX: ENHANCE CALS RETENTION

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A. Current situation and gap between current situation and desired situation
Student retention initiatives works collaboratively with recruitment, career development, and student services overall; but they all have distinct areas to build upon. For these proposed actions, still a work in progress, the CAS team will work collectively to assure we are consistent with our mission and vision of student outcomes. CAS will also work with the academic units’ professional and faculty advisors to strengthen the retention student programs they have in place. We will utilize best practices to potentially offer programs to all CALS students. Our retention (82%) is slightly higher than the University as a whole, but our goal is to increase that to at least 85% by 2021. Our in-migration has traditionally been much higher than our out-migration. However, this is not reflected in the retention rate because migration is not tracked along with the freshman cohort and several programs in CALS are pre-programs without a specific freshman cohort.

B. Strategies to achieve goal.
   i. Update Retention Plan
   ii. Strengthen the relationship with department and school academic advisors
   iii. Continue to develop programs for probationary or “at-risk” student populations
   iv. Continue to develop programs for new freshmen and transfer students

C. Actions and Time Period (Fiscal Years)
   • Work collectively to develop new retention plan
   • Implement retention plan
   • Continue to provide programming for at-risk students

D. Inputs needed to achieve the goal (not limited to financial)
   • Advisors, staff and faculty, campus partners
   • Students

E. Objective metrics that will be used to track progress towards attaining goal
   A. Retention rate of CALS students
   B. Number of students on probation
   C. Graduation rates
   D. Migration rates; freshman cohort relative to degrees
STRATEGIC GOAL SEVEN: PROMOTE FACULTY EXCELLENCE

Alignment with Strategic Goals

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A. Current situation and gap between current situation and desired situation
Faculty excellence can be promoted by supporting sabbatical training, improving the Promotion process and by recognition of faculty with regards to teaching. There are three awards currently given for instruction: Bart Cardon Award for Sustained Excellence in Teaching, Early Teacher, and the David E. Cox Teaching Award. However, very few apply for these awards. In addition, the Bart Cardon Teaching Academy sponsors faculty enhancement workshops which are marginally attended. Our goal is to continue offering teaching workshops and increase the number of participating faculty. This will also aid these instructors in the Promotion and Tenure process. Additionally, we strive to increase the number of applications for the teaching awards so that recognition may be given to our faculty for their excellence in teaching.

B. Strategies to achieve goal.
   i. Develop increased recognition for instruction in CALS tenure and continuing process
   ii. Sponsor faculty development workshops
   iii. Increase the involvement and resources of the Bart Cardon Teaching Fellows

C. Actions and Time Period (Fiscal Years)
   • Under the leadership of Dr. Dennis Ray, develop each year’s workshop topics
   • Offer teaching workshops to faculty and possibly graduate students
   • Increase the visibility of the teaching awards to increase the number of nominations each year
   • Encourage sabbatical training
   • Define guidelines for advancing Professor of Practice

D. Inputs needed to achieve the goal (not limited to financial)
   • People
   • Limited financial support from the Bart Cardon Teaching Academy endowment
   • Faculty involvement

E. Objective metrics that will be used to track progress towards attaining goal
   A. Number of faculty who are nominated for teaching awards
   B. Number of faculty who attend workshops
   C. Number of workshops offered
   D. Promotion and tenure of new faculty
STRATEGIC GOAL EIGHT: ENHANCE CALS RECRUITMENT

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Produce employable graduates, who can do jobs that do not yet exist and create new jobs. Be the most sought-after place to be a part of.

A. Current situation and gap between current situation and desired situation
CALS recruitment is strong with one person and our college ambassadors dedicated to this effort. Our numbers of incoming freshmen and transfer students continue to increase each year. We need to continue these recruitment efforts with emphasis on the under-enrolled majors, or in those areas with room to grow.

B. Strategies to achieve goal
   i. Development an innovative, low cost and strategic recruitment plan

C. Actions and Time Period (Fiscal Years)
   • Use college ambassadors for recruitment
   • Increase visibility of CALS to high school and community college students
   • Explore the potential opportunities for speaker series developed in multiple venues at community colleges
   • Explore the opportunities of increasing classes for high school students, including on campus summer programs as well as using online and virtual technologies
   • Work with the academic units to advance recruitment efforts

D. Inputs needed to achieve the goal (not limited to financial)
   • Advisors, staff and faculty, campus partners
   • Students
   • Admissions Counselor(s)

E. Objective metrics that will be used to track progress towards attaining goal
   A. Number of incoming freshmen and transfer students
   B. Number of students recruited through special efforts such as FFA
Appendix A: CALS-CAS Distance and Global Initiatives: A Five-Year Plan

1) Create Branded Templates for Online Courses
   a. Templates will provide students with a sense of consistency for online classes across the college.
   b. Templates will aid instructors in preparation and conversion of classes to an online format.
   c. Templates will serve as a reference for quality.
   d. Templates will be available in various layouts to accommodate different class designs and formats.
   e. Allow for standardized syllabus and assessment.

   Execution: Evaluate needs of faculty and class formats. Work with instructional designers to provide a portfolio of templates that will enhance their ability to teach online. Additionally, work with graphics to create a branded CALS banner for use in the learning management system.

   Time Frame: 6 months-1 year.

2) Develop and implement 2+2 strategy for course offerings for distance learners.
   a. Complete survey of currently offered CALS “conventional” 2+2 programs among local community colleges.
   b. Determine which conventional programs could be converted to online 2+2.
   c. Work with departments to convert conventional classes for online 2+2.
   d. Establish 3+1 program model (2 years C.C., 1 year online, 1 year residence).
   e. Establish distance collaborative learning to complete degree at distance site.

   Execution: Work closely with CALS advisors in departments to develop a pathway. Contact community college partners and actively seek out partnerships in community colleges to assess student needs and viability. Identify programs that are well positioned to provide offerings.

   Time Frame: Complete evaluation 6 months-1 year. Complete program 2-3 years.

3) Create a model and infrastructure for co-convening of classed locally, nationally and globally.
   a. Classes can be convened at a distance and online. For example, class will be held on UA campus live (Tues.), broadcast to remote site. Remote site classes held live (Thurs.) and broadcast to UA. Both sessions available online.
   b. Create classrooms capable of providing such infrastructure.
   c. Work to provide platforms for support.

   Execution: Identify well-positioned programs with need for such delivery to implement. Work closely with CALS advisors to develop pathways. Identify avenues for funding to outfit classrooms with the technology needed to co-convene courses. Bogner and CCT.

   Time Frame: 2-4 year.

4) Create fully online degrees using NSC as a model.
   a. Nutritional Sciences degree, 3+1 (2 years @ C.C., 1 year online, plus 1 year in residence), 2+2 and fully online. 2+2 is currently in place so can move toward fully online. Jackson.
   b. Global Trade.
   c. Minor and Major.
d. General Studies (FSHD), Angela Taylor and Jim Hunt.

*Execution:* Identify well-positioned programs to implement. Work closely with CALS advisors to develop pathways. Work with CAS to identify most likely candidate for full offering. Contact community college partners. Work within “Academic Incubator” as needed, where courses are initially housed to allow new program development. Incubator will capture a portion of revenue to create funds for further program development. If the model proves fruitful could be used as boilerplate for future online M.S./M.A. degrees.

*Time Frame:* 1-5 year span. First Program by Spring 2016, and continue to develop courses subsequently.

5) **Create programs to be offered in a bi-lingual format.**
   a. Create a series of courses in Spanish.
   b. Convert and offer in Spanish.

*Execution:* Work with partner universities to convert classes to be co-offered or co-taught. NSC class in Nutrigenomics will be converted first, then NSC Minor. Identify other programs where conversion is beneficial.

*Time Frame:* 1-5 year. First class conversion is underway. Conversion will continue.
Appendix B: Strategic Goals Summary ABOR, UA, CALS, CAS
2. **Research Excellence**: national research prominence for Arizona University System with peer rankings of top American research universities. [ABOR]

*UA Strategic Goal*: To create distinctive and internationally recognized contributions to the advancement of fundamental knowledge and scholarship and to the solutions of the world's most pressing grand challenges. [UA Draft]

University-level Strategic Goals and metrics under the ABOR Research Excellence Goal Area thus far identified include XXX.

Colleges will want to develop their own college level Strategic Goals and Strategic Plans to support the university goals within this ABOR Goal Area and tie their plans to the ABOR metrics which support this goal.

Colleges may perhaps want to develop additional Strategic Goals and Areas within this Core area, as appropriate.

College level Strategic Plan and Goals should include specific metrics: i.e. College will achieve XXX by XXX.

**Research Excellence: UA Focus Areas of Excellence**

Colleges should also tie their Research Excellence Goals and Strategies to the University-level Academic Focus Areas, which have been identified as:

- **Biological and biomedical systems**, with special emphases in translational and clinical health sciences, bioinformatics, and biotechnologies;
- **Environment and sustainability**, with special emphases in water, climate, energy, arid lands, policy, and sustainable design;
- **Space sciences and related technologies**, with special emphases on leveraging our strengths in the physical sciences to expand cross-college collaborations;
- **Technology and society**, with special emphases on information and data science ("big data"), information management, transport, and security, as well as digital cultures and access, human interfaces and autonomous/robotic systems;
- **Global impact**, with special emphases on international, transnational and area studies as well as world literatures, languages, histories and arts;
- **Regional roots**, with special emphases on Southwestern cultures and borderlands, as well as professional education, workforce development and community engagement.
OVERALL CALS RESEARCH EXCELLENCE GOAL: DOUBLE RESEARCH BY 2020 ON CURRENT RESOURCE BASE.

STRATEGIC GOAL ONE:
BUILD ON EXISTING RESEARCH STRENGTHS

A. Current situation and gap between current situation and desired situation:
Our decreasing budget and decreasing funding rates require that we focus our investments in areas in which we can be disproportionately competitive and successful. We already have key areas of strength and should more effectively leverage prior and nascent successes to expand research, outreach and education. Specifically we need to (i) evaluate diverse characteristics to define programs as excellent/strong, functional/promising, or unlikely to yield a significant financial or other meaningful return on investment; (ii) develop strategies to move programs from the latter categories to the first, or re-evaluate investment; and (iii) support programs with demonstrable return or promise for growth. We will be best served by vertical integration (research translation), which is needed to foster growth.

B. Strategies to achieve goal:
   i. Develop metrics to recognize research success.
   ii. Incentivize research productivity & extramural grant success by recognizing achievement through promotion, technical support, formalized merit processes and increased salaries.
   iii. Position CALS units to address emergent opportunities efficiently and effectively.
   iv. Prioritize funding that leverages existing and prospective project opportunities (e.g. National Children’s Study; iPlant).
   v. Promote CALS leadership in UA-wide and multi-institutional initiatives.
   vi. Develop approaches to link Research with Instruction, Extension, and Outreach in ways that will excite federal funding agencies and facilitate research productivity.
   vii. Encourage units to fill needed expertise niches within established teams to build foci of excellence.

C. Actions
   • Convene interdisciplinary research centers / institutes under Assoc. Dean for Research.
   • Construct and facilitate teams in the 4-6 areas of greatest potential for large-scale funding. Name a lead individual on each activity; provide resources for meetings; provide proposal support and coordination (pre-award) for submission of large grants.
   • Invest personnel support (i.e., technicians, graduate students) in successful research programs, especially for bridging purposes.
   • Provide buyout of teaching or other responsibilities for promising lead faculty preparing large, collaborative grant proposals.
   • Mentor junior faculty on identifying appropriate funding targets and grant submission; provide support for meetings with program officers/managers from federal funding agencies (e.g., provide $1k / yr for 2 years for junior faculty to go to D.C.; bring along a senior faculty member or administrator). Monitor the Return on Investment (ROI).
   • Mentor mid-career faculty and facilitate their transitions to new research areas with greater funding potential. Consider a mid-career start-up package to re-invest in faculty needing some assistance. Monitor the ROI.
• Create an awards strategy for faculty and staff to honor significant accomplishments throughout careers. Identify existing CALS and UA awards and "missing" award opportunities; nominate CALS faculty for UA-wide awards.
• Develop theme-based, college-wide discussions / colloquia.
• When permitted by the funder, consider encouraging faculty to budget a portion of academic year salary release in addition, for example, to summer salary coverage.
• For faculty whose performance merits pay increases, exchange salary increase with reduction in state-committed FTE adjustment. For example, CALS and faculty agree to 5% salary raise in exchange for reduction in state-supported salary to .95 FTE. For faculty who regularly have extramural funding, this exchange would be low-risk – and for all faculty this could incentivize extramural funding productivity.
• Establish bridge funding mechanisms to temporarily maintain successful grant-funded programs that have had adverse grant funding decisions. Allow for the continued collection of data and resubmission of proposals.
• Institute merit based reinvestment packages at 6-year reviews.
• Broaden promotion and tenure guidelines to include intellectual property (IP).

D. Inputs needed to achieve the goal:
• Agreement among CALS units to transfer time from unit-specific to cross-cutting colloquium activities.
• Allocation of CALS internal competitive funding sources for application to teaching buyouts and merit-based support (RAs, technicians, etc.).
• Identification of CALS faculty leadership in priority research themes and high ROI areas.

E. Objective metrics that will be used to track progress towards attaining goal:
• Temporal trend in number and total dollar amount of CALS-led, multi-investigator research grants.
• Trend in number and impact of publications in research theme areas.
• Change in effectiveness of integrated outreach and public education programs on CALS research (i.e., Research translation/Extension), including measured outcomes and impacts.
• Increase in number of programmatic M.S. and Ph.D. degrees conferred, and postdoctoral scholars trained, as all are important component of research excellence and productivity.
• Annual increases in IP activity and patent achievements.
STRATEGIC GOAL TWO:
IDENTIFY AND INVEST IN CALS RESEARCH INFRASTRUCTURE NEEDS

A. Current situation and gap between current situation and desired situation:

1) Grant submission systems (GSS): Some units have highly qualified staff to assist with GSS while other units have little to no qualified staff to assist with grant submissions. In addition, the current GSS emphasizes regulation rather than facilitation. The desired situation is that all units have access to highly qualified service-oriented GSS office or staff to assist faculty with pre-award processing.

2) Physical infrastructure (PI): Some units or parts of units have state-of-the-art facilities while others are in need of refurbishing (buildings, equipment, and systems). The desired situation is that the physical infrastructure of all competitive units be updated to be on par with or exceed that of our peer colleges.

3) Human capital (HC): Many of the best and brightest graduate students go elsewhere due to a number of limitations as UA, such as comparable state-of-the-art physical infrastructure, competitive assistantships, service-oriented and facilitative staff. The desired situation is to make CALS THE place to go for top US and foreign graduate students that would otherwise go to institutions like UC Davis, Wisconsin, Cornell, etc.

4) Reporting systems [RS] (i.e. APROL, AES, CHRIS, time reporting, time approval): Many of the CASLs reporting systems listed are inefficient and time-consuming to complete. The desired situation is to significantly improve/overhaul the CALS RS with the goal to focus on usefulness and accessibility for planning and analysis and to reduce administrative load on PI’s that interferes with productivity.

5) University level investment (ULI): The rate of return of IDC to CALS, individual units, and faculty is not clearly understood and lacks vision when a significant opportunity or initiative arises (e.g. iPlant). The desired situation is the distribution of IDC be more flexible with the goal to maximize and incentivize return on investment.

6) In all issues identified, streamline/flatten processes to maintain or reduce the number of steps to accomplish research goals

B. Strategies:

Grant submissions systems (GSS)

i. Perform a college-wide re-evaluation of CALS’ grant submission systems. Some options to consider would be to: 1) move all pre and post-award management of federal grants under one roof, led by the Associate Dean for Research; 2) move all pre-award grant management under one roof (above); and 3) Retain post-award management at the school/departmental level, but support capacity building and expertise for business office staff to collaborate and build a culture of facilitation rather than regulation.

ii. Develop infrastructure for the writing and submission of large-scale, high-impact, team projects.

iii. Ensure that CALS’ grants can be budgeted in such a way that they are the most competitive at review.
iv. Coordinate faculty across and off campus, develop management plans, and making proposals look professional (much beyond the single investigator grants). ASU does this as do other Colleges of Ag, National Labs, and others.

v. Build capacity of CALS researchers to ID funding resources efficiently.

vi. Examine each strategy and tactic associated with this goal and audit processes to insure that the number of steps to complete an activity is either maintained or reduced.

Physical infrastructure (PI):

i. Identify specific equipment/space needs in CALS for today’s and tomorrow’s research, build competitive teams who do and will use these facilities, and seek federal and or private funding to secure the required need (e.g. Major Research Equipment grants, and the like).

ii. Minimize investment on depreciating equipment, aim to have equipment worn out before it becomes obsolete and use contractors when services have become commoditized.

iii. Offload to the private sector services and equipment where private sector efficiencies exceed and costs are reduced compared to our own.

Human capital (HC):

i. Obtain stable funding for graduate students beyond the first year of study (TA/RA positions, fellowships, scholarships). Develop an endowment for graduate student support, specifically to target U.S. students in highly competitive areas.

ii. Identify potential graduate research topics of overarching themes and pursue coordinated funding (IGERT). Consistently put strong proposals into such VPR-screened programs.

iii. Invest funds to recruit students in a manner that will be competitive with peers across the U.S. Some competing programs across the U.S. are able to guarantee 4-5 years of support for each graduate student recruited.

iv. Re-evaluate FY13 graduate student ERE rates and devise creative/alternative ways help fund graduate students.

v. Provide technical support for productive Principle Investigators. Support technical staff with opportunities for training, graduate studies, and/or regular promotion opportunities.

Reporting systems [RS] (i.e. APROL, AES, CRIS, time reporting, time approval):

i. Review needs and functionality of forms and procedures related to: APROL; AES Project Reports; Hatch Project reviews; UA time reporting and approval; UA Financials. Revise/eliminate/combine as appropriate.

University level investment (ULI):

i. Advocate for UA-wide improvements and accountability in SPS and ORCA, and other contracting authorities of the UA.

ii. Develop a research strategic planning advisory committee that will determine how IDC funds should be spent in order to take full advantage of existing talent and current and
future opportunities. The committee will also be charged with identifying current and new opportunities in consultation with CALS units.

C. Actions:

Grant submission systems (GSS):
- Establish an effective process for collecting and distributing notices on new Requests for Funding.
- Institutionalize regular research PI orientation/training to cover topics relevant to all PIs (new and established), including topics such as grants.gov, grant alert databases, best practices in federal grant submission. Record sessions and post to website.
- Computerize all routine grant forms to save investigator time for major agencies (such as COI forms, routing form, CV generation etc.).
- Employ a programmer to build automated grant form completion.
- Track research submissions as well as funded proposals and measure submission and success rates.
- Develop e-signature systems acceptable to all levels of the University.
- Reform procedures so as to minimize the number of steps between the PI and the grants submission process. [if departments/schools and CALS are not reading proposals, then eliminate pre-award signature steps in favor of e-procedures that inform units & CALS as a proposal moves through the system.]
- Reduce unit barriers to collaborations by creating responsibility for a proposal in one unit (and not require additional approval steps in every collaborating unit).
- Survey CALS and other Colleges at UA to determine optimal procedures for reform of CALS GSS.

Physical infrastructure (PI):
- Develop a physical infrastructure plan for CALS.
- Develop methods and mechanisms for time sharing and access to equipment and facilities currently in the college.
- Adopt a culture in CALS “if an instrument is not being used 24/7 we don’t need a new machine”.
- Develop methods and mechanisms for time sharing and access for contracted services outside of CALS.

Human capital (HC):
- Write cross cutting/translational graduate student training grants.
- Work with the development office to find support for cross cutting/translational graduate student training grants.
- Enable graduate students after their comprehensive examinations (a point where they are no longer taking classes and so do not need full tuition, BUT grants are still charged full
ERE) to be charged less than full ERE. (The UC system does this. The fee before passing the exam is termed an “education fee” and is no longer paid once the oral exam is passed).

- Develop a CALS fellowship program that will guarantee 3 years support for a Ph.D. and 2 years of support for M.S. students.
- Start to rebuild technical support capacity by supporting current technical staff in productive laboratories and identifying PIs who would benefit from stable technical support.

Reporting systems [RS] (i.e. APROL, AES, CHRIS, time reporting, time approval):
- Revise/eliminate/combine as appropriate.
- Establish team-based Hatch Projects that cut across the entire college and convert the majority of single PI Hatch projects to multiple and/or team-based Hatch projects.

University level investment (ULI):
- Advocate for UA-wide improvements and accountability in SPS and ORCA, and other contracting authorities.

D. Inputs needed to achieve the goal:

Grant submission systems (GSS):
- A report on how top peer institutions perform pre and post-award grant submissions and administration in order to provide advice on how to improve CALS’ GSS.
- Written and verbal input from unit heads on pre and post-award processing on what works and what doesn’t in order to provide advice on how to improve CALS’ GSS and to develop an action plan to remove any and all GSS bottle necks.
- Input from faculty, peer institute surveys, and federal agencies for need to establish a BIG Idea/ Grand Research Challenges grant office to promote strategic planning and entrepreneurship across the college, and to identify large sources of funds that CALS and its partners can compete for and/or tap into.

Physical infrastructure (PI):
- An annual report from unit heads identifying current and future space/equipment needs that is ranked based on competitiveness of the group and for the potential success.
- A biannual report that identifies federal and private funding sources that can be applied for to fund CALS physical infrastructure needs.

Human capital (HC):
• A report, in collaboration with the business school, that predicts the Arizona, US and International job outlook for the next 5, 10, 15, 20 years and beyond, and outlines research foci and degree programs based, in part on, on these studies.
• An annual report from units heads outlining plans to submit graduate student training grants (Federal or private).
• In CALS funding priorities, balance investments in technical support and graduate student support for current faculty with new hires.

Reporting systems [RS] (i.e. APROL, AES, CHRIS, time reporting, time approval):
• A report from all units describing the good, bad and ugly about RS, and creative solutions aimed at streamlining RS.

University level investment (ULI):
• Formation a research strategic planning advisory committee that is charged with determining how IDC funds should be spent in order to take full advantage of existing talent and current and future opportunities. The committee will also be charged with identifying current and new opportunities in consultation with CALS units.

E. **Objective metrics that will be used to track progress towards attaining goal**

Grant submission systems (GSS):
• More proposal submissions (50% more within 4 years)
• Greater number of awards (25% more within 3 years, 50% more within 8 years)
• Greater number of large awards (15-25 million range), 1-2 every 2-3 years)
• Input from GSS customer satisfaction surveys aimed at continuous improvement and optimization of the CALS’ GSS.

Physical infrastructure (PI):
• Complete CALS maker over within 10 years
• Successful MRI/NIH research equipment grants – 1 every year

Human capital (HC):
• One federal and or private graduate student training grant every 2 years
• Doubled number of PhD in 5 years
• Quadrupled number of Masters and Professional Master degrees in 5 years

Reporting systems [RS] (i.e. APROL, AES, CHRIS, time reporting, time approval):
• A clean and efficient RS in 1 year or less
University level investment (ULI):

- Committee formed to determine how IDC funds are spent. We should have a goal that for every IDC dollar invested CALS will receive 10 dollars in return.
STRATEGIC GOAL THREE:
DEFINE AND MEASURE PRODUCTIVITY AND RESOURCE GENERATION FOR RESEARCH

A. Current situation and gap between current situation and desired situation:
Our charge from ABOR is to double extramural funds by 2020. This means doubling extramurally funded scholarship along the continuum from discovery to extension and teaching. We also need to define the indicators of scholarship productivity and resource generation that we plan to grow and quantify it. Relevant metrics, in addition to those set by ABOR, include: number of Masters and PhD degrees; publications and impact factors; extramural funds; IDC; faculty and team awards; % co-investigator / co-PI grant submission awards.

B. Strategies:
   i. Use ABOR and UA metrics to identify what we will measure, and track research productivity using these.
   ii. Ensure that all academic units can define and quantify what it means for them to double research productivity.
   iii. Based on those metrics, calculate and track Return On Investment (ROI) in research at the individual and academic unit level.
   iv. Minimize teaching, especially undergraduate, for research-intensive faculty; reassign research / teaching based on faculty strengths.
   v. Ensure that CALS invests in research areas consistent with those at the level of the university—currently “Big Data”, Information sciences, Environment, Biomedicine
   vi. Because many large grant programs favor inclusion of a range from discovery to application, evaluate and assess the balance of fundamental and applied research across the college.

C. Actions
   • Survey CALS administrators, faculty and staff regarding perceived barriers to increased productivity across the research continuum (discovery to extension and teaching) and extramural funding. Develop actions to address identified barriers.
   • Identify metrics for quantification of productivity:
     ▪ Identify / distinguish unit-level and CALS-wide goals
     ▪ Implement tracking methods for metrics, evaluate progress on a regular basis and adjust when necessary.
   • Identify strategies to (a) strengthen the connection between Research and Extension programs, and (b) utilize Extension programs to improve Research and for Research to improve Extension programs.
   • Seek stakeholder input to develop specific long-term goals for supporting and shaping the future economic and social conditions of rural and urban Arizona as a means for understanding how and what best to measure.
   • Implement ROI studies to assess selected CALS program impact(s). Engage AREC or other UA faculty.
   • Align Annual Performance Review (and APROL) with identified metrics, and improve database functions and efficiency so that APR data are accessible and useful.
D. Inputs needed to achieve the goal

- Broad input (faculty; HODs, CEDs; DRAC; Dean’s Council) on priority metrics.
- Administrator, Faculty and Staff input on barriers to productivity and actions to overcome barriers.
- Stakeholder input on future issues and priorities to improve the economic and social conditions across the continuum from rural to urban Arizona.
- Faculty and other expertise for analysis of ROI in programs across CALS.
- IT expertise to revise / renew APROL to achieve efficient, accessible, useful tracking data on metrics.
- Flexibility for incentives / rewards for individuals and teams / units that have high ROI

E. Objective metrics that will be used to track progress towards attaining goal

- CALS units (including college level Associate Deans-Research, Extension, Instruction, Administrative Services) will have clearly identified metrics and tracking for research productivity and resource generation in place for AY2013-14.
- Usefulness of the outputs of tracking of unit-level and ABOR-identified metrics.
- Identifiable and measured contributions by CALS to improved economic and social conditions in Arizona.
STRATEGIC GOAL FOUR: EXPAND COMMUNICATION ON RESEARCH ACTIVITIES

A. Current situation and gap between current situation and desired situation:
Areas of communication in need of expansion can be divided into outward and inward communication. We need to promote our research activities outside the university setting to communities, stakeholders, and potential donors. A critical part of outward communication is public outreach programs. Inward communication is designed to highlight research strengths among CALS faculty. This is critical for the development of new collaborative projects and identifying extra-CALS partnerships, and for promoting our current strengths.

B. Strategy:
   i. Improve outward communication.
   ii. Improve inward communication
   iii. Recognize outstanding faculty accomplishments

C. Actions
   Outward communication activities:
   • Develop a comprehensive branding strategy for CALS that operationalizes comprehensive recommendations for promoting Research, Extension, and Instruction
   • Coordinate events that highlight areas of excellence in CALS. Publicly identify projects that were supported by strategic investments from development sources (successful examples include the CoS evening symposia for general audiences, the Arizona Insect Festival, UC Davis’ Picnic Day, NC State Innovation Fund).
   • Enhance media exposure of CALS research highlights. Dedicate a section of the CALS web site to communication on areas of research strengths (for example how would an outside entity know what research areas CALS is very strong in?). Connect sources of funding with specific projects and write a paragraph on the impact of these studies. A presence on UA News, and local, regional, and national publications could enhance this effort. Supplement the current CALS research highlights on the home page with pieces for outlets in social media (Facebook, Twitter, YouTube).
   • Expand beyond traditional southern Arizona communication outlets. Invest in direct relationships with Phoenix area media to place stories in the press & multi-media there. Consider partnerships with University of Arizona Medical School, Phoenix campus to help deliver CALS communications especially in areas of overlapping interest (food safety, food security, nutrition, SNAP-Ed, healthy living and lifestyle programs).
   
   Inward communication activities:
   • Encourage the development of new multi-disciplinary teams. Options could include: a) Developing a “Multidisciplinary Monday” program involving a series of meetings and social gatherings around big-picture research, education, and outreach activities centered around specific CALS Big Ideas/Grand Research Challenges and other large, cross-cutting issues of broad interest, b) convene meetings between Institute/Center directors and graduate program chairs within CALS to help connect faculty with similar interests. Explore different formats to see what works best. Include all segments of the land grant mission, potential industry
partners, other UA Colleges, and students.

- Enhance the communication of current research endeavors. Options could include: a) Holding multiple mini-symposia on areas of CALS research strength or areas identified as emerging, b) Units hosting symposia, conferences, or workshops should be encouraged to engage faculty from other Units within CALS. Topic examples could include symbiosis, climate change, food security, or sustainable health. Invite speakers and ensure excellence and relevance so faculty want to come rather than compulsory and resented.
- Develop a “Best Practices” dropdown where Units can post policies and guidelines that could serve as templates for other Units.
- Recognition: CALS communication team should collect the honors and awards list after each Unit’s faculty meeting. Redistribute stories, activities, pictures, blogs, conferences, publications and other outputs as appropriate. Units should be encouraged to nominate their own Faculty and Staff for Society, University, and Foundation awards and honors.
- Culture: Help to create a culture where faculty seek interactions across disciplinary, unit, and other borders. Seek unit heads and CALS leadership that strive to set the example by attending and inviting others to attend events and gatherings where research is discussed, planned, celebrated, and honored.

D. Inputs needed to achieve the goal

- IT and perhaps student worker salaries to increase web promotion of research
- Communication venues currently used by CALS communication team (Are we promoting CALS in all the right markets?)
- Establish faculty (and where appropriate include staff and students) working groups for all these strategies
- Refreshments for events
- Determine faculty interest and feasibility of proposed events to make them ‘can’t miss’ rather than ‘have to go to’ events
- At least one faculty member from each unit charged with identifying honors, research, awards, stories and other achievements of their unit and transmitting them to College wide working groups noted above.

E. Objective metrics that will be used to track progress towards attaining goal

- Attendance at proposed events; publicity and stories about events in media
- Number of stories in the media that exceed southern Arizona exposure (state-wide, regional, or national coverage)
- Feedback from stakeholders, citizens, and potential donors outside the University on their impressions of current CALS research activities
- Hits on web sites, number of follow-on stories on established and online media
- Increase in within-CALS collaborations as monitored by APROL, CALS pre-award staff
STRATEGIC GOAL FIVE:
BUILD TECH TRANSFER, IP DEVELOPMENT, EXTERNAL BUSINESS RELATIONS/DEVELOPMENT

A. Current situation and gap between current situation and desired situation:
We do not have a strong culture of disclosures, tech transfer and business development. Contracting and Intellectual Property development should be transparent to all faculty with easy access to resources, FAQs, and University personnel who can help stimulate resource and IP development that will fuel major advances in research.

B. Strategies to achieve goal:
   i. Build industry partnerships early.
   ii. Reward disclosures and patents at P/C and T.
   iii. Establish clear faculty performance criteria (including entrepreneurship and IP creation).
   iv. Broaden promotion and tenure guidelines to include IP.
   v. Add entrepreneurship and risk-taking to position descriptions (faculty and staff).
   vi. Identify/run workshops that could educate faculty on how to initiate entrepreneurial or IP projects.
   vii. Develop transparency in the array of contracting and external business relations options available to CALS faculty.

C. Actions
   • Work closely with Tech Launch Arizona and the Office of Corporate and Business Relations.
   • Charge contracting organizations of UA and CALS with development of clear, concise, non-technical descriptions of their role and services for faculty use.
   • Develop standard contracting language for addressing CBI when interacting with external businesses that will not need further and/or repeated review including information on the basic protections (in non-legal jargon) that need to be in place for UA to enter into an agreement / contract with an external business unit.
   • Develop CALS based IP/contracting workshops at least once per year that teaches faculty the how-to’s for these processes.

D. Inputs needed to achieve the goal
   • Cooperation & time of contracting units (e.g., ORCA, OTT, Procurement, etc.) to develop outreach and training materials
   • Faculty time and interest to attend workshops
   • Amended APROL (or similar) that highlights and accommodates reporting of patent, entrepreneurial, and other IP related achievements/productivity

E. Objective metrics that will be used to track progress towards attaining goal
   • Trends in patent/IP development
   • Number of faculty reporting patent/IP/other entrepreneurial productivity
   • Dollars/IDC reported from contracts to CALS faculty
   • Workshop attendance and interest in IP/contracting activities
3. **Community Engagement and Workforce Development** research, economic development, and community engagement used to strengthen the economy and improve quality of life in Arizona. [ABOR]

*UA Strategic Goal:* To establish mutually beneficial partnerships with the citizens and institutions of Arizona, the nation, and the world so that our communities are actively engaged in the exciting work of the University of Arizona and to lead Arizona in sustainable economic development. [UA Draft]

University-level Strategic Goals and metrics under the ABOR Community Engagement and Workforce Development Goal Area thus far identified include XXX.

Colleges will want to develop their own college level Strategic Goals and Strategic Plans to support the university goals within this ABOR Goal Area and tie their plans to the ABOR metrics which support this goal.

Colleges may perhaps want to develop additional Strategic Goals and Areas within this Core area, as appropriate.

College level Strategic Plan and Goals should include specific metrics: i.e. College will achieve XXX by XXX.
COOPERATIVE EXTENSION SYSTEM

**Purpose:**
To improve lives, communities and the economy

**Vision:**
Cooperative Extension is a vital national leader in creating and applying knowledge to help people build thriving, sustainable lives, communities and economies.

**Mission:**
To engage with people through applied research and education to improve lives, families, communities, environment, and economies in Arizona and beyond.

**Shared Values:**
Accountability, collaboration, collegiality, diversity, exploration, fairness, innovation, integrity, knowledge-based, lifelong learning, problem-solving, proactive, productivity, responsiveness, sustainability, trust
STRATEGIC GOAL 1:

IMPROVED ECONOMIC SUSTAINABILITY NATURAL RESOURCE MANAGEMENT AND UTILIZATION

A. Current situation
Arizona's increasing population has an enormous impact on vast tracts of public and private land. During the period between 2000 and 2010, Arizona's population increased by just under 25% (US Census Bureau). Suburban development, traditional land uses and other activities all influence natural resources such as: surface and ground water quality and quantity, soil stability, vegetation and wildlife. This rapid urbanization permanently alters natural watershed characteristics. Informed land use decisions are the key to protecting the natural resources, community character, and long-term economic health of Arizona's communities. In addition, land ownership in Arizona is unique with 28% tribal, 42% federal, 13% state and 18% privately owned. The complex mix of land ownership can create challenges in managing natural resources on a landscape level. Changes in environmental conditions (drought conditions for the past 15+ years, wildfires of large size) further complicate decision making regarding natural resources and create an ever changing situation for land managers, producers, and homeowners.

B. Strategies
i. Reassess current program areas for relevancy.
ii. Prioritize programs that meet the changing needs of clientele and the environment. Discontinue programs that show little or no impact. Initiate new programs based on needs assessments.
iii. Develop new/strengthen current partnerships with federal, state, county and municipal governments, NGOs, producers, landowners, private industry and citizens.
iv. Strengthen programming ties between campus and county by using a statewide team approach for common issue based programs.
v. Partner with other state extension systems with similar issues to provide regional programming where appropriate.
vi. Develop electronic/technology tools to compliment programs where not already in place (websites, videos, etc.).
vii. Develop statewide evaluation and impact measures for common programs (examples: forest health, rangeland monitoring, water conservation, small acreage landowners, and noxious weeds).

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Year)</th>
<th>Perform periodic assessments of needs and issues.</th>
<th>FY13</th>
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</thead>
<tbody>
<tr>
<td>Identify current key partners and potential new partners and their roles or potential roles.</td>
<td>FY13</td>
<td></td>
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<tr>
<td>Approach possible new partners where it makes strategic sense for a program.</td>
<td>FY14</td>
<td></td>
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<tr>
<td>State support for statewide program teams.</td>
<td>FY13, 14</td>
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<tr>
<td>Explore partnership with other state extension programs.</td>
<td>FY14</td>
<td></td>
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<tr>
<td>Review current electronic/technology tools by program.</td>
<td>FY13</td>
<td></td>
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<tr>
<td>Develop electronic/technology tools to compliment programs.</td>
<td>FY14-15</td>
<td></td>
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<tr>
<td>State support for evaluation person to help with design and implementation of evaluation tools.</td>
<td>Ongoing</td>
<td></td>
</tr>
</tbody>
</table>
D. Inputs needed to achieve the goal
Faculty, staff, partners, volunteers, time, funding, equipment, technology

E. Objective metrics that will be used to track progress towards attaining goal
- Number of people attending programs
- Number of people who report increased subject matter knowledge
- Quantify number of acres impacted
- Results of field trials and monitoring efforts
- Test/quiz scores from on-line courses
- Quantify number of sites monitored
- Quantify number of collaborative planning efforts
- Impact gathered via surveys, evaluations and personal interviews
- Program evaluation tools utilized to measure outputs and impacts
- Program outputs and outcomes are documented and disseminated
- Economic impacts are documented and disseminated
- Funds received from grants and contracts
STRATEGIC GOAL 2: SAFER, MORE PROFITABLE AND SUSTAINABLE FOOD, PLANT AND ANIMAL SYSTEMS.

A. Current situation
Currently we have diverse and segmented efforts to improve this situation across the state. In many cases lack of communication systems and cooperation have hindered efforts to make more meaningful impacts on the lives and communities of our clients statewide.

B. Strategies
i. Develop an engaged and collaborative network of Extension Professionals
ii. Increase marketing of CALS Cooperative Extension Programs
iii. Identify baseline data through needs assessment/situation analyses
iv. Seek funding through USDA and other organizations
v. Develop partnerships with statewide organizations and local governments

C. Actions
<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>Increase departmental buy in by creating win-win opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hire a communications specialist for CALS</td>
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<td>Hire a grant writing specialist for CALS</td>
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<td></td>
<td>Hire an evaluation specialist for CALS</td>
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<tr>
<td></td>
<td>Collect baseline data through systematic and consistent methods across the state</td>
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<td></td>
<td>Increase leadership development training</td>
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<tr>
<td></td>
<td>Train County Extension Directors (CEDs) to work with local government and statewide organizations</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Volunteers to leverage impact of our programs and our work with local governments
- Use of non T/C positions to run local programs
- Formed collaborations with internal and external stakeholders
- Funding

E. Objective metrics that will be used to track progress towards attaining goal
- Track economic progress against baseline data
- Improved agricultural productivity
- Improved agricultural income
- Rising standard of living for Arizona agricultural producers
- Reporting/evaluation systems
STRATEGIC GOAL 3: IMPROVED COMMUNITY ECONOMIC VITALITY.

A. Current situation
Employers want competent employees (both youth and adults) who don’t require additional monies to train and retain. Individuals also need to develop increased evidence of competitiveness to survive and remain nimble in the marketplace.

B. Strategies
i. Engage citizens in community youth development
ii. Promote critical thinking - decision making –
iii. Promote teamwork - consensus building - technology skills
iv. Teach citizens about sustainable resource management
v. Work collaboratively with economic development councils to look at new or alternatives business ventures that could bring jobs to local communities
vi. Provide leadership training to local thought leaders through Project CentRL and other training programs

C. Actions
• Form a team.
• Access existing resources including: FCHS Curriculum, Project CentRL, 4-H Projects, Mentor, Clientele Volunteer Programs: MG, 4-H leaders, KKONA,VISTA/ AmeriCorps/ Internships.
• Develop measures and outcomes evaluations.
• Plan and deliver statewide programs.

D. Inputs needed to achieve the goal
• Personnel
• Skills training and delivery applications that include technology.
• Credits, certificates and other employee/employer valued motivators.
• Time of faculty and staff
• Resources

E. Objective metrics that will be used to track progress towards attaining goal
• Program evaluation tools utilized to measure outputs and impacts
• Number of people attending programs
• Number of people with increased knowledge and skills
• Number of collaborative planning efforts
• Impacts gathered via surveys, evaluations and personal interviews
• Program outputs and outcomes are documented and disseminated
• Economic impacts are documented and disseminated
• Funds received from grants and contracts
STRATEGIC GOAL 4:
GROWTH AND DEVELOPMENT OF ARIZONA CHILDREN AND YOUTH.

A. Current Situation

The research is clear—all young people need the support of at least one caring adult in their lives to thrive and make the successful transition to adulthood as a contributing member of the community. Arizona's high-school graduation rate has risen more than 8 percentage points over 10 years, but it still trails the national average, according to a new report that examined national education trends. Arizona's graduation rate was 68.2 percent in 2007, the most recent year that data were available. The national rate was 68.8 percent. A decade earlier the gap was nearly 6 percentage points.

Arizona students remain the lowest performing in the country in science—an area that many education and business leaders regard as critical to boosting the state’s economic health. “The Nation’s Report Card” report showed that 8th graders improved only slightly from two years ago, and were higher than those in only 5 other states. Forty-four percent of Arizona students lacked basic knowledge of science. Science education has not been a priority in Arizona until recent years. Only in 2007 was science included in the AIMS test.

Although more than 30 percent of the state's Class of 2007 failed to graduate in four years, the state had the fourth-best improvement overall over the past decade, according to the report, "Diplomas Count 2010: Graduation by the Numbers - Putting Data to Work for Student Success."

According to the study, Arizona’s graduation rate for Blacks, Hispanics and Asian-Americans was higher than the national average for the Class of 2007. Nearly 70 percent of Arizona Blacks graduated in four years, higher than in any other state. The national graduation rate for Blacks is less than 54 percent. More than 60 percent of Hispanics in Arizona graduated on time, compared with 55.5 percent nationally. More than 82 percent of Arizona Asian-Americans graduated in four years, while less than 81 percent of Asian-Americans graduated nationally. The graduation rate for White students in Arizona is slightly more than 74 percent, about 2 percentage points lower than the U.S. average. Slightly more than 48 percent of the state’s Native Americans graduated in the same amount of time, while the graduation rate for Native Americans nationally was just above 50 percent.

Only 21% of those over the age of 25 have graduated from college. And college attendance is changing—only 16% of college students are 18-22 years of age. People are waiting longer to enter college or in some cases are returning to college to change careers, and then do so in order to gain specific workforce skills that will help improve their lives and the community in which they live.

B. Strategies

i. First Things First (or early childhood education program) in every county
ii. Out of school youth development and environment programs for all youth
iii. Expanded health and nutrition education programs
iv. Expand STEM education programs
v. Mentoring programs to support academic achievement

C. Action

- Secure outside funding to support staffing—Present through 2021
- Increase 4-H enrollment—Present through 2021
- Expand afterschool programs—2015 to 2021
- Expand volunteer ranks and training—2013-2021
• Expand STEM programming—Present to 2021
• Offer college credit—2015 to 2021

D. Inputs
- staff, faculty, administrative support, volunteers, VISTA, AmeriCorps
- funding
- equipment
- educational programs/resources
- on-campus collaborations
- partners (schools, youth organizations, campus/county, community)

E. Objective Metrics
- kindergarten enrollment
- graduation rates
- test score trends
- dropout rates
- 4-H enrollment data
- truancy data
- number of juvenile justice cases
- STEM education programs offered
- after school programs and enrollment
- employment rate
STRATEGIC GOAL 5:
IMPROVE THE PHYSICAL, MENTAL, EMOTIONAL, AND FINANCIAL HEALTH OF INDIVIDUALS AND FAMILIES.

A. Current Situation
The relationships among food, food safety, nutrition, physical activity, finances, and child, youth and family development and caregiving are key components of good health. Creating and applying solution centered research and education to urgent and growing challenges to human development and health can help guide people and communities in Arizona to better health.

More than one in four Americans have multiple chronic health conditions including, obesity, diabetes, heart disease, and hypertension. In addition to comprising physical health, chronic conditions also include problems such as substance use and addiction disorders, mental illnesses, cognitive impairment disorders and developmental disabilities.¹

The resource implications for addressing multiple chronic health conditions are immense: 66% of total health care spending is directed toward care for the approximately 27% of Americans with multiple chronic health conditions. Increased spending on chronic diseases among Medicare beneficiaries is a key factor driving the overall growth in spending in the traditional Medicare program. Individuals with chronic medical conditions have substantial challenges related to the higher costs of their healthcare.²

Child development is a foundation for community development and economic development, as capable children become the foundation of a prosperous and sustainable society. Creating the right conditions for early childhood development is likely to be more effective and less costly than addressing problems at a later age.² A child's most important developmental years are those leading up to kindergarten. Early childhood education is critical for helping Arizona kids five and younger receive the quality education, healthcare and family support they need to arrive at school healthy and ready to succeed.³

Other than the first year of life, there is no other developmental period during which individuals grow more than during the period of adolescence. The adolescent years are the time to form positive habits that will improve adolescents’ long-term health and wellbeing. Family factors, like siblings being active and support from parents, can help adolescents get and stay active and healthy.⁴

² The Arizona Early Childhood Development & Health Board (First Things First) http://www.azftf.gov
³ The Science of Early Childhood Development National Scientific Council Center on the Developing Child at Harvard University, www.developingchild.net

B. Strategies
i. Integrated healthy living programs (nutrition/food, gardens, food safety and physical activity) with children, youth and adults in every county (Examples – SNAP-Ed, EFNEP, Safe Routes to School, Walk
Across Arizona, Bone Builders, STEM, Connecting Youth with the Outdoors, and Small Steps to Health and Wealth

ii. Integrated programs in early child development and 4-H youth development, kinship/family development & family care, and financial literacy in every county (Examples – Brain Builders & Brain Waves, Oral Health - First Smiles, Family Resource Centers, STEM, Connecting Youth with the Outdoors, Leadership, Healthy Living, Kinship Care/Grandparents Raising Grandchildren, Small Steps to Health and Wealth)

iii. Development and use of innovative curriculums and technology to support programs.

iv. Program evaluation systems

v. Program internal & external public relations/communications focused on program impacts

C. Actions

1. Hire, retain and support professional development of faculty, staff, administrative Leadership Teams to develop, deliver and administer programs (Funding/resource support, implementation infrastructure, public relations and evaluation) 2012 - 2021
2. Increase number of trained volunteers and students to assist Leadership Teams 2012 - 2021
3. Obtain funding (federal, state, county and sponsored grant/contract funds) to support faculty, staff, students, volunteers and operations. 2012 - 2021

D. Inputs needed to achieve the goal

1. Administrative support, faculty, staff, students and volunteers
2. Resources – federal, state and county funds, grants/contracts, cost recovery and gifts
3. Collaborations/partnerships – Federal/State/County Agencies (Health, Education, Economic Security), schools, community organizations, businesses, professional organizations

E. Objective metrics that will be used to track progress towards attaining goal

1. Number of counties/regions with food-nutrition & physical activity, early childhood education, 4-H youth development, Kinship Care and financial competency programs.
2. Program outputs (e.g. number of program activities, participants, clients, agency and decision maker partnerships) and program impacts (short, moderate, long term) (e.g. knowledge, skills, and selected behaviors related to health e.g. kindergarten readiness, high school graduation rates, academic performance, body weight/BMI, critical thinking skills, STEM assessments)
3. Curriculums/publications and technology developed and distribution outputs (e.g. number of products, number of people reached with products, funding generated from cost-recovery sales of products or sponsorship support of products) and impacts (awareness, knowledge, skills, behaviors and societal-economic condition changes)
4. Funding levels for support of programs from grants, contracts and gifts
STRATEGIC GOAL 6:
BE THE KEY LINK BETWEEN THE UA AND ARIZONANS.

A. Current Situation
CALS Cooperative Extension is not clearly understood even across the various units within CALS. Cooperative Extension is commonly misinterpreted and many opportunities are lost for effective programming. This situation is further exacerbated across the UA campus and into the general public. Too many people working in Cooperative Extension assume that their colleagues in CALS and the UA, as well as stakeholders across the state, have a clear and accurate understanding of the Extension mission and function. These assumptions are often erroneous.

B. Strategies to Achieve Goals
i. Every Extension faculty and staff member to have a clear and concise understanding of what constitutes an Extension program and the purpose and objectives in directing Cooperative Extension programs in CALS.
ii. The “Extension message” consistently communicated by all Extension administrators, faculty, and staff.
iii. Extension assertively communicated at every level.
iv. Active advertising to communicate the mission and capacities of CALS Cooperative Extension.

C. Action
• The Extension Director and the EAT group need to communicate and reinforce a consistent message to all facets of the CALS organization, the UA campus, and across the state and region.
• Each Extension faculty member should carry a consistent message forward to all sectors encountered relative to the CALS Extension mission and purpose.
• Every opportunity needs to be seized and utilized for communicating the Extension message.
• Expand volunteer ranks and training that will include a clear understanding of the Extension mission and function.
• An active advertising campaign needs to be developed and implemented to communicate the mission and capacities of CALS Cooperative Extension.
• A course in “Extension education” needs to be developed and taught within CALS.

D. Inputs
- staff, faculty, administrative support, volunteers, VISTA, AmeriCorps, graduate assistants, work-student students
- funding needs to be directed towards effective advertising and marketing
- securing opportunities in CALS, the UA campus, and in the general public of Arizona to communicate the Extension message. This represents a significant investment of time and energy on the part of all Extension administrators and faculty.

E. Objective Metrics
- better coordination and alignment of Extension programs throughout CALS
- levels of engagement with CALS Cooperative Extension from internal and external constituents
- improved public awareness from survey results and comparisons for 2012 and 2021
- funding allocations to Extension
- county level support for Extension
- internal (CALS and UA) support for Extension
- greater interest among students regarding careers in Extension
STRATEGIC GOAL 7:
CALS COOPERATIVE EXTENSION WELL-INTEGRATED THROUGHOUT THE COLLEGE.

A. Current Situation
CALS Cooperative Extension is currently operating on a pattern of individual program orientation, development, and implementation. As a result, some Extension programs are not coordinated with departments, counties, centers and stakeholders. Not only does Extension provide a “face” to the public in a multi-faceted manner that can be counter-productive but it also results in a very inefficient mode of operation considering the college investment in the overall Extension enterprise.

B. Strategies to Achieve Goals
i. Every Extension faculty and staff member needs to have a clear and concise understanding of what constitutes an Extension program and these programs need to be coordinated and openly communicated across all Extension programs in CALS.
ii. There needs to be a clear set of relationships between an Extension faculty member’s position description, the program being carried forward, and a full understanding of the other complimentary programs that are being directed across CALS.
iii. Extension needs to be more consistent and directed in the development and implementation of programs.
iv. Mechanisms for communication and cooperation need to be more fully implemented and managed across CALS.

C. Action
• The Extension Director and the EAT group need to communicate and reinforce a consistent message to all facets of the CALS organization, the UA campus, and across the state and region in terms of the programs we are prepared to deliver and the expectation that programs will be coordinated from among the department, county, and center points of operation.
• Each Extension faculty member should carry a consistent message forward to all sectors encountered relative to the CALS Cooperative Extension mission and purpose and the relevance of their programs in the total context of delivery across the state and region.
• Position descriptions need to be evaluated in relation to faculty “Annual Performance Reports.” There needs to be a clear description of what constitutes an Extension program and the methods of integration that are being put into place.
• The EAT group needs to be active in directing well-coordinated Extension programs across the full spectrum of operation. This needs to be managed with department heads, Extension faculty in departments, County Extension directors, Extension faculty in the counties, and Extension faculty operating from the centers.

D. Inputs
- Extension administration, unit heads, and faculty need to implement regular review and strategic management mechanisms.
- Extension faculty need to be held accountable for the most effective modes of Extension program development and coordination at all levels.
- Extension programs need to fully utilize the capacity to develop and utilize the linkages with stakeholders involved in our many faceted programs to provide an active and productive conduit
for communication back to the college for the best direction in management and identification of strategic objectives.

E. Objective Metrics
- better coordination and integration among Extension programs throughout CALS
- levels of engagement with CALS Cooperative Extension from internal and external constituents needs to facilitate functional and effective “two way” lines of communication
- survey results and comparisons for 2012 and 2021
- funding allocations to Extension should improve over time with enhanced program coordination
- county level support for Extension should improve or at least be strengthened with enhanced and well-coordinated programs
- improved economic impact
- greater continuity among all Extension elements should be evident
- more efficient utilization of all Extension FTEs should be provided from a better level of integration across the system
STRATEGIC GOAL 8:
ASYMMETRIC RESOURCE ALLOCATION IN RESPONSE TO THE GREATEST REGIONAL STRATEGIC NEEDS.

A. Current Situation
CALS Cooperative Extension is often pressured to preserve or maintain positions and program expertise across all regions of the state based on historical or symmetrical expectations. The reality of the strategic needs often highlight the need for certain areas of expertise to be placed or concentrated in geographically related areas. We simply cannot afford to be “all things in all areas.” We need to be more focused and better aligned with respect to geographic needs and the constraints in resources we have available.

B. Strategies to Achieve Goals
i. Regional and strategic priorities need to be assessed and identified for the purpose of placing and directing Extension programs in CALS.
ii. The full body of Extension faculty needs to understand the strategic and regional priorities for the best direction and management of programs.
iii. The strategic and geographical Extension priorities need to be clearly communicated at every level.
iv. An active and continual assessment needs to be developed and implemented to communicate the strategic and geographic priorities of CALS Cooperative Extension.
v. Greater use of non-continuing track (NCT) faculty needs to be implemented to work in coordination with the regional CT faculty.

C. Action
• The Extension Director and the EAT group need to communicate and reinforce a consistent message to all elements of the CALS organization, the UA campus, and across the state and region in terms of areas of need for expertise and the plan for resource allocation and placement.
• Each Extension faculty member should be able to focus and coordinate programs across the CALS Extension system to best address the regional priorities.
• Faculty and staff resources need to be allocated in a manner that is consistent with the strategic and geographic priorities identified.
• Expand non-CT staff and volunteer ranks to best implement and support the Extension mission and function for each area of strategic and regional importance.

D. Inputs
- staff, faculty, administrative support, non-CT expertise, volunteers, graduate assistants, work-study students, VISTA, AmeriCorps personnel need to be collectively placed and directed.
- funding needs to be directed towards the identified areas of strategic and geographic priorities
- securing better funding opportunities in CALS Cooperative Extension by working with the stakeholders and the general public of Arizona should be realized through the focused allocation of expertise to best address the Extension priority areas on a geographic basis.

E. Objective Metrics
- better coordination and alignment of Extension programs throughout CALS
- levels of engagement with CALS Extension from internal and external constituents
- survey results and comparisons for 2012 and 2021
- funding allocations to Extension
- county level support for Extension
- internal (CALS and UA) support for Extension
- greater interest among students regarding careers in Extension
Agricultural and Biosystems Engineering
Agricultural and Biosystems Engineering
2021 STRATEGIC PLAN (1)

ABE's Purpose (2):
ABE develops and facilitates use of innovative technologies for generation of food, bioenergy, and bioproducts, with smart utilization of water, resources, and information, suitable for arid and semi-arid environments. Our faculty, staff, and students work across interfaces between science and engineering.

ABE's 2021 Vision (3):
ABE will be a world leader known for developing technologies and systems for the safe production of food, bioenergy, bioproducts, and biological information for sustainable use of arid and semi-arid environments. Students, constituents, and professionals will come from across the world to participate with our programs.

ABE's Mission (4):
Our mission is to improve the quality of life in the Southwest through excellence in instruction, research, and extension. To achieve this, ABE will provide technologies and information systems for safe and secure food, water, energy, and biological products to adapt to a changing world.

ABE's Shared Values:

- **Excellence**
  Faculty, staff, and students will have academic freedom and our research and educational programs will be of the highest quality.

- **Openness**
  We will communicate openly and treat people fairly because we value the opinions and respect the needs of all.

- **Ethics**
  High ethical standards and sound decision-making will be at the heart of our business and financial practices.

- **Diversity**
  Diverse people, ideas, backgrounds and perspectives produce lasting solutions. We will make it our duty to encourage and help all to be successful.

- **Cooperation**
  We will forge partnerships on and off campus in our drive to solve society’s complex problems and improve the quality of life.
STRATEGIC GOAL ONE: Facilitate the development of the sustainable Bioenergy & Bioproducts Industry in the Southwest U.S. and become the “go-to” place for global development of arid land production of renewable biofuels and bioproducts.

ABE Faculty: Cuello, Giacomelli, Kacira, Poe, Slack, Waller

A. Current situation and gap between current situation and desired situation

Arizona has great potential as a large-scale producer of renewable bioenergy and bioproducts from sugar, oil, green waste, and algal sources. There currently is one full-scale ethanol production facility in our region and we have been working with them to utilize new sources of biomass. ABE’s broad-based research and teaching in this area and its depth of expertise could be leveraged into facilitating the launch of this industry statewide. Arizona could become a model for semi-arid land production of renewable fuels demonstrating responsible use of water, land, and workforce. Utilization of residual biomass is a key step for economic feasibility of the industry. Gap: technology development is close for large use, economic assessments needed, further efficiencies and bioproducts development needed, private sector capital investments needed, workforce development, and broad acceptance from growers and the public.

B. Strategy/ies to achieve goal

1) Build comprehensive teams, engage new partners, build infrastructure.
2) Obtain funding to support activities.
3) Perform innovative research and development and transfer to constituents.
4) Educate students and communicate with the public.

C. Actions

Time Period (Fiscal Years)

Build comprehensive teams, engage new partners, build infrastructure.
1) Build a comprehensive team incorporating research in genetics, cultivation (field, bioreactor, algal raceways), product conversion, byproduct utilization (animal feed and value added products), economics, sustainability, and industrial production. Local partners can include (CHEE, PLS, SNRE, Chem, AREC, NutSci, WEST Center, bio5, SW C for Nat Prod, Solar energy groups; USDA-ALARC, NREL, Sandia NL, Los Alamos NL). FY 12-21
2) Work closely with private sector to expand production of bioenergy and bioproducts, engage Native American tribes and other under-served communities who may grow feedstocks, and cultivate partners who can bring cost sharing / matching funds to support federally funded research. FY 12-21
3) Facilitate on campus infrastructure for pilot-scale production of biofuels (waste cooking oil to biodiesel, algae to biodiesel, sweet sorghum to ethanol) for research, teaching, and extension. FY 12-13
4) Enhance publicity, web presence, and student recruiting. FY 12-21

Obtain funding to support activities.
1) Engage DOE, USDA, NSF, ARPA-E, DARPA; private sector investment; and state and local sources for research support. FY 12-21
2) Work with private sector to facilitate funding from public and private sources for infrastructure. FY 12-21
3) Seek funding for graduate students - National Needs Fellowships, NSF Fellowships, IGERT. FY 12-21

Perform innovative research and development and transfer to constituents.
1) Perform economic impact and technology needs studies in collaboration with researchers, economists, local developers, industry, growers, and others as technology moves forward. FY 12-15
2) Develop technological solutions key to economically viable methods for biomass production and use, incorporate life cycle assessments and systems analysis, for SW arid strategic advantages. FY 12-18
3) Develop, coordinate, and translate research activities into facility, process, and product development with intellectual property (IP) protection based on sound technology and economic and environmental assessments with consideration of impact of climate change. FY 12-18
4) Utilize information systems, genome to phenome methods, near and remote sensing to improve productivity in generating feedstocks while minimizing resource inputs. FY 15-19
5) Develop platforms for production of valuable bioproducts including bioplastics, nutraceuticals, pharmaceuticals, animal feed, for the current environment and in response to climate change FY 14-21
6) Develop platforms for utilization of green waste to recover energy. FY 17-21

Educate students and communicate with the public.
1) Develop a comprehensive educational program including on-line courses for students and practicing professionals with focus on arid land production of biofuels and bioproducts. FY 13-16
2) Develop and strengthen communication channels with constituents, industry, state and local governments, and funding sources to improve public understanding of biofuels and bioproducts. FY 12-21
3) Provide hands on experiences for HS students through college in community service projects, Engineering 102 projects, and lab / pilot projects in bioenergy production to foster development of workforce. FY 13-15
4) Hire Extension specialists in bioenergy to facilitate industry growth and public understanding. FY 14-16
5) Send faculty and UA administrators to Washington D.C. to meet program managers and gain insight; host visits to our facilities in AZ. FY 12-21

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   1) Continuation and expansion of research funding from agencies and industry for bioenergy / bioproducts.
   2) Wider collaboration of faculty, staff, students, industry, especially for bioproducts, species screening / selection, connecting genome to phenome.
   3) Expanded facilities – laboratory, field, pilot scale production.
   4) New graduate assistantships (RA/TA).
   5) Further developed relationships with farmers, processing equipment companies, and fuel production
   6) Deeper relationships with local HS, community colleges, and employers of graduates (pipeline of individuals to jobs).
   7) Faculty lines for research (microbial engineering, machinery) and Extension (biomass processing and utilization)
   8) Collaboration with animal nutritionist, economists, and life cycle assessments.
   9) Increased partnering with solar energy groups on campus (technology and economists) through AZRISE, WEES, and WEST Center.
10) Increased collaboration with ENGR (especially CHEE) in education (and continued in research) for biofuels and bioproducts.
11) Fermentation and bioseparation equipment at intermediate (pilot, 100 L) scale.
12) Assistance with industry relations and facilitated technology transfer.
13) Business-oriented staff to manage projects and facilitate large team proposal submissions.
14) New metrics for faculty productivity providing appropriate credit for technology development / transfer and their work with industry, leading to performance based pay.
14) Training and assistance in improving public relations and web presence.

E. Objective metrics that will be used to track progress towards attaining goal
   1) Total dollars of external funding while maintaining role as integral members of multidiscipline and multi institution projects.
   2) Number of patent submissions and successful patent applications & peer reviewed publications
   3) Number of students taking courses, students in the major, number of graduates, experiences on campus
   4) Number of individuals obtaining extension services and reporting benefit
   5) Number of farmers and total acreage growing bioenergy crops in Arizona
   6) Number of facilities for conversion of feedstocks into biofuels and total gallons produced fuel in AZ / year
   8) Number of new jobs in renewable energy and use of byproducts
   9) Number of graduates (BS, MS, PhD) who gain jobs in this field, especially in AZ.
10) Impact of Extension activities on the human dimensions of biofuel production.
STRATEGIC GOAL TWO: Biological Information and Sensors: Become the center for development and analysis of information-rich applications in agriculture and life sciences.

ABE Faculty: An, Andrade, Billheimer, Cuello, Kacira, Waller, Yitayew, Yoon

A. Current situation and gap between current situation and desired situation

We live in an information-rich age in which measurements can be made on a tremendous number of aspects of living systems. It is becoming clear that having more information is not necessarily beneficial but requires thoughtful design and analysis. The ABE department is unique in having faculty that span a wide range of areas in information-rich topics: fundamental biology, sensor development and deployment, biological statistics (biometry), and utilization of information for better decision making for optimal crop and animal production, human nutrition and health, and environmental protection. The ABE department can play a leadership role in addressing issues that arise in application based information management and to bridge the gap between knowledge and insight especially in support of the private sector. Current thrusts include biosensors, plant health and growth monitoring, biometry, and remote sensing. Opportunities include genomics, bioenergy, biomedical, pharmaceuticals & nutraceuticals, monitoring & control of crop nutritional & phytochemical content, and natural products. **Gap:** larger scale coordination needed, additional faculty and staff resources, and greater length of experience of operations, local expertise in database management. The UA as a whole generates enormous datasets but is ill prepared to utilize this information. We can facilitate the ability to acquire and visualize, process, analyze, model and simulate complex data to close the data-to-knowledge gap.

B. Strategy/ies to achieve goal

1) Build comprehensive teams, engage new partners, build infrastructure.
2) Obtain funding to support activities.
3) Perform innovative research and development and transfer to constituents.
4) Educate students and communicate with the public.

C. Actions

**Build comprehensive teams, engage new partners, build infrastructure.**

1) Strategically partner and collaborate with UA faculty, industry, private sector and farmers and growers leading to high impact, problem solving and translational research and product development in use of information based technologies for ag and life sciences: bio5, COM, COS, ENGR, ALARC, SWWRC, OALS, UA High Performance Computing (HPC). FY 12-21
2) Partner with database development managers to develop information tools for life sciences. FY 13-18
3) Expand the capabilities and personnel of the Statistics Consulting Laboratory, in database management, and in decision support systems. FY 13-16
4) Expand infrastructure for sensor development and deployment. FY 14-18
5) Enhance publicity, web presence, and student recruiting. FY 12-21

**Obtain funding to support activities.**

1) Cultivate revenue generating activities (SCL and w/ USDA-ALARC) for funds to expand capabilities FY 13-16
2) Leverage diverse skills and integrated teams to aggressively seek funding for support of large information research projects; partner with iPlant, develop NSF proposals on BigData, seek new opportunities with DOE, NIH, DARPA, ARPA-E, NASA. FY 12-21
3) Seek funding for graduate students - National Needs Fellowships, NSF Fellowships, IGERT, NASA FY 13-21
4) Seek funding for unique undergraduate student programs FY 13-21

**Perform innovative research and development and transfer to constituents.**

1) Develop and utilize new methods for collection and analysis of information-rich applications in agriculture and life sciences. FY 12-21
2) Develop novel and useful sensors to monitor key biological factors important for human health, nutrition, food safety, agricultural production, and environmental protection. FY 12-21
3) Evaluate commercial or prototype sensors and devices for use in our laboratory, field, and CEA applications. FY 12-18
4) Translate research and development in sensors and systems to industry. FY 13-18
5) Utilize sensors, high throughput technologies, and information systems to connect genotype to phenotype for plant and animal agricultural production systems. FY 14-21
6) Utilize information systems, near and remote sensing, modeling, simulation, visualization, and cloud computing to improve water resources utilization in generating feedstocks for food, biofuel, and bioproducts. FY 15-19
7) Develop a sensing / biosensing network for Arizona akin to AZMET, focus on environmental exposures, health effects, and food safety. FY 17-20
**Educate** students and **communicate** with the public.

1) Develop a comprehensive educational program for undergraduate and graduate students for practical use of information and new computing tools for ag and life science. Develop B.S. program concentration. FY 12-21

2) Enhance capacity for teaching hands on activities (especially sensors) and for distance education. FY 13-21

3) Provide unbiased analysis of the cost/benefit factors of technologies, production systems and practices proposed and developed. FY 13-21

4) Provide regular communication to the public and scientific community to promote public understanding of sensing, modeling, and data-driven science. FY 12-21

5) Participate in student experiential programs like iGEM (international Genetically Engineered Machine) competition; cooperate with molecular biologists FY 13-21

**D. Inputs needed to achieve the goal** (do not limit to financial inputs)

1) Wider collaboration from diverse researchers in the strategic areas in UA, nationally and internationally.

2) Willingness and participation of industrial and grower partners with funding investments.

3) Enhanced research and teaching facilities.

4) Diversified funding and financial support for increased RA/TA’s and technical staff FTE.

5) Collaboration and support of UA OTT, Az Center for Innovation, VPR.

6) Increased collaboration with ENGR (especially ECE and SIE) and College of Public Health in education and research for biological information.

7) Increased coordination within CALS (bringing biological data collection, data management, and decision support to a unified center).

8) Partnerships with other data-intensive groups leading to financial support.

9) Business-oriented staff to manage projects, cultivate partners (especially with industry).

10) Training and assistance in improving public relations and web presence.

**E. Objective metrics that will be used to track progress towards attaining goal**

1) Total dollar values of external and internal funds obtained

2) Number of graduate students, postdocs, and technical staff hired

3) Number of partnerships established with industry and growers

4) Number of partnerships established within UA, in the national and international platform

5) Number of students (UG, G, distance) taking relevant courses

6) Number of peer reviewed journal publications on biological information and sensors based programs, citations received

7) Dollar values of expected impacts on industry.

8) Number of graduates (BS, MS, PhD) who gain jobs in this field, especially in AZ.
STRATEGIC GOAL THREE: Serve as a recognized worldwide leader in the development of innovative technologies and information systems for production of safe food, feed, and fiber.

ABE Faculty: Andrade, Cuello, Giacomelli, Kacira, Siemens, Yoon

A. Current situation and gap between current situation and desired situation

Currently, resources are strained to provide safe, secure, nutritious and plentiful food, feed and fiber supply to the world. This is particularly true in arid and semi-arid environments where resources needed for agricultural production (water, energy, infrastructure, labor) tend to be scarce. As world population increases, production systems that are more efficient, productive, environmentally sound, ensured safe, and economically viable will be increasingly important. Development and dissemination of new technologies and information systems that provide solutions to problems facing field and controlled environment agriculture (CEA) in arid and semi-arid environments is important today and critical for the future.

The ABE department has long dealt with the problems associated with high temperatures and solar radiation loads, water scarcity, low soil fertility and an increasing population. Many solutions developed in AZ include intensive crop production, specialized animal and crop breeding and germplasm evaluation programs, and an extensive dairy and meat production program, all of which are focused on climate-responsive sustainability. ABE could become the key interface between laboratories and the field/greenhouse producers. We are well positioned as a global leader in efforts to enhance agricultural production in increasingly harsh environments. Gap: CEA needs stability in funding, field use needs research and Extension support, needs climate scientists engaged with agriculture, needs public support for arid land agriculture, needs development of workforce with skills in high technology.

B. Strategy/ies to achieve goal

1) Build comprehensive teams, engage new partners, build infrastructure.
2) Obtain funding to support activities.
3) Perform innovative research and development and transfer to constituents.
4) Educate students and communicate with the public.

C. Actions

Perform innovative research and development and transfer to constituents.
1) Utilize our engineering skills to develop technological applications of basic research in plant and animal science. FY 12-21
2) Develop sensing, mechanization, and automation technologies for crop production in the field and in CEA environments. Aim is to reduce labor requirements; decrease production cost; improve food safety, traceability, and nutrition; increase yields, crop productivity, and improve resource use efficiencies with current production practices, with increasing use of marginal quality, and in response to climate change. FY 12-21
3) Develop and evaluate information-rich methods (remote and near sensing, modeling and simulation, genomic and phenotypic data) using decision-support systems to improve agricultural production practice economics and environmental impact. FY 12-21
4) Tackle the “hard problems” in use of reclaimed water for irrigation. FY 14-21

Obtain funding to support activities.
1) Seek new sources of funding for research, extension, and instruction especially to promote utilization of new technology in arid land agriculture with integrated, strategic teams. Engage USDA, NSF, NIH, EPA. FY 13-21
2) Promote a fee for service approach for instruction and extension activities. FY 13-21
3) Develop new partnerships with equipment manufacturers, sensor and database management companies, and other industries to provide equipment and finances to support research. FY 13-21
4) Seek funding for graduate students: National Needs Fellowships, NSF Fellowships, IGERT, NASA FY 14-21

Build comprehensive teams, engage new partners, build infrastructure.
1) Formalize partnerships to foster growth of arid land agriculture with the goal of solving high impact problems. Combine the efforts of multi-disciplinary researchers and extension agents working at existing centers within the college, in USDA, and with local farmers and growers. Possibly create a Center for Translational Agriculture for Arid and Semi-Arid Climates (ABE, PLS, CEAC, MAC, YAC, AREC, ARC, ALARC, Nut Sci, Food Safety Consortium, Meat Sci Lab, WEST Center, OALS); industries of cotton, leafy greens, greenhouse production, animal products, and others. FY 12-21
2) Promote and facilitate international collaboration and host visitors, especially from arid lands. FY 12-21
3) Enhance infrastructure for research and teaching. FY 12-21
4) Enhance publicity, web presence, and student recruiting. FY 12-21

Time Period (Fiscal Years)

Appendix Page | 7
5) Translate new technologies and systems developed into viable commercial products with IP protection where appropriate. FY 12-21
6) Develop engineering solutions to facilitate organic agriculture. FY 15-19

**Educate students and communicate with the public.**

1) Develop internationally recognized education programs in arid land agriculture including CEA production, sensing and automation, and irrigation using marginal water and reclaimed water. Incorporate more sensing, image processing, data management, advanced irrigation, and plant stress and disease mitigation into instructional curriculum. FY 12-21
2) Develop educational tracks which partner with other CALS programs to foster incorporation of new technology into other majors (PLS, AnSci, AREC, AgEd, NS). FY 12-21
3) Provide distance education for U.S. students and international (dual language courses). FY 12-15
4) Assist growers, farmers, and community through dynamic, timely, and unique extension programs. FY 12-21
5) Support the growth and public perception of locally grown food and community agriculture (especially of arid land food production) through our research, extension, Master Gardener programs, hosting externs, and community presentations. FY 12-21
6) Provide unbiased information to address food vs. fuel debate. Interface with legislators and funding agencies to help set federal priorities. FY 12-21

**D. Inputs needed to achieve the goal** (do not limit to financial inputs)

1) Collaboration from diverse disciplines and organizations in UA and globally.
2) Faculty-level planning and administration-coordinated efforts.
3) Resources to perform technology translation.
4) Financial support of unique facilities (CEAC, field capabilities), possibly using new funding mechanisms.
5) Increased state and federally funded research and extension activities.
6) Increased access to federal groups focused on setting national agenda for food vs. fuel priorities.
7) Increased connections to industry for career placement of graduates and development of projects.
8) Increased collaboration with international students.
9) Investment in developing specialized ABE curriculum for crop production in arid lands.
10) Increased funds for research and Extension activities.
11) Training and assistance in improving public relations and web presence.

**E. Objective metrics that will be used to track progress towards attaining goal**

1) Number of technologies (IP protected and non-protected) developed that are commercialized.
2) Number of UA and non UA faculty, growers and industry personnel participating in activities.
3) Number of acres/growers adopting new technology – Increase of productivity of labor (i.e. boxes of produce, bales of cotton, tons of grain/forage, etc) – Increase of output per unit of labor.
4) Number of graduates (BS, MS, PhD) who gain jobs in this field, especially in AZ.
5) External funds raised (sponsored research and Extension, industrial contracts, gifts).
6) Number of international visitors and collaborators.
7) Number of partnerships with foreign countries, foreign universities, and foreign growers.
STRATEGIC GOAL FOUR: The goal of the ABE water resources engineering area is to develop and provide world-class research, instruction, and Extension activities to improve economics, research utilization, and quality of life in semi-arid regions which are being impacted by changing climate and changing demographics.

ABE Faculty: Farrell-Poe, Martin, Poe, Slack, Waller, Yitayew

A. Current situation and gap between current situation and desired situation

The amount and quality of water in Arizona will play an increasing role in the state’s prosperity through activities in agriculture, manufacturing, and municipal sectors. Factors impacting our water use include climate change (in which Arizona is likely to get warmer and drier), increased urbanization, and growth in certain ag sectors (leafy greens in Yuma, biofuels). An opportunity for growth exists with under-served stakeholders in Arizona agriculture and municipal resources with engineering needs: Native American and Hispanic farmers and ranchers; urban landowners; and small commercial landscape, turfgrass, and horticultural-related businesses; with application of water reuse, reclaimed water, salinity issues, and conveyance. Gap: greater coordination on UA campus, additional financial support for research, extension, and instruction. Need greater public understanding of water issues, technology, and policy. Engineering skills are needed for many of the crucial advancements. UA’s Civil Engineering addresses large-scale water conveyance while UA’s Chemical Engineering addresses large-scale water treatment and desalination. Neither addresses ag use.

B. Strategy/ies to achieve goal

1) Build comprehensive teams, engage new partners, build infrastructure.
2) Obtain funding to support activities.
3) Perform innovative research and development and transfer to constituents.
4) Educate students and communicate with the public.

C. Actions

Build comprehensive teams, engage new partners, build infrastructure.

1) Participate in the coordination of water resource activities in CALS, and then Arizona. 
   FY 12-14
2) Form strategic partnerships with local and regional groups (USDA-ALARC, USDA-SWRC, ADEQ, US BoR (Yuma and Boulder City, NV), UA-CE, UA-CHEE, CALS-SWES, CALS-SNRE, UA Arboretum, Mexican institutions (Chapingo, ITSON), industry (CH2M Hill, Cairo Engineering, Kennedy Jenks) and state and city groups (SRP, Tucson Water) with a increased level of integrati
   on to achieve greater global impact in arid land water resources. FY 12-15
3) Increase our already strong ties to the water resources consulting industry in Arizona and the SW U.S. by hosting a semi-yearly conference and job fair. 
   FY 13-21
4) Develop a continual presence in under-served communities to facilitate utilization of technologies that efficiently use water for agricultural, residential, commercial, light industrial, municipal activities, and rural communities. 
   FY 15-21
5) Locate staff members at Water & Energy Sustainable Technology (WEST) Center being developed at Pima County’s Roger Road Water Reclamation Facility. 
   FY 13
6) Enhance publicity, web presence, and student recruiting.
   FY 12-21

Obtain funding to support activities.

1) Increase the profile and seek additional funding for activities especially related to water quality, onsite wastewater treatment, resource engineering, and urban and municipal water use to support extension and research programming. Engage USDA, EPA, ADA, DOE, NRCS, BoR, NSF, NIH. 
   FY 12-13
2) Seek funding for graduate students in water resources engineering through National Needs Fellowships, IGERT, NASA, and similar. 
   FY 12-13
3) Seek funding to support international students and scholars (USAID, Borlaug, others). 
   FY 12-15

Perform innovative research and development and transfer to constituents.

1) Utilize our engineering skills to develop technologies and systems for efficient utilization of water of varying qualities for agricultural and municipal use especially to respond to climate change. 
   FY 13-18
2) Extend our municipal water distribution modeling and smart distribution systems in partnership with the WEST Center, UA-CivEng, and Tucson Water to facilitate AZ city growth (landscape, turfgrass), participate in municipal planning, environmental issues, and systems level analyses. 
   FY 13-18
3) Utilize our irrigation and water management expertise to facilitate growth of new agricultural production in AZ including biofuel crops (sweet sorghum, algae, etc.). 
   FY 12-15
4) Assist under-served water stressed communities and farms to save water through advanced management models, improved irrigation systems, low water use activities, and better integration of reclaimed water use. 
   FY 14-18
5) Tackle the “hard problems” in use of reclaimed water for agricultural irrigation and municipal and residential irrigation; facilitate the development of BMP’s (best management practices). FY 14-21
6) Develop small & fast microbial and bio-active compound (endocrines, hormones, etc.) detection systems that can verify that water is safe for its intended use. Integrate these with information systems, database management, and cloud computing tools. FY 14-16
7) Develop geospatial and geographic information system technologies for crop production and water resources used for local and global food production management. FY 16-21

**Educate students and communicate with the public.**

1) Revise our instructional activities to provide a world-class comprehensive academic undergraduate and graduate programs in water resources engineering for semi-arid lands, with CE, CHEE, SWES. FY 12-15
2) Provide distance education for U.S. and international students (dual language courses). FY 12-15
3) Attract and retain a diverse spectrum of students. FY 12-21
4) Lead in the training of practitioners for onsite wastewater treatment systems. Leverage these activities to develop online instruction that will allow us to increase our outreach beyond classroom instruction and to clients outside AZ and outside US. FY 12-13
5) Extend current educational and extension programming to have a larger global impact, leveraging our international reputation in arid land water resources engineering and to increase public understanding of engineering methods used to sustain and efficiently utilize water resources. FY 12-21
6) Regularly host a high profile international conference on water use for arid lands (agriculture, municipal, and industrial). FY 14-20

**D. Inputs needed to achieve the goal** (do not limit to financial inputs)

1) Coordination of water activities (not necessarily by ABE, but someone needs to unify) on our campus.
2) New faculty member focused on irrigation (extension / instruction) for under-served groups including Native Americans; need to seek individual with cultural diversity.
3) Involved in the Arizona Section of the WaterReuse Association (statewide reclaimed water groups).
4) Resources for hosting a water resources engineering conference (ideally with revenue used to support future conferences).
5) Resources and space to host international visitors for extended stays.
6) Increased financial support of research and extension activities.
7) Additional staff that can be located at WEST Center and engaged in water resources engineering.
8) Increased collaboration with ENGR (especially CE and CHEE) in education and research for water resources.
9) Seed money to develop international partnerships focused on arid and semi-arid lands.
10) Training and assistance in improving public relations and web presence.

**E. Objective metrics that will be used to track progress towards attaining goal**

1) Number of individuals attending programming and changing behavior as a result of our programs.
2) Number of students (UG and G) and visitors focused on water resources engineering.
3) Number of technologies transferred to constituents and quantified water savings with utilization of technologies.
4) Amount of external funds garnered to support water resources activities.
5) Number of interactions with the private sector leading to changes in behavior and to jobs.
6) Number of graduates (BS, MS, PhD) who gain jobs in this field, especially in Arizona.
Notes:

The strength of the ABE Department’s activities is in developing and implementing technologies and systems for application with living systems. Our activities uniquely connect across areas, as demonstrated in the Venn diagram below in which our four strategic goals intersect. For example, we are developing sensors and devices to monitor safety of food that clearly connects two of our topical areas. Many of our programs unite three or four of our goals. The connection of sensors, systems (and systems approaches), and devices is present across our activities and this technology-driven approach underlies all that we do. Note that several actions in the pages above could be listed for multiple strategic goals. We have endeavored to avoid redundancy.
Agricultural and Resource Economics
AREC 2021 STRATEGIC PLAN

**PURPOSE**

- Discover new economic knowledge through applied economic research and impart that knowledge to students on-campus and CALS stakeholders throughout the world.
- Contribute to the overall productivity of CALS’ scholars and the doubling of CALS external funding through active collaboration on multidisciplinary grants.
- Educate all CALS students in understanding the complexities of commerce in a global economy.
- Ensure CALS’ top ranking by playing an integral role in applied economic endeavors regionally and internationally.

**2021 VISION**

Serve our state, nation, and world through a commitment to the land-grant heritage and tradition of discovery, education, and service. Our tripartite vision is:

- To advance applied economic knowledge through creative research and scholarship.
- To extend applied economic knowledge through innovative educational efforts on- and off-campus.
- To serve our college, university, community and state by promoting learning pertinent to the global economy.

**MISSION**

Uphold the most rigorous quality standards in pursuit of applied economic knowledge, its application, and its transmission to students, CALS stakeholders and society at large to address pressing social challenges.

**SHARED VALUES**

- Quality and Excellence
- Integrity, Trust and Respect
- Discovery, Innovation, and Creativity
- Land-Grant Ideals
- Diversity and Global Citizenship
- Stewardship and Accountability
- Freedom of Expression

**PREAMBLE**

For timely and credible economic analysis to be performed in CALS and for meaningful economic education of CALS students, applied economists must have a vibrant, cohesive, identifiable unit within CALS. No top-ranked college of agriculture in the United States maintains its rankings without agricultural economics research and education. Further, agricultural economists play an integral role in garnering multidisciplinary grants in which applied economic analysis is a necessary requirement. Agricultural and resource economists are uniquely qualified to provide essential economic education of on- and off-campus students so that they may prosper and flourish in a global economy.

The following four strategic goals identify the short- and long-run benefits to CALS of the research, teaching and extension only agricultural and resource economists can provide. In the short run, many of the innovative, exciting opportunities outlined can be realized with current faculty numbers through a reallocation of efforts between teaching and research. Greater benefits to CALS in the longer run will, however, require filling positions vacated owing to retirements and potentially from attrition as well as two new faculty lines. The two new lines will be leveraged in part by alumni and industry donations to an endowed chair as well as allocation of start-up funds from other discretionary sources like restricted UA Foundation accounts at AREC’s disposal. With two new lines filled between FY15 and FY17, all the longer run benefits in extension, teaching, and research outlined in the four strategic goals can be realized.
STRATEGIC GOAL ONE

PROVIDE AN OUTSTANDING UNDERGRADUATE EDUCATION EXPERIENCE IN AGribusiness AND ENVIRONMENTAL ECONOMICS AND MANAGEMENT THAT PREPARES STUDENTS TO EXCEL IN A GLOBAL SOCIETY

A. Current situation and gap between current and desired situation:

FY12
180 Agribusiness Economics and Management majors
30 Environmental and Water Resource Economics majors
No general education courses
One on-line and one pre-session course, with potential for growth
1/2-time advisor
1-unit "success" class for all majors
No student clubs
Modest informal internship program
Limited undergraduate alumni network

FY17-21
200 Agribusiness Economics and Management majors
100 Environmental Economics and Management majors
At least two dedicated service or general education global applied economics courses for all CALS majors
(as part of Gen Ed requirement for all students)
A minimum of four on-line and pre-session courses
Active student clubs
An actively engaged undergraduate alumni network

B. Strategies to achieve goal

1. Revise and refine undergraduate curriculum to highlight industrial organization, international trade, food security and safety, economic development, and environmental management
2. Develop and maintain new service courses (e.g. general education) that equip CALS and other university students for competition in the global economy.
3. Develop pre-session and/or online versions of the new service courses to facilitate student access (see strategy 2).
5. Maintain the current analytical, mathematical and statistical rigor in the undergraduate program. Enhance the opportunities for students with aptitudes in these areas.
6. Promote student diversity and an academic home for “2nd chance” students while raising and enforcing stricter entrance requirements for undergraduate majors to insure their academic success.
7. Develop out-of-class opportunities for students (e.g. clubs, field trips, internships, etc.), with the cooperation of a re-energized alumni network, to enhance learning, career development, job placement, and “Bear Down” alumni loyalty.

C. Actions

| Faculty cooperatively review/revise/redirect the content of the undergraduate curriculum. | FY13-15 |
Faculty explore the needs within CALS for economic education and then design and establish course opportunities for a broad number of CALS students. FY13-14

Faculty utilize CALS and University resources to develop pre-session and online courses for high-demand classes. FY13-15

Faculty work with faculty from SWES, SNRE, WRRC, Institute for the Environment, Economics, and Geography to design and establish the new Environmental Economics and Management major. FY13-15

Faculty and staff are encouraged to maintain high standards in student advising and assessment. Availability of faculty for student advising is a tradition to be maintained as a critical aspect of students' learning experience. FY13-21

The Department establishes two student clubs (e.g. National Agricultural Marketing Association (NAMA), Environmental Management Club) with the assistance of the alumni network. FY15-17

Continue collaboration in annual FFA examination and other outreach activities to foster recruitment of freshmen majors. FY13-21

### D. Inputs needed to achieve the goal

<table>
<thead>
<tr>
<th>Description</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four teaching assistants @ ($15,000 + ERE) / assistantship</td>
<td>FY 14-21</td>
</tr>
<tr>
<td>Selected faculty teaching 3 courses / year (two undergraduate courses or one course and club advisor) with appropriate department and CALS recognition</td>
<td>FY 13-21</td>
</tr>
<tr>
<td>Full-time Undergraduate Coordinator (funded by fees &amp; donations)</td>
<td>FY 13-21</td>
</tr>
<tr>
<td>Replacement of retiring faculty</td>
<td>FY 13, 15, 16</td>
</tr>
<tr>
<td>With ABOR approval, implement $200/student/semester fee.</td>
<td>FY13</td>
</tr>
<tr>
<td>Two additional faculty lines</td>
<td>FY 15-17</td>
</tr>
<tr>
<td>Operational “seed” funding to support efforts to develop and maintain our alumni network</td>
<td>FY 14-15</td>
</tr>
</tbody>
</table>

### E. Objective metrics that will be used to track progress towards obtaining goal:

1. Revised syllabi, curriculum and courses to support global economics education.
2. Increased number of teaching assistants (4).
3. 800-1,000 additional students in AREC classes per year.
4. Generate sufficient funds from online/summer school offerings to support three additional teaching assistants.
5. 200 Agribusiness Economics and Management majors.
6. 100 Environmental Economics and Management majors.
7. 50-80 students providing leadership and regularly participating in club activities.
8. Increased number of faculty (2)
9. Increased alumni participation in undergraduate program (visits, field trips, internships, donations, public-private partnerships, etc.)
STRATEGIC GOAL TWO:

PROVIDE A PREMIER GRADUATE EDUCATION IN AGRICULTURAL AND RESOURCE ECONOMICS AND ACHIEVE A LEADING POSITION IN TRAINING RISK MANAGEMENT PROFESSIONALS

A. Current situation and gap between current and desired situation:

FY 12
Current top-10 ranking of AREC M.S. program.
No attrition and on-time graduation rates.
Diverse graduate student composition (e.g. 4 National Needs Scholars) of 30 students
Three Fulbrights and one Muskie Scholar in recent years.
100% placement with terminal degree recipients in private sector (e.g. PricewaterhouseCoopers, American Express, KPMG, Discover, JPMorgan/Chase, Citibank) and public sector (e.g. Economic Research Service, Federal Reserve, FAO, Department of Interior, Bureau of Reclamation).
Near 100% placement for non-terminal recipients in premier Ph.D. programs (e.g. Berkeley, Cornell, Oxford).
Maintained active research and excellent teaching in Applied Econometrics, Economic Development, and Environmental and Resource Economics
Foregoing achieved despite loss of 3 faculty and no state funding for RA/TA's.

FY 15-21
Further improve ranking of M.S. program.
Capitalize on the renewed market demand for risk analysis and risk management.
Buttress and generate new funding of RA/TA's to continue to recruit very brightest students.
Offer new specialized degree in Applied Econometrics and Risk Management with students paying full cost.
Maintain position as the premier center for education and training in Agricultural and Resource Economics, and Risk Management.

B. Strategies to achieve goals:

1. Continuous systematic review and refining of M.S. curriculum
2. Assure that graduate students receive superior opportunities and environment to learn and be mentored
3. Provide graduate students with a strong and nationally recognized core curriculum in quantitative methods and field courses which correspond to industry/Ph.D. demand and faculty expertise
4. Continuously recruit high quality graduate students who can be trained in teaching and research by gainfully employing them as (a) research assistants supported on grants and (b) teaching assistants supported on summer school/Outreach College proceeds for undergraduate courses
5. Offer a new MS degree in Applied Econometrics and Quantitative Risk Management for full paying students.

C. Actions:

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assure graduate students acquire the tools of economic analysis relevant to performing well in academic and non-academic careers as applied economists.</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Review and refine M.S. curriculum.</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Solicit and obtain new round of National Needs Fellowships from USDA.</td>
<td>FY13-14</td>
</tr>
<tr>
<td>Solicit NSF Master's program support.</td>
<td></td>
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<tr>
<td>Build upon existing public-private partnerships and seek new partnerships and internships.</td>
<td>FY 12-21</td>
</tr>
<tr>
<td>Designate a Career Placement Director (for recruitment and placement)</td>
<td>FY 15-21</td>
</tr>
<tr>
<td>Establish and pursue goal of $1.5M endowment &amp; $50k in restricted UA Foundation</td>
<td>FY 12-21</td>
</tr>
<tr>
<td>Initial offering of self-financed, 3-semester (16 month) M.S. degree in Applied Econometrics and Risk Management.</td>
<td>FY16</td>
</tr>
<tr>
<td>Increase numbers in self-financed M.S. program to 20 students per cohort.</td>
<td>FY 17-21</td>
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</tbody>
</table>
D. Inputs needed to achieve the goal: 

<table>
<thead>
<tr>
<th>Description</th>
<th>Time Period</th>
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</thead>
<tbody>
<tr>
<td>• Maintain graduate-level expertise in three strategic areas: Applied</td>
<td>FY15-21</td>
</tr>
<tr>
<td>Econometrics; Economic Development; and Environmental and Resource</td>
<td></td>
</tr>
<tr>
<td>• Timely approval of proposal to offer new MS degree in Applied Econometrics and Risk Management.</td>
<td>FY13-14</td>
</tr>
<tr>
<td>• Dedicated faculty and CALS Development effort toward $1.5M &amp; $50k goals.</td>
<td>FY13-21</td>
</tr>
<tr>
<td>• Replacement of retiring faculty (same lines as in Goal 1)</td>
<td>FY 13,15,16</td>
</tr>
<tr>
<td>• Two additional faculty lines (same lines as in Goal 1)</td>
<td>FY 15-17</td>
</tr>
<tr>
<td>• Advertising &amp; marketing of full-paying new degree program on website &amp; elsewhere ($20k annually from restricted UA Foundation accounts, summer school proceeds, etc.)</td>
<td>FY 15-21</td>
</tr>
<tr>
<td>• CALS’s continued recognition of AREC graduate programs as one of the pillars of its strength and national reputation.</td>
<td>FY15-21</td>
</tr>
</tbody>
</table>

E. Objective Metrics that will be used to track progress towards attaining goal:

1. Number of MS degree (Agricultural and Resource Economics) awarded annually
2. Number of MS degree (Applied Econometrics and Risk Management) awarded annually
3. Number of publications coauthored by faculty with current and recent (< 5 years) graduate students
4. Number & amount of external fellowships and scholarships awarded annually
5. Number of awards garnered by graduate students annually
6. Placement records of initial post-graduation job of AREC M.S. students (job title, company, salary)
STRATEGIC GOAL THREE:

ENHANCE REGIONAL RECOGNITION AS THE “GO TO” SOURCE OF RESEARCH-BASED, UNBIASED EXTENSION AND OUTREACH PROGRAMS FOR ADDRESSING SUSTAINABLE ECONOMIC DEVELOPMENT IN THE SOUTHWEST

A. Current situation and gap between current and desired situation:

FY 12-13: Demand for extension faculty’s participation in economic analyses and program development by Arizona agricultural and natural resource management stakeholders and colleagues in other units is high relative to the 1.95 extension FTE available.

Three extension specialists fully fund their extension program travel, operations, software and database acquisitions through extramural grants, contracts plus other external funds. These funds also provide partial support for AREC extension staff and tribal extension programs. Among AREC extension grants and contracts, ten have Co-PIs with six other units in CALS.

FY 14-15: Enhance capacity of tribal and county agents to respond to stakeholder economic information requests in cooperation with campus-based extension faculty.

FY 14-17: Enhance AREC’s capacity to conduct economic impact analyses by recruiting AREC graduate students that desire to work in this area. These students would be directed to conduct economic impact analyses of diverse regional economic development projects, private sector investments, and CALS programs with an emphasis of measuring benefits to local Arizona economies (personal income, jobs created, return on investment, etc.).

FY 17-21: Have an AREC Extension Assistant that can independently conduct economic impact analyses and communicate these results to lay audiences.

B. Strategies to achieve goal

1. Provide trainings and support materials on economic issues to county and tribal agents.
2. Develop and improve analytical tools, business plans, and marketing plans that increase efficiency and profitability of rural and tribal economic development ventures.
3. Develop in-house capacity for location, sector and technology-specific input-output modeling and energy return-on-investment modeling; provide industry-supported analyses and reports on economic development projects.
4. Continue and expand collaboration with other units in CALS and the UA on multi-disciplinary integrated research and extension grant projects.
5. Support AREC graduate research assistants via extramural grants for integrated research and extension projects; supervise thesis research related to Arizona extension needs.
6. Through extramural funds, hire one of the productive graduate students as an Extension Assistant to address economic impact analyses.

C. Actions

- Expand collaboration with extension agents and specialists, other UA units and local, state and federal agencies in support of integrated research and extension programs in the following areas:
  i. Renewable energy (solar, wind, bio-energy crops, wind, and methane digesters in livestock production),
  ii. Local food systems (technical assistance for direct farm marketing and agritourism ventures),
  iii. Land use management (assist rural communities in assessing implications of changes in land use policies and siting of new industries locally),
  iv. Water (economic assessments of drought impacts, water transfers, and

Time Period: FY 12-21
adoption of improved irrigation systems; assessments of water requirements for energy and other new commercial projects),
v. Biotechnology (maintain sustainability through contributions to ongoing insect-resistance and herbicide-resistance management programs in the state), and
vi. Commodity Outlook (continue providing updated situation and outlook information on livestock and grain commodities to Arizona producers and agribusinesses).

- In collaboration with other CALS and UA units, submit extramural grant proposals to support program areas listed above. FY 12-21
- Develop and strengthen AREC’s graduate student and extension faculty capacity to conduct specific economic impact analyses using proprietary software and data for Arizona including input-output models (using IMPLAN software and data) and energy investment modeling (using HOMER software). FY 12-21
- Develop an online Arizona Review and email list that is more cost effective than the traditional print and mail version. FY 12-21

D. Inputs needed to achieve the goal

<table>
<thead>
<tr>
<th>Inputs needed to achieve the goal</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current 1.95 extension FTEs.</td>
<td>FY 12-21</td>
</tr>
<tr>
<td>Participation of tribal and county agents, and extension specialists on collaborative projects.</td>
<td>FY 12-21</td>
</tr>
<tr>
<td>Funding from industry sources to support commissioned analyses and reports.</td>
<td>FY 12-21</td>
</tr>
<tr>
<td>Proprietary data and software for specialized economic analyses.</td>
<td>FY 15 -21</td>
</tr>
<tr>
<td>Graduate students (2-3 per year).</td>
<td>FY 12-21</td>
</tr>
</tbody>
</table>

E. Objective metrics that will be used to track progress towards attaining goal

1. Number and amount of industry, tribal, and institutional donations made to AREC’s extension pathway foundation account.
2. Number and amount of extramural grants and contracts received.
3. Number of graduate students supported and AREC MS theses completed that involve integrated research and extension projects.
4. Number of economic impact studies conducted.
5. Number of economic presentations and publications to limited-resource farmers and ranchers.
6. Number of economic presentations by extension faculty-mentored tribal agents.
7. Number of participants in local food systems training.
8. Number of participants in renewable energy trainings.
9. Adoption of new energy systems.
10. Number of business plans created and implemented by limited resource farmers and ranchers.
11. Extension FTE hours supported by extramural grants and contracts.
STRATEGIC GOAL FOUR

PROVIDE NATIONALLY AND INTERNATIONALLY RECOGNIZED RESEARCH IN SUPPORT OF MULTIDISCIPLINARY GRANTS, EXTENSION, AND ON-CAMPUS TEACHING.

A. Current situation and gap between current situation and desired situation:

FY12: Competitive grants & contracts generated by about half the faculty.
Department ranking in agricultural & resource economic research dropped several places from #8 in 2005. Current areas of research strength include sustainable water management in arid regions, regional economic adaption to drought and climate change, and applied economic analysis.

FY17: Enhance grantsmanship participation rate to include more than half the faculty.
Target grant and contracts to increase by 40% over the 2012 level.
Improve department ranking in research.

FY21: Competitive grants & contracts generated by a majority of faculty doubling the 2012 total.
Restore departmental research ranking to at least #8.

B. Strategies to achieve goal:

1. Communicate that the value of applied economic research is measured in more than just indirect cost dollars generated.
2. Develop a departmental and college culture in which applied economic research is valued and respected.
3. Communicate the importance of economic research in teaching to undergraduate and graduate students, university colleagues, and off-campus stakeholders.
4. Encourage and foster enhanced research productivity in all its manifestations.
5. Augment collaboration and partnerships with researchers within the college and throughout the university.
6. Foster stimulating intellectual climate in the department/unit in order to hire and retain best faculty.

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide timely postings of research contributions and findings on unit and CALS websites.</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Give “visiting” seminars in other CALS units highlighting relevance of applied economic research.</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Semi-annual advisory council meetings &amp; other professional forums communicating departmental research value added to society.</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Regular brown bag seminars by faculty and graduate students</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Establish &amp; maintain regular multidisciplinary-focused seminar series</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Regular seminar series with visiting scholars engaged in collaborative research</td>
<td>FY12-21</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve goal:

<table>
<thead>
<tr>
<th>Inputs needed to achieve goal</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50k for website activity (10 years @ $5k/year from grants, contracts &amp; donations)</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Involvement of Center for Sustainable Economic Development (see Goal 3)</td>
<td>FY12-21</td>
</tr>
<tr>
<td>$25k for advisory council/professional events (5 @ $5k/event)</td>
<td>FY13,15,16</td>
</tr>
<tr>
<td>Replace 3 retiring full professors with assistant professors, sharing any difference in salary between CALS and unit (same as in Goals 1 – 3)</td>
<td>FY 13,15,16</td>
</tr>
<tr>
<td>2 additional assistant/associate professors with startup of $40k / line; alumni &amp; industry donations will cover startup (same lines as in Goals 1 – 3)</td>
<td>FY 15 - 17</td>
</tr>
</tbody>
</table>

E. Objective metrics that will be used to track progress towards attaining goal

1. Number of grant proposals submitted & success rate
2. Dollar amount of grant proposals funded
3. Number of manuscripts submitted and ultimately published
4. Impact factors of published research
5. Amount of monetary and non-monetary research support from alumni
6. Amount of monetary and non-monetary research support from industry/clientele groups
7. Number of undergraduate students participating in research projects
8. Number of research website hits
9. Number of alumni research events
10. Number of industry/clientele research events
Agricultural Education
Purpose:

The Department of Agricultural Education contributes to the College’s unique functional role as a leader in the University’s land-grant mission by providing an array of programs in formal undergraduate and graduate instruction, research, and service to enable the people of Arizona, the nation, and beyond to improve the quality of their lives.

The strength of the Department is firmly grounded in its nationally and internationally recognized faculty, who in a positive and proactive manner, are committed to educational excellence and to addressing the challenges and opportunities presented by the current climate of change within the College, the University, the nation, and the world.

2021 Vision:

We engage the leadership of the future in Agricultural Education by providing a better quality of life through a knowledge base in agricultural technology management, formal and non-formal education, and leadership for our students, the people of Arizona, and society.

We accomplish this by:

- Providing undergraduate and graduate curricula in agricultural teacher preparation, interdisciplinary agricultural technology management, leadership and communication, and agricultural systems management.
- Coordinating a variety of experiential learning opportunities through student organizations, internships, and domestic and international experiences.
- Providing professional improvement opportunities and instructional support for non-formal educators, and for faculty and administrators in the K through post-secondary education continuum.
- Providing leadership and expertise in shaping and advancing career and technical education.
- Partnering with internal and external stakeholders.
- Seeking extramural funds to deliver needs-based program in agricultural education, and career and technical education, in general.
- Conducting and disseminating research on teaching, learning, and program development and evaluation within agricultural educational systems.

Mission:

The primary mission of the Department is serving a diverse population through teaching, application, integration, and discovery in agriculture, education, and applied science and technology leading to successful careers in agricultural education and related businesses and industries.

Shared Values: We are student centered and value

- Quality teaching and student advising
- High standards of professionalism, performance, and practice
- A positive learning environment for students, staff, and faculty
- Continuous personal development for faculty and staff
- Teamwork & Open communication
- Mutual respect
Departmental Goals:

1. Prepare marketable individuals for careers in agricultural technology, leadership, communication, and education related fields and occupations.
2. Establish and develop a CALS Center for Excellence in Teaching.
3. Prepare and develop Career and Technical Education (CTE) teachers.
4. Prepare and develop adult and youth educators for occupations within agriculture.
5. Establish an Institute for Agricultural Literacy.
   - Extending Arizona Project WET
6. Develop and implement a Ph.D. degree program in Agricultural Education.
7. Contribute to the knowledge base in the agricultural education profession.
STRATEGIC GOAL 1:
PREPARE MARKETABLE INDIVIDUALS FOR CAREERS IN AGRICULTURAL TECHNOLOGY, LEADERSHIP, COMMUNICATION, AND EDUCATION RELATED FIELDS AND OCCUPATIONS.

A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural education teacher shortage</td>
<td>• An increased number of students in each option area</td>
</tr>
<tr>
<td>The Department has the only preparation program in the state.</td>
<td>• Concentrated efforts on recruitment and retention</td>
</tr>
<tr>
<td>Alternative certification options are failing. They are a temporary solution.</td>
<td>• Increased financial support for students in all option areas</td>
</tr>
<tr>
<td>Aging agricultural leadership</td>
<td>• Expanded experiential opportunities</td>
</tr>
<tr>
<td>Non-traditional student backgrounds</td>
<td>• Enhanced facility resources</td>
</tr>
<tr>
<td>Aging facilities</td>
<td>• Increased graduation rate</td>
</tr>
<tr>
<td>Unrealized career opportunity</td>
<td></td>
</tr>
<tr>
<td>Low student numbers</td>
<td></td>
</tr>
<tr>
<td>High tuition cost</td>
<td></td>
</tr>
<tr>
<td>Limited scholarship opportunity</td>
<td></td>
</tr>
<tr>
<td>Curriculum (content) changes</td>
<td></td>
</tr>
<tr>
<td>Four emphasis areas within the Bachelor of Science degree:</td>
<td></td>
</tr>
<tr>
<td>o Agricultural Education (AED)</td>
<td></td>
</tr>
<tr>
<td>o Agricultural Leadership and Communication (AGL&amp;C)</td>
<td></td>
</tr>
<tr>
<td>o Agricultural Systems Management (ASM; Yuma-based)</td>
<td></td>
</tr>
<tr>
<td>o Agricultural Technology Management (AGTM)</td>
<td></td>
</tr>
<tr>
<td>Gap</td>
<td></td>
</tr>
</tbody>
</table>

B. Strategy/ies to achieve goal (list if more than 1):

- Establish a recruitment and retention plan to increase student numbers and to retain students in each degree option.

C. Actions

<table>
<thead>
<tr>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 12</td>
</tr>
<tr>
<td>FY 12</td>
</tr>
<tr>
<td>FY 13</td>
</tr>
</tbody>
</table>

- Prepare and develop recruitment/retention plan
- Engage industry, alumni, and education partners
- Partner with UA and CALS units for curriculum needs
- Hire a recruitment/retention/development officer

D. Inputs needed to achieve the goal (do not limit to financial inputs)

- One recruitment/retention/development officer
- Two graduate teaching assistants

Appendix Page | 25
• Stakeholder and advisory group input and collaboration

E. Objective Metrics that will be used to track progress towards attaining goal.
• To increase total undergraduate enrollment in Agricultural Education by 50% in five years; 75% in 10 years; 100% in 15 years.
• To increase total graduate enrollment in Agricultural Education by 30% in five years; 50% in 10 years; 75% in 15 years.
• To increase the retention rate of undergraduate and graduate students by 50% in five years; 75% in 10 years.

Notes (if any)
Use 2012 enrollment and retention data as the benchmark metric.
STRATEGIC GOAL II:
ESTABLISH AND DEVELOP THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES (CALS) CENTER FOR EXCELLENCE IN TEACHING

A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Office of Academic Programs periodically has workshops</td>
<td>• The Department:</td>
</tr>
<tr>
<td>• Needs of CALS faculty unknown</td>
<td>• Provides the teaching and learning resources for CALS faculty</td>
</tr>
<tr>
<td>• Support of the Bart Cardon Academy for Teaching Excellence Fellows</td>
<td>• Provides the contextual background</td>
</tr>
<tr>
<td>• Not enough focus on this</td>
<td>• Provides applied knowledge</td>
</tr>
<tr>
<td></td>
<td>• Offers philosophical/theoretical/conceptual knowledge</td>
</tr>
<tr>
<td></td>
<td>• Gives assessment/evaluation</td>
</tr>
</tbody>
</table>

B. Strategy/ies to achieve goal (list if more than 1):

➢ Market faculty expertise in teaching, learning, assessment, and technology

C. Actions

| Establish a needs assessment report                                  |
| Review peer institutions that have centers for teaching and learning |
| Create a strategic plan/logic model                                 |
| Seek extramural and/or philanthropist funding                       |
| Communicate and market with stakeholder groups                      |
| Implement teaching professional development activities              |
| Provide support for designing and implementing online education     |
| Evaluate and assess impact                                          |

D. Inputs needed to achieve the goal (do not limit to financial inputs)

• One FTE
• One graduate teaching assistant
• One support staff
• Advisory group support
• Facilities (based on the Brenton Center at Iowa State University, http://www.brenton.iastate.edu/facilities.html)
  o The Brenton Center is a high-technology instructional center that extends the educational offerings of Iowa State University beyond ISU’s physical campus. The state-of-the-art educational facilities can serve as on-campus location for seminars, conferences, the origination site for distance education offerings, or face-to-face classes.
  o A conference room equipped for IP video conferences, telephone audio conferences, and Internet web conferences using Adobe Connect. This would include one large screen, Elmo, computer, instructor camera, student cameras, microphones, and wireless Internet. It would be suitable for graduate student final defenses,
presentations, meetings, or classes. The room would be configured with movable tables and seats 35, and a small attached kitchenette.

- A classroom equipped with two large screens, Elmo, computer, instructor camera, student cameras, microphones, and wireless Internet. It would be equipped with movable tables and seats 35. This room would have multi-point IP video conferencing and Adobe Connect conferencing capabilities.
- Two video capture classrooms that allow for face-to-face class or studio capture using the Accordent Capture Station to capture the instructor and computer desktop simultaneously or Camtasia Relay to capture audio and computer desktop. Course delivery would be streaming video/audio via BlackBoard, iTunesU, or CD/DVD.
- A classroom equipped with four large screens, Elmo, computer, instructor camera, student cameras, microphones, and wireless Internet. This room would have multi-point IP video conferencing and Adobe Connect capabilities. It would have fixed tables that seat 56.

E. Objective Metrics that will be used to track progress towards attaining goal.

- Obtain a record of faculty teaching, student learning, assessment, and technology use within 3 years.
- Offer 2-3 needs-based professional development workshops for CALS faculty annually; increase professional development offerings by 50% within 10 years.
- Increase faculty participation in each workshop by 50% within 5 years, 75% within 10 years; and 10% within 15 years.
- Obtain impact data from faculty participants as measured by teaching and course evaluations.

Notes (if any)
Use FY 2012 professional development activities within CALS as a benchmark metric.
STRATEGIC GOAL III:
PREPARE AND DEVELOP CAREER TECHNICAL EDUCATION (CTE) TEACHERS

A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Prepare agricultural education teachers</td>
<td>• Produce an abundant supply of highly qualified CTE teachers</td>
</tr>
<tr>
<td>• CTE programs growing in AZ</td>
<td>• Become the premier provider of certifiable CTE teachers for Arizona and neighboring states</td>
</tr>
<tr>
<td>• CTE teacher prep programs have dissolved</td>
<td></td>
</tr>
<tr>
<td>• ADE alternative certified short-term solution to the growing need for CTE teachers</td>
<td></td>
</tr>
<tr>
<td>• Loss of CTE philosophy for program delivery from alternatively certified CTE teachers</td>
<td></td>
</tr>
</tbody>
</table>

B. Strategy/ies to achieve goal (list if more than 1):
1. Utilize the Career and Technical Education (CTE) Administrator Graduate Certificate. The purpose of the CTE Administrator Graduate Certificate is to provide individuals who are employed as CTE Administrators in Arizona schools, or individuals who have plans to be employed as a CTE Administrator, with the opportunity to enhance their knowledge of CTE principles and philosophies, educational leadership, as well as Arizona school finance. Students who enroll in the certificate program will take coursework that can lead to additional administrative certification, particularly the principal and superintendent certification through the College of Education.
2. Establish the CTE emphasis area in the Master of Agricultural Education as a pathway to CTE certification.
3. Utilize the Accelerated Master’s Program (AMP) for CTE Teacher Certification.
5. Collaborate with the Arizona Department of Education, Division of Career and Technical Education in developing and marketing the CTE teacher preparation program.

C. Actions

- Work with the Arizona Department of Education (ADE) teacher certification
- Work with Local Education Agencies (LEAs) and CTE Directors
- Prepare CTE professional knowledge for online delivery
- Increase marketing and awareness of CTE pathways
- Partnership with LEA/ADE/JTED(Joint Technical Education Districts)/WEDO(Workforce Education Development Office)/Alumni
- Promote and enhance the Accelerated Master’s Program (AMP) for CTE Teacher Certification with other units
- Engage WEDO for workshop delivery in teacher certification requirements
- Provide professional growth opportunities for CTE teachers (WEDO)

<table>
<thead>
<tr>
<th>FY</th>
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</thead>
<tbody>
<tr>
<td>FY 12</td>
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<td>FY 12</td>
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<td></td>
</tr>
<tr>
<td>FY 12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • The Career and Technical Education option for administrators is in the process of being approved
   • Collaboration with other CALS units, LEA, ADE, JTED, Alumni, and WEDO
   • Advisory group support

E. Objective Metrics that will be used to track progress towards attaining goal.
   • Increase the number of students who enroll/graduate in the CTE graduate program by 30% in five years; 50% in 10 years; 75% in 15 years.
   • Increase the number of undergraduate students who seek a non-agriculture CTE teacher certification by 20% in five years, 50% in 10 years, and 100% in 15 years
   • Graduate 3-5 non-agriculture CTE teachers within 7 years; 7-10 within 10 years; 14-16 within 15 years

Notes (if any)
   Use 2012 enrollment data as the benchmark metric.
STRATEGIC GOAL IV: PREPARE AND DEVELOP ADULT AND YOUTH EDUCATORS FOR OCCUPATIONS WITHIN AGRICULTURE

A. **Current situation** (i.e. problem to overcome/opportunity to capitalize on) and **gap between current situation and desired situation:**

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Prepare and develop needs for Extension educators and specialists</td>
<td></td>
</tr>
<tr>
<td>- Shortage of opportunities to become a qualified Extension educator and 4H youth development specialists</td>
<td></td>
</tr>
<tr>
<td>- Opportunities for preparation and development training for professionals outside of Agriculture (Farm Bureau, Ag Commodity Groups, Scouts, other non-profit organizations)</td>
<td></td>
</tr>
<tr>
<td>Gap</td>
<td></td>
</tr>
<tr>
<td>- Choice of degree/continuing education program for Extension education such as a Masters or other adult and youth education venues</td>
<td></td>
</tr>
<tr>
<td>- Recognized as a premier provider through Leadership and Communication and Masters programs</td>
<td></td>
</tr>
</tbody>
</table>

B. **Strategy/ies to achieve goal (list if more than 1):**

- Promote and enhance the curriculum and experiences associated with non-formal instruction of agriculture and leadership topics

C. **Actions**

<table>
<thead>
<tr>
<th>Action</th>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market the Leadership and Communication option within the AGTE major</td>
<td>FY 12</td>
</tr>
<tr>
<td>Market the Master of Science in professional agriculture</td>
<td>FY 12</td>
</tr>
<tr>
<td>Delivery of the Leadership and Communication option via Distance Education</td>
<td>FY 13</td>
</tr>
<tr>
<td>Partner with the regional campuses and key stakeholder groups (Farm Bureau, Community Groups, etc.) to enhance the student learning experiences</td>
<td>FY 13</td>
</tr>
</tbody>
</table>

D. **Inputs needed to achieve the goal (do not limit to financial inputs)**

- One FTE person to provide instruction in, advise students, and promote the Leadership and Communication
- Advisory group support

E. **Objective Metrics that will be used to track progress towards attaining goal.**

Increase the number of students who are able market-ready with expertise in non-formal education by 10 within five years; 20 within 10 years; and 30 within 15 years

Notes (if any)
STRATEGIC GOAL Va: ESTABLISH AN INSTITUTE FOR AGRICULTURAL LITERACY

A. **Current situation** (i.e. problem to overcome/opportunity to capitalize on) and **gap between current situation and desired situation:**

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Public, including University students, knowledge</td>
<td>• An agriculturally literate</td>
</tr>
<tr>
<td>awareness base is limited</td>
<td>society</td>
</tr>
<tr>
<td>• Increasing interest in growing food and organics</td>
<td>• Systematic delivery systems</td>
</tr>
<tr>
<td>• Water conservation issues</td>
<td></td>
</tr>
<tr>
<td>• Lack of systematic effort to broaden agriculture awareness</td>
<td></td>
</tr>
</tbody>
</table>

**Gap**

B. **Strategy/ies to achieve goal (list if more than 1):**

1. Develop and grow college course work in agriculture knowledge and issues (Tier II)
2. Maintain quality of offerings and expand opportunities for water education
3. Create a public awareness program via the AGTM option within the AGTE major

C. **Actions**

<table>
<thead>
<tr>
<th>Actions</th>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Partner with Agriculture groups, such as Farm Bureau and Agriculture In The Classroom (AITC) and alumni to deliver agriculture literacy programs</td>
<td>FY13</td>
</tr>
<tr>
<td>• Align with Cooperative Extension in agriculture literacy efforts</td>
<td>FY13</td>
</tr>
<tr>
<td>• Maintain a high priority in water education proograming in rural and urban settings</td>
<td>FY13</td>
</tr>
<tr>
<td>• Help agriculture education teachers to better communicate the broad career opportunities in agriculture</td>
<td>FY13</td>
</tr>
<tr>
<td>• Align with WR C1006 to conduct research on post-secondary agriculture literacy</td>
<td>FY13</td>
</tr>
<tr>
<td>• Seek extramural and/or philanthropist funding</td>
<td>FY13</td>
</tr>
</tbody>
</table>

D. **Inputs needed to achieve the goal (do not limit to financial inputs)**

- Two graduate teaching assistant positions
- Financial endowment to support activities and operations
- CALS Foundation assistance
- Advisory group support

E. **Objective Metrics that will be used to track progress towards attaining goal.**

- Establish a $500k financial endowment to support Institute activities and operations within seven years.
- Deliver annually five major formal and non-formal instructional activities (course offerings, workshops, seminars, etc) that improve the agriculture literacy of students, and the general public within Arizona within five years and deliver annually 10 major instructional activities within 10 years.
- Deliver water education programs by engaging three major cities, four rural communities, and five school districts within the next five years.
STRATEGIC GOAL Vb: 
EXTEND ARIZONA PROJECT WET

A. **Current situation** (i.e. problem to overcome/opportunity to capitalize on) and **gap between current situation and desired situation**:

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher and student performance is currently measured by the outdated, fact-oriented <em>Arizona's Instrument to Measure Standards (AIMS)</em> that was developed to assess standards that are no longer in practice. AIMS is still used to designate a school’s quality and is often used as proof of teacher quality and advancement.</td>
<td>- Develop and deliver programs and PBL modules that integrate STEM subjects seamlessly and offer real-world experiences that enable students to think through complex issues.</td>
</tr>
<tr>
<td>The Common Core Standards are currently in place, but appropriate assessment based on the new standards has not been funded nor developed.</td>
<td>- Deliver effective teacher professional development that models best instructional practices that meet 21st Century learning goals and feature embedded assessment opportunities to gage learning.</td>
</tr>
<tr>
<td>The Common Core Standards for English Language arts state that students who are college and career ready in reading, writing, speaking, listening and language: demonstrate independence, build strong content knowledge, respond to varying demands, comprehend as well as critique, value evidence, use technology and digital media strategically and capably, and come to understand other perspectives and cultures.</td>
<td>- Offer relevant field studies that are targeted and part of the exploration and discovery as well as opportunities for students to communicate learning and take action in their lives and communities.</td>
</tr>
<tr>
<td>The Common Core Standards for Mathematics and Draft Next Generation Science Standards state very similar overall benchmarks.</td>
<td></td>
</tr>
<tr>
<td>New forms of teacher development, real world experiences for students, informal education that is linked to school-based education and community and business involvement are all needed to produce college and career ready graduates who can think critically and creatively about interconnected issues.</td>
<td></td>
</tr>
</tbody>
</table>

B. **Strategy/ies to achieve goal** (list if more than 1):

Improve creative and critical thinking, problem solving and 21st Century collaboration and communication skills by modeling the facilitation of Project Based Learning (PBL) in ongoing teacher professional development; offering real-world, STEM integrated learning experiences for students; and training community and business members to facilitate student learning.

<table>
<thead>
<tr>
<th>C. Actions</th>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Design professional development to focus on PBL instructional strategies that have students thinking critically and creatively about relevant natural and human resource issues. Train team.</td>
<td>FY 12-13</td>
</tr>
<tr>
<td>- Correlate all materials to the new Common Core and Next Generation Science</td>
<td>FY 13-14</td>
</tr>
</tbody>
</table>
Standards
- Modify project based learning modules based on realized success and lessons learned and build new PBL modules to maintain student interest in interrelated natural and human resources issues
- Increase emphasis on STEM subjects and science and engineering practice
- Develop online learning platform to employ technology more tangibly in to PBL modules
- Build capacity with teachers at the schools where the PBL has taken hold
- Interest new businesses and community members; train adults to facilitate student learning
- Conduct formative and summative assessment of all program components
- Save millions of gallons of water through applied student learning that produces action
- Maintain statewide infrastructure with personnel, resources and equipment in four counties

D. Inputs needed to achieve the goal (do not limit to financial inputs)
(Fundraising will be ongoing)
- One Faculty Director ($100,000) annually
- One Program Coordinator ($60,000) and two half time Community Coordinators ($24,000) for every 20 teachers and 2000 students
- Twenty Teachers: $12,000
- Field Experiences for 2000 students: $20,000
- Student Symposia for 1000 students: $20,000
- Resources, Books and Equipment: 60,000
- **Total per year to double capacity: $196,000**
- Online learning platform development: $100,000

E. Objective Metrics that will be used to track progress towards attaining goal.
- Teachers pre- post- surveys and self-report on ability to facilitate PBL and teach natural resources content will yield positive delta scores
- Pre- post- student surveys on confidence using science and engineering practices and thinking critically will yield positive delta scores
- Rubrics built by UA team and teachers together to assess progress within three years and use annually thereafter.
- Develop observation forms to assess students’ synthesis of understanding and communication skills and forms of evidence (e.g. notebooks) of student achievement within two years and use annually thereafter.

Notes (if any)
STRATEGIC GOAL VI: DEVELOP AND IMPLEMENT A PH.D. DEGREE PROGRAM IN AGRICULTURAL EDUCATION BY 2021

A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona does not have an Agricultural Education Ph.D. program.</td>
<td>The Department would offer the only Agricultural Education Ph.D. program in Arizona.</td>
</tr>
</tbody>
</table>

B. Strategy/ies to achieve goal (list if more than 1):
Establish a Ph.D. degree program

C. Actions
- Conduct a needs assessment/feasibility report
- Review peer institutions that have Ph.D. programs
- Create a strategic plan/logic model
- Implement teaching and learning activities for a Ph.D. program

D. Inputs needed to achieve the goal (do not limit to financial inputs)
- One FTE
- Two graduate teaching assistants
- One support staff
- Scholarships for Ph.D. students
- Advisory group support

E. Objective Metrics that will be used to track progress towards attaining goal.
- Complete a feasibility report for verifying the demand for a Ph.D. degree in Ag Ed in the western coastal area within three years.
- Develop and submit a degree proposal for the Ph.D. degree in Agricultural Education within the next five years.
- Implement the proposal and begin recruiting 2-3 students annually two years after the program approval.

Notes (if any)
STRATEGIC GOAL VII:  
CONTRIBUTE TO THE KNOWLEDGE BASE IN THE AGRICULTURAL EDUCATION PROFESSION

A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:

<table>
<thead>
<tr>
<th>Current</th>
<th>Desired</th>
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<tbody>
<tr>
<td>• Not enough financial support for social science research</td>
<td>• The Department will be known for research in the social sciences</td>
</tr>
<tr>
<td>• Not recognized for social science research</td>
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B. Strategy/ies to achieve goal (list if more than 1):
- Establish an extensive research program
- Align departmental research initiatives with professional association research priorities

C. Actions
- Seek funding for research
- Increase and publish research findings in journals, posters, and papers
- Promote within CALS the published research findings

<table>
<thead>
<tr>
<th>FY</th>
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<td>FY 12</td>
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<td>FY 14</td>
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D. Inputs needed to achieve the goal (do not limit to financial inputs)
- Four graduate research assistants
- Grant assistant personnel
- CALS Foundation assistance

E. Objective Metrics that will be used to track progress towards attaining goal.
- Increase the level of research activity within the department establishing 2-3 research multidisciplinary research teams within the University and nationally within five years.
- Increase the number of referred publications and presentations by 10% within five years and 30% within 10 years.
- Seek extramural funding ($250k) via federal and state grants, as well as private business sponsorships to sustain 3-5 year research projects.

Notes (if any)
Animal and Comparative Biomedical Sciences
Overview: The School of Animal and Comparative Biomedical Sciences (CABS) brings together animal scientists, veterinarians, microbiologists and others to offer the strongest possible programs in research, education and outreach. This school was formed in order to offer more integrated research and educational opportunities in the animal and biomedical sciences.

Purpose:
- To provide and promote education, research, extension and service in the animal, veterinary, and microbiological sciences
- To provide support and leadership in Arizona in the areas of biomedical sciences in the areas of Animal health and disease and to integrate these objectives with the broader goal of improving human health

2021 Vision:
Education:
- Enhancing curriculum and “hands-on” instruction whereby students served by our school can be the most competitive and prepared in their respective industries
- Creation of a ‘One-Health’ Professional Veterinary Degree Program

Research:
- A vibrant research community that seamlessly integrates findings across the spectrum of animal and human health and disease
- Provide research findings that can be applied to improve and increase production efficiency
- Conduct research that can be translated to drive the advancement of applied biomedical science

Service/Extension:
- Continue to provide leadership and education to animal agriculture
- Extension programs that convey the findings from our research to communities
- Enhance our diagnostic capabilities
- Continue to grow the areas of food products and food safety

Mission:
- To serve society by delivery of quality education programs to students and the general public
- Engage in basic and applied research
- Provide leadership through extension, outreach and service activities

Shared Values: We value
- Promoting health in animals and humans (“One Health”)
- Delivery of effective educational programing
- Creating and maintaining research programs that meet the needs of the community
- Generating financial resources
- Collegiality
STRATEGIC GOAL ONE: Enhance food safety education and research through development of a food safety center

A. Current situation and gap between current situation and desired situation
   Many job opportunities exist for students trained in food safety. Several faculty members are involved in research of current Food Safety issues focused upon by several funding agencies. In 2012, The Food Safety Consortium hosted its third annual meeting which involved faculty, students, industry partners and government agencies. This Consortium was well received. Additional collaborative and extension food safety programs are in place and gaining some prominence. However, currently there is an inadequate ability to fully train undergraduate or graduate students in the Food Safety area. This is due, in part, to a lack of facilities, equipment, funding, and/or faculty in the field.

B. Strategy/ies to achieve goal (list if more than one)
   - Develop the Southwest Food Safety Center of Excellence that encompasses the Current Food Safety Consortium faculty and resources and allows for greater investment in facilities, equipment, and faculty to effectively meet outreach, teaching and research goals.
   - Intensify consumer education through outreach programs that target food safety issues
   - Provide HACCP certification for small businesses and retail outlets
   - Seek additional industry collaboration and funding
   - Develop partnerships with the fresh produce growers in Yuma, AZ
   - Develop international training program
   - Beginning of collaboration with culinary groups to intensify food safety training (Pima CC, Tucson Culinary Arts)

C. Actions and Time Period (Fiscal Years)
   - Intensify work with Public Health Officials FY2013-FY2014
   - Develop Southwest Food Safety Center of Excellence FY2013-FY2014
   - Increase participation and funding from Industry FY2013-FY2021
   - Start a Graduate Program in Food Safety Sciences FY2014-FY2015
   - Create an associated Food Safety Degree Program FY2014-FY2015
   - Strategic hire for Food Safety teaching and research FY2014-FY2015
   - Add more Food Safety focused classes FY2014-FY2016
   - Continue to seek funding from government agencies FY2013-FY2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   - Investment in faculty and equipment for food safety related research
   - Development of new faculty in food safety field
   - Expanded facilities, and increased collaboration with existing facilities including the Agricultural Facilities both on campus and in Yuma

E. Objective metrics that will be used to track progress towards attaining goal
   - Development of food safety center with research, teaching, and outreach aims
   - Graduate and undergraduate student enrollment
   - Research Funding
   - Publications
   - Industry participation and collaboration in food safety research
   - Utilization of facilities and equipment for food safety research
   - Number of hits on the website

Notes (if any)
STRATEGIC GOAL TWO: Maintain and strengthen the Environmental Biology Program (Physiology, Nutrition, Reproduction/Perinatal Environment) that utilizes the unique facilities at the ARC

A. Current situation and gap between current situation and desired situation
Currently, a strong program and faculty is limited by an under-developed facility. There has been loss of faculty due to limited resources. We have 1 senior faculty and 2 new junior faculty members who study different aspects of nutrition. The recent hire of an extension beef person trained in nutrition provides a critical mass for integrated research in nutrition. There is a strong interest/expertise in areas that are priorities of funding agencies such as:

- Impact of global warming/Adaptation to hot environments
- Obesity
- Effect on intra-uterine growth
- Pre- and Peri-natal programming
- Control of feed/food intake

B. Strategy/ies to achieve goal (list if more than one)
- Develop a physical plan to complete facilities to best meet the need of current and future faculty
- Raise money through grants/gifts
- Form a Center for the Study of Global Warming Impacts on Domestic Animals including members from Agricultural and Biosystems Engineering, Animal and Comparative Biomedical Sciences, Agricultural Economics, and Soil and Natural Resources
- Form a Center for the Study of Obesity including members from Animal and Comparative Biomedical Sciences, Nutrition, Physiology, and the Norton School of Family and Consumer Sciences.

C. Actions and Time Period (Fiscal Years)
- Complete blueprint for new facilities at ARC FY2013-FY2014
- Develop Center for the Study of Global Warming Impacts on Domestic Animals FY2013-FY2015
- Develop Center for the Study of Obesity FY2013-FY2015
- Fundraising for existing and new ARC facilities FY2013-FY2016
- Construction of New Facilities at ARC FY2014-FY2016

D. Inputs needed to achieve the goal (do not limit to financial inputs)
- Leadership
- Plans from faculty teams that share common research, teaching, and extension goals in nutrition, reproduction, environmental physiology, and food safety
- Funding

E. Objective metrics that will be used to track progress towards attaining goal
- Blueprints for new facilities
- Centers Established
- Faculty teams formed
- Publications
- Grant Funding
- Graduate student quality and quantity
- Funding benchmarks
- Building completion

Notes (if any)
STRATEGIC GOAL THREE: Strengthen and Support Existing Genomics and Bio-Informatics Endeavors

A. Current situation and gap between current situation and desired situation
   There are opportunities for faculty in the school to expand their research programs by incorporating elements of bio-informatics and/or genomics. This is an opportunity that is not being met due to problems with access. There is also the need for undergraduate and graduate training in bio-informatics so that students have the skills necessary to access the future job markets.

B. Strategy/ies to achieve goal (list if more than one)
   - Develop Bioinformatics courses for graduate and undergraduate students
   - Provide outreach and training for faculty and postdoctoral fellows within the school
   - Provide cyberinfrastructure for the school personnel to acquire, manage, analyze and visualize large genomics data sets. This may be provided at a departmental, college or institute level and should include leveraging links with existing campus initiatives.

C. Actions and Time Period (Fiscal Years)
   - Add undergraduate and graduate genomics/bioinformatics course FY 2013-2014
   - Increase awareness of existing cyber infrastructure and identify unmet needs FY 2013-2015
   - Provide training workshops for interested faculty and postdoctoral fellows FY 2014-2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   - Faculty and TA time commitment to developing new course work
   - Access to training opportunities (including registration, travel costs)
   - Strengthen links to UA core genomics facilities (such as CGC, BIO5)
   - Access to data storage and analytics

E. Objective metrics that will be used to track progress towards attaining goal
   - Number of grant submissions with bio-informatics/genomics components
   - Number of our school student’s that complete bio-informatics training
   - Number of faculty and postdoctoral fellows attending new training opportunities
   - Increase in high throughput data submissions to public repositories

Notes (if any)
STRATEGIC GOAL FOUR: Maintain and Strengthen Reproductive Physiology Discipline In Animals and Humans

A. Current situation and gap between current situation and desired situation

The Animal Scientists of the school are working to develop a leading teaching and research resource in Reproductive Biology at the UA. Recent hires in this area provide expertise in follicular development (Craig), luteal physiology (Bogan), and neuroendocrinology (Renquist). The school houses established programs in fetal physiology, endocrinology, and pathophysiology (Limesand) and applied equine reproduction techniques and breeding management (Arns).

B. Strategy/ies to achieve goal (list if more than one)

- Form a research program (or center) designed to improve animal and human reproduction
- The newly formed team of researchers will capitalize on individual researcher interests and expertise to address current issues in female reproduction performance, environmental limitations (e.g. heat stress and toxicology), and human health complications associated with sexual dimorphism
- An additional faculty member in male reproduction will complete the currently assembled team’s expertise and be able to interact with Dr. Sheldon Marks at the International Center for Vasectomy Reversal.
- Creation of the reproductive program will provide mentoring to young scientists and form collaborations that benefit basic research, undergraduate and graduate training, and production management for both established and new faculty
- Complete facilities at Agricultural Research Center that support basic research in animal models for reproduction and pregnancy (sheep)
- Ensure that new hires in reproductive physiology, and other aspects of basic science disciplines, add new expertise that compliments new and current research programs.
- Collectively the researchers will use sheep as an animal model for other livestock industries and human health, which will require a flock for both research and teaching purposes. This will need to be developed as a self-sustaining unit at the UA.
- Strengthen interactions with clinicians in Ob/Gyn at the UA – resident and fellowship training as well as translational research
- Strengthen interactions with academic programs: physiology, pharmacology, and BIOS5

C. Actions and Time Period (Fiscal Years)

- Develop research teams and global research goals FY 2013-2016
- Establish Program/Center in Reproductive Biology FY 2013-2015
- Develop facilities at ARC to accommodate research goals FY 2014-FY2015

D. Inputs needed to achieve the goal (do not limit to financial inputs)

- Cooperation amongst faculty to develop research projects that utilize the team’s expertise
- Development of facilities
- Additional expertise in male reproduction, bioinformatics, statistical analysis, computational biology, and endocrinology

E. Objective metrics that will be used to track progress towards attaining goal

- Grants (individual and multi PI funding from NIH, USDA, and private foundations)
- Generation of new knowledge that is presented as peer reviewed reports, but also translate in to increased animal fecundity and performance and improved women’s health
- Collaborations with private and academic programs in UA, Tucson, and Arizona

Notes (if any)
STRATEGIC GOAL FIVE: Maintain Existing Unique Shrimp Pathology and Aquaculture Program

A. Current situation and gap between current situation and desired situation
   The current program has impressive ties to the industry and outstanding faculty and facilities in place. However, low faculty numbers limit course offerings and program longevity.

B. Strategy/ies to achieve goal (list if more than one)
   • Increase awareness of current program features
   • Encourage long term maintenance of existing facilities

C. Actions and Time Period (Fiscal Years)
   • Continue existing course offerings and graduate study FY2013-2021
   • Maintain industry collaboration and continue to seek outside funding opportunities FY2013-2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • Continued faculty and administrative support

E. Objective metrics that will be used to track progress towards attaining goal
   • Relevant course and graduate studies enrollment
   • Research funding and publications

Notes (if any)
STRATEGIC GOAL SIX: Expand international focus of Race Track Industry Program (RTIP)

A. Current situation and gap between current situation and desired situation
   The RTIP is a unique program with international recognition. It sponsors a yearly Race Track Symposium that boasts about 18% international attendance. In addition, RTIP has both a successful graduate and undergraduate program and has produced hundreds of alumni who have gone out to work in the industry. In 2006 a master’s degree program was started. The graduate program is currently limited due to resources and it could grow.

B. Strategy/ies to achieve goal (list if more than one)
   • Increase attendance at the Global Symposium on Racing & Gaming by expanding our international focus
   • Continue exchange programs with the 2 Irish Universities
   • Maintain the Executive in Residence Program
   • Develop distant learning courses with international appeal
   • Fill the endowed chair position to expand the graduate program

C. Actions and Time Period (Fiscal Years)
   • Add international event and content @ Symposium FY 2013-2014
   • Attend Asian Racing Conference to promote FY 2013-2014
   • Develop online content/classes FY 2013-FY2016
   • Measure Symposium progress and change accordingly FY2013-FY2014
   • Maintain Executive in Residence FY2013-FY2017
   • Endowed chair search/hire FY2015-2016

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • Training to prepare distant learning courses
   • Contact foreign stakeholders to track needs
   • Consider faculty with foreign racing expertise (Endowed chair?)
   • Partial salary line for endowed chair

E. Objective metrics that will be used to track progress towards attaining goal
   • Measure total Symposium attendance and international attendance
   • Number of Executives in Residence
   • Number of exchange students
   • Number of people signed up for distant learning courses
   • Endowed chair hired

Notes (if any)

Currently we do not have the staff to service graduate students in the manner in which the program was designed. We currently only accept 2 or three applicants per year due to the ability with current resources to provide the needed experience. We have declined qualified applicants in some years.
STRATEGIC GOAL SEVEN: Expand current human health research, collaboration, and teaching in the area of microbiology

A. Current situation and gap between current situation and desired situation
Several active faculty projects currently focus on pathogenesis of bacterial and parasitic human disease and related research. This is an area of study attractive to current and future students, and current class offerings dovetail nicely with the program. However, these could be expanded. Currently studied pathogens represent areas of importance for government funding agencies but Industry collaboration in this area remains relatively low.

B. Strategy/ies to achieve goal (list if more than one)
- Increase course offerings in the area of human pathogens, medical microbiology, etc.
- Strategic faculty hires
- Increased collaboration with BIOS and AHSC
- Increased collaboration with industry partners

C. Actions and Time Period (Fiscal Years)
- Hire additional research and teaching faculty FY2013-FY2015
- Expand course offerings FY2014-FY2016
- Increase funding and extension through collaboration FY2014-FY2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
- Increased faculty
- Updated and expanded facilities

E. Objective metrics that will be used to track progress towards attaining goal
- Grant funding
- Number of faculty doing research with a human disease focus
- Enrollment in relevant courses housed in the department

Notes (if any)
STRATEGIC GOAL EIGHT: Revitalize virology program

A. Current situation and gap between current situation and desired situation
Current department faculty members have some virology experience, but are not primarily focused on virology research at this time. Virology research at University of Arizona currently occurs in BIOS and Plant Pathology but there is little to no outside funding for virology. Due to faculty retirement, human/animal Virology courses are not currently offered.

B. Strategy/ies to achieve goal (list if more than one)
- Increase virology faculty
- Offer previously existing and new virology course work
- Increase graduate student research in Microbiology area of the new School of Animal and Comparative Biomedical Sciences

C. Actions and Time Period (Fiscal Years)
- Strategic hire of faculty with existing research funding FY2013-FY2015
- Expansion of virology based course work available FY2014-FY2015
- Continue to seek additional funding and possible industry collaboration FY2014-FY2021
- Continued faculty expansion FY2014-FY2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
- Facilities update/expansion

E. Objective metrics that will be used to track progress towards attaining goal
- Enrollment in virology course work
- Graduate research in virology
- Research funding
- Research publications

Notes (if any)
STRATEGIC GOAL NINE: Increase undergraduate enrollment and program diversity

A. Current situation and gap between current situation and desired situation
Recent website redesign at the University (degree search), college and departmental levels provide increased exposure and information for incoming students. Added to our other recruitment activities, undergraduate enrollment has increased over the past several years in all three majors: Animal Science, Veterinary Science, and Microbiology. We have excellent undergraduate scholarship opportunities and funding for both animal science and veterinary science. Advising of these undergraduate has been a challenge due to limited financial resources, and the advisor to student ratios have been maximized. With the new school and focus on biomedical sciences, we anticipate and strive to double our undergraduate enrollment. To do this, we will need more resources to hire advisors as well as increase course offerings/capacity, as many of the courses offered currently are at maximum capacity.

B. Strategy/ies to achieve goal (list if more than one)
• Increase faculty numbers through creation of a school and strategic hires
• Expand undergraduate scholarship opportunities
• Increase class offerings; whether it is by offering more or larger sections, or reorganizing some of these classes to be offered either partially or completely online
• Add additional major option focusing on basic lab animal care/management
• Reorganized and expand advising capacity
• Take advantage of the lower tuition at University of Arizona relative to the University of California to attract students through more recruitment efforts in California

C. Actions and Time Period (Fiscal Years)
• Strategic faculty hires for additional research and teaching and advising FY2013-FY2017
• Introduction of additional majors or options FY2015-FY2019
• Addition of course offerings for undergraduate programs FY2013-FY2016
• Continue to seek increased and new funding sources to support current and future students FY2012-FY2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
• Increased graduate student teaching opportunities provided by addition undergraduate course offerings
• Increased funding and new funding sources
• Expanded program offerings

E. Objective metrics that will be used to track progress towards attaining goal
• Student enrollment and retention/graduation rates in relevant majors
• TA/RA funding
• Scholarship awards

Notes (if any)
STRATEGIC GOAL TEN: Maintain and expand focus of core research, teaching, and extension programs in dairy, beef, and equine sciences

A. Current situation and gap between current situation and desired situation

The facilities for beef feedlot research are outdated and need upgrades. There is no dairy research facility that allows for production level research – Plans are currently being developed for a facility that would work in conjunction with the completed ARC facility to meet this need. Experienced faculty, hired during the past two years, focus on both dairy and beef extension and will help these programs. Additionally, establishment of extension, teaching, and research programs in equine sciences focused on reproduction and nutrition have occurred. However, there is a lack of all livestock species on-site to provide for hands-on teaching experiences.

B. Strategy/ies to achieve goal (list if more than one)

- Develop a plan for campus agriculture center that includes animal agriculture and increases teaching and extension capabilities through facility development and increased animal availability.
- Maintain and develop closer ties with animal agriculture throughout the state.
- Work with AMPHI High School Agriculture Program to develop hands-on experiences as well as mentoring between college and high school students.

C. Actions and Time Period (Fiscal Years)

- Develop a campus agriculture center master plan
  FY2012-FY2017
- Create and maintain strong relationships with dairy, beef, and equine industry partners
  FY2012-FY2021
- Execute campus agriculture center master plan
  FY2014-FY2021
- Fundraising for facility development
  FY2014-FY2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)

- Administrative commitment to campus agriculture center master plan development and implementation
- Support from animal agriculture industries in the state to the plan
- Faculty leadership to follow through on the plan
- Commitment from campus agriculture center to the plan

E. Objective metrics that will be used to track progress towards attaining goal

- Development of master plan
- Facility development
- Animal numbers for teaching and extension programs
- Funds obtained to execute plan

Notes (if any)
STRATEGIC GOAL ELEVEN: Direct teaching efforts to address lack of knowledge of production animal systems in a student population that comes from predominantly urban centers.

A. **Current situation and gap between current situation and desired situation**
   Students entering the animal science and veterinary science programs lack production animal agriculture experience because many come from urban areas. The lack of hands-on teaching opportunities resulting from inadequate animal numbers and facilities prevents students from acquiring the practical experiences needed to obtain a job in any production animal system. Furthermore, limited coursework on production animal systems is available due to faculty time limitations. Because of these deficiencies, a student-run club was formed, whose goal was to teach fundamentals of production agriculture from conception to the table. In theory, this was a good idea, but this club lacks the guidance of trained, experienced faculty, and students teaching students does not necessarily provide the right experiences. Our faculty wants to ensure that each and every student has a hands-on education in which not only are outcomes realized, but skill competencies as well.

B. **Strategy/ies to achieve goal (list if more than one)**
   - Develop animal sources and facilities to house agricultural animals that can be used to teach fundamental of production animal agriculture and encourage participation in clubs that provide opportunities for hands-on production training
   - Develop courses that focus on production animal agriculture

C. **Actions and Time Period (Fiscal Years)**
   - Hire faculty FY2014-FY2017
   - Develop production agriculture courses FY2014-FY2021
   - Create facilities to teach animal production FY2014-FY2017
   - Develop animal sources FY2014-FY2017
   - Encourage membership in existing student let production agriculture clubs FY2013-FY2021

D. **Inputs needed to achieve the goal (do not limit to financial inputs)**
   - Animals
   - Faculty
   - Facilities

E. **Objective metrics that will be used to track progress towards attaining goal**
   - Job placement in production animal agriculture
   - Retention and graduation rates of students

**Notes (if any)**
There is currently no adequate system to maintain contact with previous graduates to track their development in the animal sciences/production field.
STRATEGIC GOAL TWELVE: Reorganize Graduate Programs and Increase Graduate Student Base

A. Current situation and gap between current situation and desired situation
   Graduate student applications and enrollment have steadily declined in both Animal Science and Microbiology, mainly due to lack of support funds for these students. As ERE increases, the existing graduate student funds have not stretched to cover as many students. Increased recruitment efforts are needed with emphasis on quality being paramount. In addition, having enough graduate student funding and enrollment are critical to the undergraduate teaching mission. As undergraduate enrollment increases, there will be a need for more TAs in the classroom helping faculty with classes. The Education Task Force has recommended that there be one graduate program in Animal and Comparative Biomedical Sciences with options in Animal Science, Microbiology and Pathobiology. This organization is to ensure that minimum numbers of graduate students at the Master’s and Doctoral levels are met to satisfy ABOR requirements.

B. Strategy/ies to achieve goal (list if more than one)
   • Increased recruitment of quality graduate students
   • Increased staff to focus on recruitment, retention, graduate tracking and advising
   • Increase TA/RA funding
   • Identify sources of new funds
   • Include graduate student salaries when applying for grants

C. Actions and Time Period (Fiscal Years)
   • Increased recruitment of graduate students FY2012-FY2021
   • Increase staff to handle student retention, graduate tracking, and advising FY2012-FY2014
   • Redefine the graduate program FY2013-FY2014
   • Increase TA/RA funding FY2013-FY2015

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • Commitment from department/school and college
   • Faculty leadership
   • Faculty willingness to advise graduate students

E. Objective metrics that will be used to track progress towards attaining goal
   • Graduate Student numbers
   • Retention rates
   • Career placement
   • TA/RA funding availability

Notes (if any)
STRATEGIC GOAL THIRTEEN: Expand Extension Programs and Integrate Research to Meet Extension Needs

A. Current situation and gap between current situation and desired situation
   Extension programs are in a state of rebuilding after a period of little or no activity due to reduced availability of extension faculty. Currently the research and extension programs are not well integrated and there is need to improve the relationship between the college/school and the state animal agriculture industries. Animal science produces a quarterly newsletter that distributes to over 800 shareholders which may be one way to rebuild these relationships. The AzVDL also sends out updates to its 700 clients. The majority of large departmental research projects include extension components. While collaboration with agriculture extension facilities exists, it is limited. Industry collaboration is a missed opportunity that needs to be expanded tremendously, particularly in human, veterinary and food safety areas.

B. Strategy/ies to achieve goal (list if more than one)
   • Develop strong dairy, beef, equine, veterinary and other appropriate extension programs
   • Create a roadshow for extension/research programs – One current program is Cow College
   • Increase faculty presence at industry functions
   • Develop campus facilities to support on-campus extension activities
   • Reactivate the “Ranch to Rail” and “Reservation to Rail” programs
   • Increase collaboration with existing partners including CAS, Yuma cooperative extension facility and V bar V ranch
   • Improve veterinary diagnostic and extension by creating remote interface facilities such as at V-V ranch
   • Expand industry contacts
   • Increase faculty/staff/student/administration involvement in the community

C. Actions and Time Period (Fiscal Years)
   • Provide support for equine extension FY2012-FY2021
   • Support new dairy, beef and veterinary extension program development FY2012-FY2015
   • Increase industry involvement in department/school FY2012-FY2021
   • Assess current extension programs and opportunities FY2013-FY2014
   • Add additional extension programs, particularly in human health and food safety divisions FY2014-FY2018
   • Increase industry involvement in department/school FY2012-FY2021

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • Additional money/staffing for equine extension at the department and college level
   • Support for new faculty in dairy/beef extension
   • Facilities to foster development of extension programs on campus and at remote sites
   • Faculty involvement in extension pursuits
   • Facilities to foster collaborative extension efforts
   • Increased staff/faculty funding for extension projects

E. Objective metrics that will be used to track progress towards attaining goal
   • Number of extension programs
   • Campus agricultural center visitor numbers
   • Industry funding
   • Extension publications
   • Grant funding for extension programs
   • Faculty % time devoted to service
STRATEGIC GOAL FOURTEEN: Establish a School of Veterinary Medicine

A. Current situation and gap between current situation and desired situation
ABOR has approved funding ($3 million) to study the feasibility of opening such a school at the Tucson campus of the University of Arizona, and we are awaiting the approval from the Governor and State Legislature. Arizona does not currently have a veterinary school and the WICHE program pays $1.4 million in support for students to attend out of state schools. Veterinarians are needed in Arizona, particularly in rural areas and for large animals. The current major in veterinary science provides many students qualified and competitive for veterinary medical college and would be the base from which to select for this professional program.

B. Strategy/ies to achieve goal (list if more than one)
• Use funding, if provided, to investigate the feasibility of such a school, including facilities, faculty, etc.

C. Actions and Time Period (Fiscal Years)
• Acquire funding for studies on feasibility of veterinary school FY2012-FY2013
• Assess requirements for new school and availability of resources FY2013-FY2014

D. Inputs needed to achieve the goal (do not limit to financial inputs)
• Initially, an assessment of feasibility, needs and available resources. Additional inputs may then be decided.

E. Objective metrics that will be used to track progress towards attaining goal
• Funding for initial studies.
• Approval for the establishment of a School of Veterinary Medicine.

Notes (if any)
STRATEGIC GOAL FIFTEEN: Revise Undergraduate and Graduate Curriculum

A. Current situation and gap between current situation and desired situation
The undergraduate and graduate curriculum for all three majors is working well. However, there is a lack of stand-alone graduate level courses. Additionally, there are some areas of the undergraduate curriculum that has not been a focus due to loss of instructors. If the department is going to produce graduates with the knowledge and skills to be employable in the industry, course redesign is needed to make the majors more well-rounded.

B. Strategy/ies to achieve goal (list if more than one)
- Review course content and focal areas
- Consider how best to include material that is missing from a well-rounded curriculum
- As a group, evaluate what is necessary versus luxury
- Consider current teaching assignments and how they may be maximized in the best possible way

C. Actions and Time Period (Fiscal Years)
- Curricular review FY2013-2014
- Course modifications FY2013-2015
- If possible, faculty hires FY2014-2015

D. Inputs needed to achieve the goal (do not limit to financial inputs)
- Curricular committee time to evaluate course material
- Course development
- Financial support to teach courses
- Availability of faculty to teach the necessary courses

E. Objective metrics that will be used to track progress towards attaining goal
- Student enrollment
- Student retention
- Student graduation rates
- Student Credit Hours completed
- Career placement of graduates

Notes (if any)
Campus Arboretum
CAMPUS ARBORETUM 2021 STRATEGIC PLAN

Purpose: to mitigate the impacts of urbanization on environmental and human health.

1. Develop and implement sustainable landscapes on campus.
2. Leverage partnerships with UA researchers in environmental and human health fields.
3. Educate students as the future scientists, civic leaders and land managers.
4. Engage citizens as landscape stewards through education, citizen science and outreach.

2021 Vision: To be a global leader in sustainable urban landscape development. To serve as a central, unifying program, that communicates, through its function as a living laboratory, the UA commitment and expertise in environmental, social and economic sustainability. To achieve this vision, the Campus Arboretum will unite and fully integrate into, the UA administrative processes overseeing landscape development and management, create partnerships with UA researchers and develop programs that engage students and citizens in formal and outreach education. These efforts will enhance campus development so that it strategically aligns to support, compliment and display UA research and educational expertise in environmental and health sciences. The Campus Arboretum will provide guidance and expertise to campus development and engage students in its implementation. Educational programs will train and involve both students and the community through interpretive, educational opportunities aimed at connecting the current and future population in this and other urban, arid regions globally, with the technologies generated and innovations developed by the UA that reduce resource consumption, promote healthy ecosystems, individuals and communities. The creation of these tangible displays will not only further establish the UA as a leader in environmental urban stewardship but also enhance the UA role as a major destination for conservation education. Collectively, these efforts serve to promote citizenship and aim to mitigate the negative environmental and human health impacts of a rapidly growing and increasingly urban population.

Mission: The UA Campus Arboretum is a living laboratory promoting stewardship and conservation of urban trees through research, education and outreach. To realize this vision will require:

● Active support from the UA administrative units with oversight for campus landscape development and management.
● Strong collaborative ties with UA research and instructional units to develop landscape exhibits for formal and outreach educational programs.
● Online resources and web-based tools which make the campus model accessible globally.
● Independently funded programs devoted to the development and implementation of sustainable landscapes for urban, arid climates.

Shared Values: The world’s population is growing and humanity has largely adopted urban areas as its primary choice of habitat. Urbanization has concentrated the impacts of population growth and has created profound environmental, economic, and social implications for the world’s future. Urbanization has resulted in catastrophic loss of biodiversity, ecosystem degradation, landscape fragmentation, climate change as well as a cultural disconnect between the environment and the population it supports. Although trees are fundamental to healthy ecosystem and provide cultural, social and therapeutic benefits for humans, current landscape development and management practices reduce significantly reduce their longevity and are ineffective in restoring the ecosystem services lost during urban development. As a major urban population in an arid climate, the UA campus location affords a unique opportunity to leverage its expertise as a Tier I research school, develop sustainable management practices, catalog and expand biodiversity and display these innovations on the campus grounds as a model of sustainably living with less in an increasingly populous world. Further, historic preservation and cultural significance of the campus collections increase the potential for impact by creating community connections, generating loyalty and attracting a variety of visitors.

Summary: This document represents a single goal with supporting actions that will position the UA Campus Arboretum to 1. develop innovative solutions to landscape sustainability, 2. enhance landscape development that showcases UA expertise in environmental conservation, 3. engage a broad audience, including students, researchers and citizens aligned with our mission to maximize the environmental, economic, social and cultural benefits landscapes provide. Included in this document are plans for establishing and enhancing connections to UA research, instruction and administrative units as well as other community, regional and national entities.
STRATEGIC GOAL ONE: 
Expand/enrich Undergraduate Experience and Success

A. Current situation and gap between current situation and desired situation
The Campus Arboretum continues the century long tradition of the UA College of Agriculture in promoting the land stewardship critical to sustain population growth and the health of people and the environment in an arid climate with limited natural resources. The campus grounds serve as a living laboratory providing resources to support research, promote biodiversity, model conservation and preserve the culture and history of the region. Because of the global relevance and regional significance of these objectives, the Campus Arboretum seeks increased visibility, enhanced opportunities for participation in campus development and management as well as additional resources to engage students, develop vigorous extension programs and engage students and the public through outreach and service.

The Campus Arboretum aims to:
1. Participate in campus planning and management decisions.
2. Increase and catalog collections biodiversity and expand and disseminate accessions data.
3. Develop and implement sustainable landscape practices appropriate for the SW and other arid urban settings.
4. Increase visibility and utility of arboretum resources to a broad regional and global audience.
5. Actively engage students, faculty and industry through educational programs, outreach and online technologies.
6. Continue to support arboretum programs through donations and other extramural funds.

B. Strategies to achieve goal
1. Establish a steering committee to develop and institutionalize the Sustainable Sites landscape standards.
2. Establish a collaborative CALS Center for Biodiversity.
3. Develop extension programs addressing urban sustainability.
4. Increase marketing and publicity locally, and expand our online presence.
5. Create a student club and connect with the community in other ways through outreach industry partnerships.

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Create a Facebook page.</td>
<td>FY12</td>
</tr>
<tr>
<td>2. Upgrade website to improve data access and promote interaction with the public.</td>
<td>FY12</td>
</tr>
<tr>
<td>3. Develop web-based tools for collection of grounds maintenance data and future decision-support.</td>
<td>FY12-13</td>
</tr>
<tr>
<td>4. Provide and market public tree tours (Master Gardener’s Tree Stewards)</td>
<td>FY12</td>
</tr>
<tr>
<td>5. Create partnerships with local nurseries to increase collection diversity.</td>
<td>FY12</td>
</tr>
<tr>
<td>6. Develop, implement and institutionalize sustainable sites landscape standards on campus.</td>
<td>FY13</td>
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<tr>
<td>7. Establish a CALS Center for Biodiversity.</td>
<td>FY13</td>
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<tr>
<td>8. Identify campus collections or sites to focus a sponsorship campaign.</td>
<td>FY13</td>
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<tr>
<td>9. Organize students to form a club to support the UA Community Gardens, harvest events and tours.</td>
<td>FY13</td>
</tr>
<tr>
<td>10. Organize public harvesting events for olives (fall) and citrus (spring).</td>
<td>FY13</td>
</tr>
<tr>
<td>11. Install new signs and improve interpretive plaques. (QR codes)</td>
<td>FY14</td>
</tr>
<tr>
<td>12. Compete the arboretum inventory. (succulents, cacti, shrubs, vines and ground covers)</td>
<td>FY14</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Database management, IT support and web development. (actions 2, 3 and 7)
- Grounds liaison to facilitate database content management. (actions 3, 6, 9 and 10)
- Administrative, marketing, publicity and development support. (actions 4, 8, 9 and 10)
- Educational program and volunteer coordinator. (actions 4, 6, 7, 9, 10, 11 and 12)
- Student workers or volunteers. (actions 4, 9, 10, 11, 12)

E. Objective metrics that will be used to track progress towards attaining goal
● Funding and donations.
● # of sponsorships.
● Online resource use. (web hits)
● # tours.
● # of participants in tours and outreach events.
● # talks, workshops and attendees.
● # of industry partnerships.
● Size of student club.
● # of club activities.
● # of volunteer hours.
Communications and Cyber Technologies
CALS COMMUNICATIONS AND CYBER TECHNOLOGIES
2021 STRATEGIC PLAN

PURPOSE:
To make CALS the most cyber-savvy College at the University of Arizona

2021 VISION:
- To become a hybridized team of data specialists, designers, developers, systems integration experts, classroom technologists, and cyber consultants /educators who are abreast of new and emerging technologies.
- To have wide-scale adoption from CALS’ faculty and staff of the cyber technologies that we promote, educate, and develop internally or partner externally.
- To be considered as the model example of a College Communications and IT Unit that other Universities look at when organizing IT resources within their own College.

MISSION:
To support faculty and staff in their use of cyber technology as they pursue research, instruction, and outreach objectives, and in their effort to meet the UA “Never Settle” goals

SHARED VALUES
- Adaptability: Our team is composed of self-starters who adapt to change in technology and industry, keeping CALS on the cutting edge.
- Innovative: We dedicate time to incubate new ideas and encourage each other to cultivate outside-of-the-box strategies.
- Quality: The products and services we offer are given our best effort. We’re detail-oriented and take pride in our work.
- Humility: Not all of our designs and innovations work as planned. We can admit defeat, learn from mistakes, and embrace constructive criticism.
- Integrity: We believe in delivering CALS with the best service possible, even if that means outsourcing a project or service that is recognizably better. We always have CALS’ best interest in mind.
- Inclusivity: We’re an open and engaging team that seeks opportunities to partner with the college and campus community to develop new initiatives.
- Trustworthy: We believe in a responsible and honest work environment, both among our team members and the faculty, staff, and students we serve.
- Engaging: We pride ourselves on our human aspect of Cyber technology. We are educators, partners, and consultants, not just “bit-heads”. We meet in person when possible and always welcome walk-ins.
• Entrepreneurial: We must be business-savvy with both state and soft-money resources and continually look for new funding opportunities.

**IT Background:**

The IT industry is currently going through another periodic paradigm shift. Major new developments and technologies include cloud, Big Data, ubiquitous broadband and mobile. We can take advantage of all these to boost productivity during times characterized by flat budgets and limited investment. The IT technologies alluded to in this document are those that the campus IT community agrees are the most relevant to the University mission.

**ABOR Expectations:**

Below are the 2020 expectations ABOR has for the UA. FY 2020 figures (outer ring) are Enterprise targets. Actual figures (inner ring) reflect the most current data available for each metric. The data rings are color-coded as follows: **2012—13 Actuals** and **2008—2009 Actuals**.
These goals are exceedingly challenging, especially with flat budgets for UA and for the funding agencies who could boost our revenues. Our investments will have to be well-chosen but they can be leveraged with IT. In other words, it is the presumption of this document that IT can relieve the pressure of these times and is in fact critical to surviving them.

**Never Settle, College Mission, and IT Tied Together**
President Hart has abstracted the ABOR goals with 4 expressions – *Engaging, Innovating, Partnering and Synergy*. These expressions roughly align with the major areas of CALS, Instruction, Research, Outreach and Administration. This strategic plan aligns IT initiatives with those areas and draws on the new technologies to map out directions and outcomes.

<table>
<thead>
<tr>
<th>ABOR GOALS</th>
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<tbody>
<tr>
<td>UA Goals</td>
<td>Engaging</td>
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<td></td>
<td>Innovating</td>
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<td></td>
<td>Partnering</td>
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<td></td>
<td>Synergy</td>
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<tr>
<td>CALS Strategic Goals</td>
<td>Instruction</td>
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<td></td>
<td>Research</td>
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<td></td>
<td>Extension/Outreach/Land Grant Mission</td>
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<tr>
<td>CALS IT Goals</td>
<td>Cyber-intelligence</td>
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<td></td>
<td>Cyber-innovation</td>
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<td>Cyber-communications</td>
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<td>Cyber-efficiency</td>
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<tr>
<td>Technologies</td>
<td>Academic Technologies, Cloud, BYOD/MDM, Social Media, Video, Broadband, Web Mobile</td>
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<tr>
<td></td>
<td>Big Data, Site Licensing, Cloud, Research Ecosystem, Identity Ecosystem, Data Research Ecosystem/Portal</td>
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<tr>
<td></td>
<td>Ubiquitous Broadband, BYOD/MDM, Enterprise GIS, Web Mobile Identity Ecosystem</td>
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<tr>
<td></td>
<td>Ecommerce, Dashboard Use, Resource Management, Enterprise GIS, Identity Ecosystem</td>
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<tr>
<td>Applications and provisioning</td>
<td>LMS, ePortfolio, smart classrooms, mobile education, student personal cloud, AWS, Google share, academic analytics, ADE partnering, academic BYOD, ubiquitous community broadband, cloud –based learning, real time learning in the field</td>
</tr>
<tr>
<td></td>
<td>BioComputing, Retail, Internet2, Geomatics, virtualization, take advantage of shared campus IT, grants, research analytics, eduperson, 3D bioprinters</td>
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<tr>
<td></td>
<td>Grants (NTIA) partner with ATIC, state and community IT, client BYOD, distance learning, drone technology, video Big Data and analytics, fiber overlay to offsite locations, voice-in-the-cloud</td>
</tr>
<tr>
<td></td>
<td>Boost support with tighter integration of CALS IT, common help desk, administrative analytics, staff and faculty professional cloud, object code update, alumni/develoment IT, voice in the cloud, virtual desktops</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Core competencies, critical thinking skills, learning discovery, tracking, retention and graduation (advising), jobs (career mapping) alumni and development, life-long learning</td>
</tr>
<tr>
<td></td>
<td>Research discovery, increase research $, do more with flat budgets, research-based jobs, technology transfer, facilitated data management planning/sharing, Data discover</td>
</tr>
<tr>
<td></td>
<td>Knowledge transfer, citizen science, diagnostics (e.g. Mobile plant and animal diagnostics), internships, impact evaluation, knowledge management (e.g. from newsletters to Global Rangelands Knowledge System)</td>
</tr>
<tr>
<td></td>
<td>IT optimization, better faculty/staff support and online resources, extramural $ through alumni and development,</td>
</tr>
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</table>
STRATEGIC GOAL ONE:
EMBRACE ACADEMIC TECHNOLOGIES THAT INFLUENCE ENROLLMENT AND IMPROVE THE LEARNING EXPERIENCE OF CALS’ INCOMING, CURRENT, AND GRADUATING STUDENTS (CYBER-INTELLIGENCE)

A. Current situation and gap between current situation and desired situation
CCT provides support for lecture-capture and distance learning tools (e.g. video conferencing). While these tools allow for CALS to reach a wider audience, they fall short of improving the educational experience and do little to elevate the students’ cyber intelligence. The desired situation involves the use of current and future technologies that utilize mobility and real-time collaboration, strengthens critical thinking skills, and allows students to better promote themselves when entering the workforce.

B. Strategies to achieve goal
- Help shape CALS core competencies, as determined by Career and Academic Services (CAS) that reward students for enrolling in extra classes/short-courses that elevate cyber intelligence
- Build or purchase collaboration tools that help students discover and work with each other, in real-time, from anywhere
- Create a digital platform that assists students in marketing themselves to future employers
- Improve systems that track students’ academic progress, from recruitment through employment, which can identify patterns that increase retention and maps careers to students’ strengths and academic success

C. Actions & Time Period
- Implement an ePortfolio system that tracks students’ accomplishments online  (FY16)
- Incorporate CCT staff into College and University-wide committees that influence the use of educational technology  (FY15)
- Attend Educause and similarly focused conferences  (FY15-18)
- Build out a “smart classroom” in CALS’ buildings on a staggered scale, so that CALS is continually purchasing new equipment and technology  (FY15-18)
- Become experts in academic technology offered by Google, IBM, Adobe, Blackboard, etc.  (FY15-18)

D. Inputs needed to achieve the goal
- Increased collaboration with Career and Academic Services
- 1.0 FTE, that could be shared among CCT and CAS, that assists D. Bogner in developing and/or recommending purchase of academic technologies

E. Objective metrics that will be used to track progress towards attaining goal
- Increase in enrollment and retention
- Increase in students graduating with elected core competencies
- Increase in job-placement among CALS’ graduates
STRATEGIC GOAL TWO:  
BECOME EXPERTS IN CYBER TECHNOLOGY THAT BENEFITS CALS’ RESEARCH AND GROWS INNOVATION (CYBER-INNOVATION)

A. Current situation and gap between current situation and desired situation  
Currently, there are just a handful of CALS faculty that utilize cyber technology in their research. Additionally, CCT is behind the curve on research technologies such as Big Data, high performance computing, and cloud solutions. Gap analysis is difficult to outline because CALS lacks the analytic tools needed to determine which areas of research are being done at a College-wide level. The desired situation involves the development of online tools that track research initiatives, builds linkages across departmental boundaries, stores and retrieves research data in a central repository, and builds a knowledge base of data management plans, tutorials, and guides. This would lead to a wider adoption of cyber technology in all of CALS disciplines in which CCT becomes a center for assistance, consulting, and training in research-directed technology.

B. Strategies to achieve goal  
- Focus CCT’s effort on developing internal tools and resources that parallel CCT’s capacity for developing fee-based websites and mobile apps  
- Shift effort away from providing IT services that can be better served at UITS or in the cloud.  
- Become data specialists and systems integrators that have a broad understanding of varying cloud and big data offerings, and use that knowledge to offer consulting services to CALS’ researchers

C. Actions & Time Period  
- Migrate email services to UITS (FY15)  
- Build out redundant infrastructure in UITS’ data centers that run on virtualized technology which provides scalability, improved uptime and automated systems administration processes (FY15)  
- Build a new research portal website for CALS (FY15-16)  
- Build a queryable Big Data repository to house CALS research (FY16)  
- Invest time and energy into understanding cloud offerings from Amazon and IBM (FY15-16)  
- Replace aging cyber infrastructure with Amazon Web Services (FY17)  
- Engage and follow upon recommendations from the Cyber Infrastructure Advisory Group (FY15-18)  
- Partner with other UA entities that provide on-premise cyber infrastructure solutions (FY15-18)

D. Inputs needed to achieve the goal  
- An additional 1.0 FTE web developer to focus on the development of internal online resources aimed at CALS’ researchers  
- A new 0.5 - 1.0 FTE data specialist that would assist faculty in leveraging cyber technology in their research  
- A flexible accounting model that allows for funding CCT staff and purchasing cloud resources with grant-generated revenue

E. Objective metrics that will be used to track progress towards attaining goal  
- Increase in grant awards within CALS  
- Increase in time saved by migrating services to UITS  
- Reduction in downtime of critical IT services
STRATEGIC GOAL THREE: DEVELOP PLATFORMS TO BRIDGE KNOWLEDGE FROM CAMPUS TO ACROSS ARIZONA (CYBER-COMMUNICATIONS)

A. Current situation and gap between current situation and desired situation
Currently, our constituents across Arizona are directly served by the Outreach effort of CALS Cooperative Extension. This effort is distributed via workshops, newsletters, in person visits, and more recently, video documentaries, webinars, social media and video conferences. Unfortunately, there is still a digital divide between campus and rural Arizona, both in physical infrastructure (e.g. networking, computing capacity, etc.) and in technical skills. The desired situation involves a stronger digital presence in the Counties that consists of ubiquitous high-speed broadband networks, which allow for retrieval of growing video content, remotely sensed imagery, real-time tele-diagnoses of plant and animal health, and fast access to online knowledge systems. Additionally, a stronger digital presence will make our county agents, specialists, and staff more efficient by leveraging IT resources for day-to-day operations such as improved digital file storage, VOIP, mobile device management, etc.

B. Strategies to achieve goal
- Migrate digital information found in electronic newsletters and listservs to online knowledge systems that can share and harvest information with each other
- Increase capacity to create professional, informative and interactive videos that showcase the research within CALS
- Build strategic partnerships with federal and state broadband agencies, such as NTIA and ATIC, as well as commercial broadband providers (e.g. Verizon, CenturyLink, etc) to improve the offsite network
- Provide a better mechanism to measure the impact of outreach via digital mechanisms to determine the effectiveness of online distributed content

C. Actions & Time Period
- Pursue the development of citizen science web and mobile applications and knowledge systems that disseminate on-campus research (FY15-18)
- Meet regularly with local telcos across the State to understand current and future broadband offerings (FY15-18)
- Provide our Experiment Stations with digital tools that utilize new technology (e.g. drones, in-the-field remote classroom video equipment, etc.) (FY15-18)
- Strengthen CCT involvement in the grant writing process (two a year) to take advantage of government offerings in rural network upgrades (FY15-18)
- Lobby UITS to spend strategic funds for network upgrades at our County offices (FY15-18)
- Build skillsets that leverage website analytic tools such as Google Analytics and social media outlets to measure effectiveness of online distributed content (FY15-18)

D. Inputs needed to achieve the goal
- Continued financial support from State and Federal agencies
- Hire students versed in social media and Google Analytics to assist in tracking impact

E. Objective metrics that will be used to track progress towards attaining goal
- Elevated awareness of CALS Cooperative Extension and the Arizona Experiment Station
- Increased awareness of CCT among Extension staff and faculty
• Increase in outreach/impact metrics
STRATEGIC GOAL FOUR:
EXPAND THE USE OF CYBER TECHNOLOGY WITHIN CALS’ BUSINESS SERVICE UNITS AND IT SUPPORT DESKS TO IMPROVE EFFICIENCY AND REDUCE COSTS (CYBER-EFFICIENCY)

A. Current situation and gap between current situation and desired situation
Currently, CALS utilizes a distributed model for providing business services and IT support to each of CALS’ academic Units. Specifically, each unit has their own business manager and IT desktop support team. This model is successful, but there are a growing number of cyber infrastructure offerings and online tools that would benefit each of these Units collectively. Unfortunately, we have been slow to develop and/or adopt these solutions. A desired situation would allow us to centrally build resource allocation tools, analytic dashboards, virtual desktops and servers, and IT common help desk tools. These types of tools reduce redundancy across the College, help make informed strategic decisions, save money, and gain efficiency in day-to-day operations. These tools would be collectively managed by CCT, CALS Business Services (CBS), and the CALS NetManagers.

B. Strategies to achieve goal
- Focus CCT’s effort on developing internal tools and resources that parallel CCT’s capacity for developing fee-based websites and mobile apps
- Through the UA IT Blueprint Group, partner with UITS’ in benefiting from centrally licensed software and cyber infrastructure offerings
- Improve the cohesion among the CALS NetManagers and CCT

C. Actions & Time Period
- Assist CBS’s Data Solutions in migrating and managing CALS business data from Parallax to Microsoft SQL Server (FY15)
- Build a codebase foundation for CBS’s Data Solutions team to build reports and custom dashboards for deans and department heads (FY15)
- Develop a knowledge base and IT handbook for CALS NetManagers (FY15-18)
- Build a space management toolset that leverages services from UAccess Space and the UA Campus Enterprise GIS (FY16)
- Promote the adoption of CATNET Active Directory Services (FY15-16)
- Work with the Almuni office to develop a customer relationship manager (CRM) system to help track alumni, assist in fundraising efforts, and develop targeted outreach programs (FY16-17)

D. Inputs needed to achieve the goal
- 1.0 FTE web developer to focus on the development of internal online resources (and to share with Goal #2)

E. Objective metrics that will be used to track progress towards attaining goal
- Improved efficiency in business operations
- Stronger IT support among all departments
- Increase in cash savings by reducing the number of redundant software and hardware purchases
Controlled Environment Agriculture Center
CEAC 2021 STRATEGIC PLAN  (05-21-12)

CEAC Purpose
The Controlled Environment Agriculture Center (UA-CEAC) of the College of Agriculture and Life Sciences at the University of Arizona is a research, teaching, and outreach program of the College. CEAC, through its staff and faculty, focuses on innovative technologies for the generation of food, bioenergy, and bioproducts to:

• Develop challenging research programs with application in science, engineering and practice;
• Educate students in a variety of settings and for varying purposes in best practices, creative approaches to problem-solution, engineering, and the methods of science; and
• Facilitate programs, events and materials for industry and the general public to learn more about the importance which Controlled Environment Agriculture (CEA) has in meeting current and future problems with creative, practical, and highly successful solutions.

CEA integrates science and engineering to maximize plant and biosystems productivity so that regulated, engineered environments have the capacity to maximize production and optimize use of resources including:

• Water
• Energy
• Land & Space
• Capital & Labor and
• Human Satisfaction.

CEAC has special, but not exclusive, focus within environments which are Arid, Semi-Arid, Urban and Extreme.

CEAC Vision
CEAC maintains and enhances global leadership, advancing CEA, by working to develop economically, socially, environmentally, and scientifically sound and sustaining agricultural methods, practices, knowledge, and results.

CEAC Mission
• Expand the science, technology, engineering and practical application of CEA while optimizing uses of water, energy, labor, land, human enterprise and other resources;
• Extend the knowledge and understanding of CEA to all Stakeholders and relevant Communities;
• Demonstrate that CEAC research can resolve significant plant and biosystems production challenges;
• Collaborate with University of Arizona departments and programs, other science, engineering and governmental organizations worldwide to promote and facilitate innovation and creative applications of CEA technology;
• Communicate CEAC programs and achievements, advances an action-reflection approach, increasing worldwide recognition, appreciation and information flows, for Research, Education, Extension and Outreach;
• Build a prosperous future where CEA assists global agriculture to produce clean, safe, abundant and affordable food for all.

CEAC Shared Values of Faculty, Staff, and Students
• Dedication to CEA - to enhance the knowledge and experience base for CEA, supporting applications of CEA in Arizona, the USA and the World.
• Dedication to our Professions - to each individual profession, working toward advancing practiced disciplines such as represented by ABE, SPLS, SWES, and others.
• **Collaboration with Academic and Research Programs** - to promote study and education with other academic programs at UA and throughout the world.

• **Partner with Business & Industry** - to help partners in business and industry to adopt CEA technology in feeding the people of the world with attention to security, nutrition, resource savings, safety, market needs and cultural constraints.

• **Pursuit of Excellence** - in professional, research, teaching and practice behavior; observing fairness, openness, and ethical demeanor, diversity, cooperation, communication and productive competition at UA and beyond.
Notes – Background

In 1998, the Arizona legislature, on recommendation from Governor Jane Hull, appropriated recurring funding of $700,000 a year to establish and operate The University of Arizona Controlled Environment Agriculture (CEA) program. There is a commitment for Plant Sciences (SPLS), Agricultural & Biosystems Engineering and Agricultural Education Departments (AgTech Management), which has been strongly encouraged, carefully organized and highly supported by the College of Agriculture and Life Sciences, to establish this multi-disciplinary educational, research and extension program in CEA. The Arizona greenhouse hydroponic vegetable crop production industry has invested more than $188 million during the past 11 years, to establish more than 250 acres of new construction specifically for vegetables, beyond the initial 100 acres. During this time period, the State has provided $7.2 million for UA-CEAC, representing a 25-fold leverage on funds. These greenhouse businesses became successful, in part, because of the favorable conditions within Arizona, including, a pleasant winter climate, sufficient high quality water and energy resources, efficient transportation infrastructure, and an available labor pool, but also with the activities of CEAC.

Although there is no ‘CEA Department’ with its ownership of a CEA academic program, there are faculty, staff and students from various departments, who are interested in biological and engineering projects related to CEA, who are brought together into project teams as part of the CEA program. These people participate at various levels and in complementary combinations of backgrounds within the education, research and extension programs and projects that support the Purpose, Vision and Mission of CEAC. The world is asking for help. We have the expertise and the facilities to provide services. We have the wherewithal to develop more (combined CEA experiences of CEAC faculty and staff amount to more than 275 years). We function within a climate which represents 40% of the world’s current development in CEA. There is a lack of education/expertise of people within the CEA industry (whereas there is a large pool of traditional field vegetable crops growers). There are limited research and teaching facilities throughout the USA and North America. CEAC has the potential, with the support of CALS and UA mechanisms, for developing self-support to expand to meet the demands.

CEAC is transfixed at the crossroads of the world’s initial experiences of finite resources for food production, and their resurgent desire for safe, secure and healthy foods. This is one of our strengths. We can remain at this high point of interest and support for the CEAC (and improve on it) because of the CEA technologies that are being researched, demonstrated and taught for future improvements, and for what we do today at CEAC in education and development of solutions using those technologies. Students both in USA and worldwide are looking to us for their educational programs leading toward careers in the food production industry. Agricultural businesses are planning financial support to facilities development for CEAC. The world has come to recognize UA-CEAC as one of the authorities on modern CEA during its 12 years of existence, and with foundation of 40 years of experiences at the UA in CEA at the Environmental Research Laboratory (ERL).

CEAC has had budget reductions equivalent to 50% for total operations since its inception; however through faculty and staff efforts it has procured other means for funding for operations to cover critical operations. We are stable but need to maintain our current faculty while expanding staff services to enhance the programs. The state funds are provided each year to CALS and are distributed to both the Department of Agricultural and Biosystems Engineering (ABE) and School of Plant Sciences (SPLS) for operations and faculty support of the CEAC and its interdisciplinary programs. The salary funds are available for the CEAC program.

A new educational and training greenhouse facility is being planned with support from the industry, to provide experienced growers for the future of the industry. It could operate as a full-time 3 ½ month class for 75 students per year, at $15k each for $1.1M per year; plus, the sale of tomato
product of 1M lbs. within 2.5 acre facility, providing $1M income from sales. Total yearly revenue is $2.1M; total construction cost is $5.5M; total operations cost is $500k per year [all estimates]. The business plan is in development. The expectation is for a semi-independent education/production facility, run as a business, and which makes a profit of benefit to CEAC. This educational facility is expected to become the singular and premier facility [and only one in the USA] and in North America, as well, with CEAC geographically located at the “center” of the North American greenhouse produce industry in Canada, USA and Mexico.
CEAC STRATEGIC GOAL #1: Enhance and communicate our standing as a world leader in CEA plant & biosystems production through Research, Education, Extension & Outreach (REEO)

A. Current situation and gap between current situation and desired situation

- Since 1998 (see note above), the CEAC is the only comprehensive educational program in the United States for CEA, with full complements of activity in Research, Education, Extension and Outreach (REEO).
- While Research, Extension, and Outreach increases, potential undergraduate and graduate students are not aware of CEAC for their education.
- CEAC activity must garner support from new capital sources to assure sufficiency to maintain current needs, and for new opportunities. CEAC Research is expanding LED lighting design and application; sensor systems knowledge and application of software-driven optical sensing systems; bioregeneration systems for greenhouse and space applications; flavor and plant biochemical enhancement; multi-crop of plant and seafood.
- All CEAC classes are “hands on” and require specialized facilities, limiting the numbers of students. Additional world-class facilities are needed to attract and serve more students. The annual CEAC ‘Greenhouse’ Extension courses, intensive training programs, one-day workshops, Outreach to schools and other groups, include a global potential student and participant population.
- A gap in support systems (e.g., financial, organizational, institutional, governmental) currently persists, potentially threatening the growth and viability of CEAC if left unchanged.
- Current Outreach programs in North America, include presentations on global video in broadcast, cable and web-sites and functioning demonstrations serve to attract students and support for CEAC.

B. Strategies

- Research: Regular evaluation of relevant CEAC activities to keep on track in meeting this Goal.
- Education: Increase communication access and visibility for students at all levels.
- Extension & Outreach: Establish new and enhance existing programs. Establish partnerships with media, institutions, NGOs.

C. Actions & Time Period in Fiscal Years

- Research: Evaluation of CEAC REEO programs and all relevant CEAC activities FY 12-21

- Education: Increase our visibility, understanding & recruitment for students at all levels by cultivating 2 + 2 programs with Arizona community colleges (FY 14-17); and, create & enhance availability of courses to agricultural business FY 12-21

- Extension: Create CEA Specialty Crops Support Program especially for small growers; Create the first North American CEA Education/Training Center (ETC-GH); and, Develop staff for program coordination and agriculture markets development (FY 12-14); Increase annual Short Course and intensive education offerings; Increase Fee-For-Service CEA design analysis and advisory services FY 12-21

- Outreach: Develop a National CEA Organization and align with similar international groups (FY 12-15); Create a certification program for CEA employees (FY 13-21); Create a cross-channel template for “products” of CEAC (foods, systems & services) (FY 14-21); Access opportunities to increase CEAC visibility and understanding for Stakeholders (FY 12-21); Establish partnerships which can maintain and extend CEAC
(FY 12-21): Make CEAC the global CEA clearing house on CEA issues, solutions, and certifications for business and industry  FY 13-21

D. Inputs needed to achieve the goal -- Funding, Planning & Execution

E. Objective Metrics that will be used to track progress towards attaining goal

- Usual academic metrics (publications, citations, etc.) for recognition in professional research community
- Growth of the CEA food production industry (value of products; “% locally grown” products; etc.
- Distribution, demographics and programs activities of students participating in the CEA programs
- Amount of financial resources that become available for support of the programs
CEAC STRATEGIC GOAL #2: Create applications of CEA for a game change in food production systems by 2021

A. Current situation and gap between current situation and desired situation

- North America has increased greenhouses for food production. The volume contribution is relative small but the economic value and application value is tremendous. However, there is limited public understanding of the use of CEA technology. Open field agriculture is better understood.

- UA-CEAC is a unique academic center in North America with focus on REEO, which has been successful in technology development for crop productivity and quality, but further emphasis is needed with regard to environmental impacts (i.e. resource conservation)

- There is an increasing demand in urban horticulture and alternative food production systems, but the capacity to serve all Stakeholders and to develop opportunities is limited by current UA-CEAC resources.

- There are worldwide demands to employ CEA to solve interconnecting issues of “feeding/nourishing the world”, “environmental impact”, “limitation of resources”, and “meeting market demands”.

B. Strategies to achieve goal

- Identify, plan and develop key interrelated REEO initiatives at CEAC. The initiatives will be changed or modified based on funding agencies missions and emphases. Examples include:
  - Urban food production REEO initiative (USDA); Plant factory REEO initiative (USDA; NSF-vertical farming project); and, Plant-animal or plant-fish co-culture system REEO initiative (USDA-WRAC, SARE, USAID); Green energy integrated CEA systems (NSF, DOE, SARE, USDA, USAID); and, SmartCEA (intelligent sensing and controls) initiative (NSF, SBIR, STIR, USDA, private sector)
  - CEA education, research and IT&K transfer initiative to “feed the future” (USAID); and, Public education and K-12 programs (LGH-OTM, NSF-FIRE-REESE grants)
  - Develop collaborations with expanding algae culture industry in Arizona

C. Actions & Time Period in Fiscal Years

Develop research/extension initiatives at CEAC

- Initiative development planning, action initiatives & create working groups FY 13-14
- Obtain seed capital for planning and development activities FY 13
- Development & planning for innovative funding in CEAC self-support FY 12-13

Enhance communications and collaborations for CEAC

- Communications system planning, design, implementation; Communication, aimed at an action-reflection approach for continuous improvement of REEO FY 13
- Develop seminar series and publication and other media programs FY 13

Organize program for use of existing CEA facilities to support entrepreneurs and small business

- Continue negotiations with relevant UA leadership and other Stakeholders FY 12
- Plan for Marketing and Implementation of Program FY 13-21

D. Inputs needed to achieve the goal

- Grants (seed and other) & other supports for activating strategic programs listed in B
• REEO & Communications Planning & Design
• Innovative financing through various opportunities including grants, fees-for-services programs, proprietary product development and sales, partnerships, certification programs, cooperation with international agri-businesses, etc.

E. **Objective metrics that will be used to track progress towards attaining goal**
   Number of projects and total dollar values funded relevant to this goal;
   Number and quality of entrepreneurs supported through the program;
   Number of seminars supported through the program;
   Number and quality of web contacts (website, social media, etc.);
   Number and quality of visitors to events; Number of students in classes and training programs.
CEAC STRATEGIC GOAL #3: Enhance CEA Innovation, Technology and Knowledge (IT&K) transfer

A. Current situation and gap between current situation and desired situation

- Rising costs of resources, shortages in skilled labor, market changes, and global competition challenge the US food and floriculture CEA industries. CEA complements field production agriculture in Arizona. Resource limitations will affect all production agriculture.
- CEAC Research has focused on improving CEA technology for crop productivity and quality, while additional emphasis is needed for innovation, technology development and transfer. There is a specific need for adaptive, innovative, resource conservation responsive CEA systems in arid, semi-arid, urban, and extreme climates.

B. Strategies to Achieve Goals

- Work with University of Arizona Research Corporation (UARC) and other agencies for the development of IT&K transfer.
- Translate research activities into state-of-art facilities, processes, and product development with IP protection and patents.
- Create and promote a support mechanism to work on innovative projects and technology transfer (i.e. legal, financial, technical, and promotional)

C. Actions & Time Period in Fiscal Years

- Effectively present the CEAC mission globally through effective, timely communications, with consistent messaging, professional imaging, & innovative result-oriented media and venues
  - FY 12-13
- Review CEAC REEO on IT&K transfer and conduct “needs” assessment with growers and private sector to develop targeted initiatives
  - FY 13-14
- Increase global team building for IT&K transfer projects
  - FY13-15
- Develop CEAC Global Business & Industry Advisory Board
  - FY 12-21
- Increase SBIRs (i.e. USDA AFRI, NSF, DOE, DOD, STEMs, Business Sources, Partnerships)
  - FY 13-21
- Establish effective CEAC model for tech transfer, IP and patent applications
  - FY12-13
- Establish effective CEAC model for entrepreneurial “fee-for-service” processes
  - FY12-13
- Utilize Graduate Interdisciplinary Programs (GIDP) CEA track
  - FY 13-21
- Transfer aquaculture and aquaponics program from ERL into the CEAC
  - FY 13+

D. Inputs needed to achieve the goal

- Global and diversified collaboration on strategic initiatives
- Participation of industrial and grower partners for development and investment
- Collaborative support of UA administration, ABE, SPS, UARC, and CEAC faculty and staff
- Enhanced REEO facilities, capabilities, and professional development opportunities
- Diversified funding with traditional and non-traditional sources to support faculty, staff and students
E. **Objective metrics that will be used to track progress towards attaining goal**
   - Total dollar values of grants obtained leading to IT&K and technology development
   - Number and effectiveness of partnerships established and leading to IT&K development and transfer
   - Number and impact of economic value (jobs, dollars, etc.) originating from IT&K development
   - Number and total revenue generated from IP and patents
   - Number of students, staff, and trainees, degree program students graduated, employed in industry, etc.
CEAC STRATEGIC GOAL #4: Become financially self-sustaining

A. Current situation and gap between current situation and desired situation
   • Since 2000, the $700,000 annual State funds have been reduced to $300,000 per year.
   • CEAC faculty win on average $500,000 yearly through traditional means (grants, etc.) to support R&D and educational projects. These funds cannot be used for the Center’s operational and maintenance costs. State funding reductions have begun to consume the ‘seed corn’ of the Center, and this will eliminate critical programs and projects and people who have become the backbone of CEAC.
   • CEAC personnel have goals and aspirations for the CEAC and for each of our own expanding professional careers. We expect greater coordination and teamwork across CALS and the UA through their departments of contracts, programs, finances, legal, graduate and undergraduate schools, etc.
   • CEAC requires improved financially sustainable practices to maintain and grow the Center to meet the worldwide demands of CEA.
   • The gap needs to be bridged for these capacity building functions.

B. Strategies to achieve goal
   A comprehensive review is required of the current CEAC REEO, design analysis services, communications, and business development activities of CEAC faculty, staff, students, supporters, benefactors, etc. It will require input from beyond the campus borders and will assure legal and ethical applications, while maintaining the Vision and Mission of the CEAC and its parent organizations (CALS, UA). With targeted stakeholders, internal leadership, faculty and staff, etc. we will evaluate potential financially supporting opportunities, including but not limited to:
     • Development of an advisory board of globally acknowledged external supporters to provide advice; ‘connections’; political support; annual funding sourcing.
     • Development funding opportunities for supporting innovative projects, exceptional students, unique faculty needs, travel capabilities, visiting scholars, and industry partnerships.
     • Developing alternative fund raising strategies in coordination with business development expertise resident in CALS, UA and the CEA community.

C. Actions & Time Period in Fiscal Years
   • Complement the Actions as outlines in the three CEAC Goals described above FY 13-21
   • Increase the CEAC yearly financial support for an anticipated ROI of 3:1. Return to the 2000 CEAC funding [$700k per year] for FY 12-13 with a decreasing yearly amount over the subsequent 10 years, to reach a minimum [current faculty/staff salary demands of ~$300k], allowing the opportunity for CEAC to establish permanent outside funding sources FY 13-22

D. Inputs needed to achieve the goal
   • Commitment of CALS and UA to work with CEAC to maintain the integrity of CEAC human capital, its facilities, and its national/international components, and especially the ‘spirit’ of the State Decision Package of 1998.
   • Changes to the CALS and UA fiscal policies with the goal to have both policy and leadership/staff being supportive of entrepreneurial activities.
   • Immediate CEAC Faculty and staff salary adjustments to remain competitive.
   • CEAC adjunct faculty and special supporters to be recognized.
   • Support in the form of staff employment, investment from industry, relationship with growers, and collaboration of UA faculty

E. Objective Metrics that will be used to track progress towards attaining goal
• Complement the Metrics as outlined in the three Goals described within this document
• Donations and support from CEAC graduates and private sector
Development and Alumni Affairs
DEVELOPMENT & ALUMNI AFFAIRS 2021 STRATEGIC PLAN

Revised August 13, 2013

Development & Alumni Affairs Purpose:

Our purpose is to generate maximum gift support for CALS based on the dean’s priorities through donor-driven fundraising.

Development & Alumni Affairs 2021 Vision:

We will engage alumni, friends, corporations, and private foundations to create passion for CALS people and programs resulting in philanthropic support.

Development & Alumni Affairs Mission:

Create opportunities for meaningful engagement of CALS alumni and friends that results in world-class students, faculty and facilities.

Development & Alumni Affairs Shared Values:

Internal values:

- Excellence
- Integrity
- Teamwork
- Strong work ethic
- Clear communication
- Customer service
- Productivity
- Fun

External values:

- Build trust with our prospects
- Earn respect
- Follow through on our commitments
- Treat all ethically
STRATEGIC GOAL ONE

Double gift revenue for CALS by 2021

F. Current situation and gap between current situation and desired situation:

- Gifts were $2.3 million in 2002 with one Development Officer (DO)
- CALS gift total average last three years = $8 million with 3 DO’s

-Gap: Development officers have other responsibilities which limit their focus
-Gap: Little support staff for development officers

G. Strategies to achieve goal:

1. Hire/retain the best paid/most productive development and alumni professionals
2. Increase the number of development professionals and add support people
3. Create a culture of faculty supporting development for their own areas
4. Focus on high capacity alumni prospects in Arizona and California/rest of U.S./and globally
5. Work to create new corporate partnerships for centers of excellence (agricultural/retail/biotech, etc.)
6. Continue to support a fully-funded, comprehensive Annual Giving program administered by the UAF.

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop a hiring plan for new people:</td>
<td>FY 2013</td>
</tr>
<tr>
<td>-Director of Development/Corporate Partnerships</td>
<td>2014/2015</td>
</tr>
<tr>
<td>-Development support specialist</td>
<td>2014/2015</td>
</tr>
<tr>
<td>-California DO</td>
<td>2014/2015</td>
</tr>
<tr>
<td>-National/International DO</td>
<td>2018</td>
</tr>
<tr>
<td>-Stewardship DO</td>
<td>2019</td>
</tr>
<tr>
<td>2. Support development of CALS branding/marketing materials/YouTube videos, etc.</td>
<td></td>
</tr>
<tr>
<td>3. Take CALS new branding/communications materials face-to-face with our out of state prospects</td>
<td></td>
</tr>
</tbody>
</table>

H. Inputs needed to achieve the goal (do not limit to financial inputs):

-UAF financial support for salaries and travel
-University development office/college salary support
-Commitment of dedicated time from faculty and Dean for development
-Research support to identify prospects

I. **Objective Metrics that will be used to track progress towards attaining goal:**

- 10%-20% increase each year
- 2021 gifts exceed $20+ million
STRATEGIC GOAL TWO:

Develop new strategies to engage a broader base of alumni starting with first year CALS students

A. Current situation and gap between current situation and desired situation:

There are limited opportunities for alumni to engage with CALS in an easily accessible way. Current opportunities include, but are not limited to:

- UAF Board membership (invitation only & board approval required)
- UA AA Board membership (invitation only & board approval required)
- CALS Alumni Council membership (invitation only & board approval required)
- Unit level advisory boards (i.e. SNRE, AREC, Norton, AGR House) (invitation required)
- Ambassador involvement (invite)
- Guest lecture (invite)
- Ag 100 membership (open)
- Burrito Breakfast (open)
- Compendium (open)

B. Strategies to achieve goal:

1. Update the CALS Alumni Council By-laws and structure to engage more alumni and empower members
2. Redirect CALS Alumni Council resources (time, talent & treasure) to create new events/methods that engage more students and significantly broaden our alumni support base
3. Work with faculty to instill a philanthropic mindset in our students for CALS from the first day of class
4. Establish a relationship with key faculty to connect alumni including developing a CALS Alumni “Speakers Bureau” with CALS Academic Services for classes and helping to involve key alumni prospects for the new faculty tour
5. Support the expansion of the Heritage & Traditions class to reach more students and alumni via on-line distance learning, homecoming, etc.
6. Involve alumni and their companies and networks in the creation of internships, student tours, networking events, etc.

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redirect alumni council with new purpose</td>
<td>FY’14/15</td>
</tr>
<tr>
<td>Collaborate with CAS and Student Affairs to reach current students through events</td>
<td>FY’13/14</td>
</tr>
<tr>
<td>Attend faculty staff meetings to facilitate new philanthropic mindsets</td>
<td>FY’13/14</td>
</tr>
<tr>
<td>Work closely with Alumni Council and Development to assist with alumni connections</td>
<td>FY’13/14</td>
</tr>
<tr>
<td>Create annual fall welcome event hosted by Alumni Council for new students</td>
<td>FY’13</td>
</tr>
</tbody>
</table>
6. Create annual spring senior send-off hosted by AC for graduating Seniors FY ’13
7. Expand the reach of Heritage & Tradition class to reach more alumni FY ’15

C. Inputs needed to achieve the goal (do not limit to financial inputs):

- Time of AC members to invest in new events
- Time of CAS staff to work with students and AC reps to coordinate events
- Time of development officers to identify, cultivate and solicit gifts for H&T Chair

D. Objective Metrics that will be used to track progress towards attaining goal:

Number of active alumni annually
Improvement in % of alumni who give back from 4.88%
Faculty/staff participation level compared to other UA academic units
STRATEGIC GOAL THREE:

**Capitalize on the aging alumni /friend population**

**A. Current situation and gap between current situation and desired situation:**

- For the past three years, estate gifts have accounted for 10% of CALS gifts annually ($2.36M total)
- Current number of CALS alumni 60 years+ is 6,050 (26% of total)
- In 2021, number of CALS alumni 60 years+ will be 11,419 (89% increase)
- Prospects age 60 years and older are prime prospects and often have reduced financial obligations

**B. Strategies to achieve goal:**

1. Target prospects age 50 to 70 years. Engage them with the college and educate them on giving opportunities to secure major gifts, including planned gifts.

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorporate planned giving into marketing &amp; communications for CALS</td>
<td>FY ‘14</td>
</tr>
<tr>
<td>Build target CALS list over 75</td>
<td>FY ‘14</td>
</tr>
<tr>
<td>DOs utilize and incorporate specific tools from UAF Gift Planning</td>
<td>FY ‘14</td>
</tr>
<tr>
<td>Presentations to educate &amp; identify likely prospects</td>
<td>FY ‘14</td>
</tr>
<tr>
<td>Do some mailing tests of some customized CALS brochures/mailings</td>
<td>FY ‘14</td>
</tr>
<tr>
<td>Outreach to women and families (as patriarchs die)</td>
<td>FY ‘15</td>
</tr>
<tr>
<td>Hire specific Planned Giving DO</td>
<td>FY ‘16</td>
</tr>
</tbody>
</table>

**C. Inputs needed to achieve goal:**

- Funds for prospect events and marketing communications
- Cooperation and time from UAF Office of Gift Planning
- Funds from UAF to split fund CALS Planned Giving DO

**D. Objective Metrics to track progress**

- Track increase in number of assigned prospects aged 60 and over
- Track number of planned giving proposals
Track number and value of committed planned gifts
STRATEGIC GOAL FOUR:

*Increase development officer productivity by 20-30%*

A. **Current situation and gap between current situation and desired situation:**

- Approx. 20% of DO time dedicated to reporting, administration and non-fundraising duties
- Allow DOs to dedicate 90-100% of time to major gift development

B. **Strategies to achieve goal:**

1. Work “smarter” to maximize results
2. Get additional administrative support to free up time for prospect visits, stewardship, etc.

**Actions**

All actions will be implemented in FY ’13/’14 and ongoing throughout:

1. Identify current DO tasks to delegate or disregard
2. Leverage existing friends/natural partners to increase success booking appointments & securing gifts
3. Delegate some administrative tasks to support personnel
4. More joint asks with other units
5. Identify and maximize use of available resources at UA Foundation (ex., GIFT Center, Donor Services, Scholarship administration, marketing communications, etc.)
6. More Administrative support
   a. Scholarship stewardship research and management
   b. Assemble info & materials for prospect visits
   c. Help identifying and booking “cold call” appointments
   d. Travel arrangements and reservations
   e. Actively assist with website updates, newsletter writing & production and constituent meeting planning.
7. Maximize current technology to be more productive

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8. **Inputs needed to achieve goal:**

Ongoing DO professional development
Funding for I-Pad video and other presentation tools
Additional administrative support staff

9. **Objective Metrics to track progress:**

Compare UAF productivity metrics (number of personal visits, proposals, etc.) and dollars raised to prior years
Entomology
ENTOMOLOGY 2021 STRATEGIC PLAN
May 18, 2012 revised October 19, 2012

Purpose
Improve the quality of life of the people of Arizona and the world by generating, disseminating, and applying information about insects

2021 Vision (each component below is reflected in a specific strategic goal)

1. The quality and impact of our research will be recognized in Arizona, nationally & globally.
2. Our IPM programs will be implemented in Arizona and other arid regions worldwide and will boost the economy, protect the environment, and promote better health.
3. The graduate program in Entomology & Insect Science (EIS) will attract the best students; students completing EIS degrees will be in high demand from employers.
4. Our outreach programs will educate, delight, and connect community members with Entomology, CALS, and the University of Arizona.
5. The UA Insect Collection will be the best source of specimens from the Sonoran Desert Region and a global center for specimen-based insect research.
6. Our programs will be well-supported by private donors, as well as by governmental agencies.

Mission
• Conduct outstanding research to better understand insects and their impact on humanity
• Provide distinguished education in insect biology
• Develop and deploy the most advanced technologies and progressive IPM programs in the world to minimize the negative impacts of insects and maximize their benefits
• Provide outstanding outreach programs about insects accessible to all community members

Shared Values
• Respect for all people
• Collaboration among department members
• Collaboration within & across disciplines with others in CALS, UA, and other institutions
• Knowledge is power
• Serve our profession and the people of Arizona and the world
• Excellence in all pursuits
• Passion for achieving positive outcomes
• Work hard and have fun doing what we love to do
• Provide value for resources invested in Entomology
• Develop programs with local and global relevance
• Take advantage of our desert environment & position in the front line of climate change
2. RESEARCH STRATEGIC GOAL: Increase Entomology research productivity 50% by 2021.

A. Current situation and gap between current and desired situation
Outstanding, cutting-edge research is our hallmark and the core strength that underlies excellence in our instruction, extension and outreach. We aim to capitalize on this core strength to increase Entomology research productivity 50% by 2021. Our internationally recognized research must rise to meet the challenges of climate change and a rapidly increasing human population. These challenges demand innovative interdisciplinary research to lead the way in combating crop pests, biomedical pests, invasive species, and the decline in biodiversity.

B. Strategies to achieve goal
- Target critical global issues with research led by our faculty and their collaborators
- Retain current faculty who have outstanding research productivity
- Recruit new faculty with outstanding research productivity
- Increase research productivity of current faculty
- Enhance collaborations in the Dept. and with others (UA, national, and international)
- Strengthen research infrastructure including support staff and facilities

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-21</td>
<td>Create and lead interdisciplinary teams to address global challenges</td>
</tr>
<tr>
<td>2013-21</td>
<td>Reward faculty achievement with merit raises and promotions</td>
</tr>
<tr>
<td>2013-21</td>
<td>Nominate faculty for awards to recognize their outstanding achievements</td>
</tr>
<tr>
<td>2013-21</td>
<td>Enhance mentoring of faculty by head and outstanding peers</td>
</tr>
<tr>
<td>2013-21</td>
<td>Encourage and reward productive team efforts</td>
</tr>
<tr>
<td>2014-21</td>
<td>Recruit faculty in areas with strong extramural funding prospects: mitigating effects of climate change on biodiversity, pollinators, &amp; food security; invasive species; insect genomics and bioinformatics; and insects of biomedical importance.</td>
</tr>
<tr>
<td>2013-15</td>
<td>Increase efficiency of grant submissions</td>
</tr>
<tr>
<td>2013-21</td>
<td>Obtain more funding from international sources</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Research support staff: 12 FTE, $420K salary per year + ERE**
- 6 tenure-track faculty lines (0.80 FTE research, 0.20 teaching): $480K salary per year + ERE; startup of $1.8M
- Staff to support and streamline grant submissions: 1 FTE, $35K salary per year plus ERE
- Four additional lab modules in Marley for Entomology
- Repair or replace shared research equipment (e.g., autoclaves): $15K per year

E. Objective metrics that will be used to track progress towards attaining goal
- Extramural research funding per faculty research FTE per year
- Publications listed in Web of Science per faculty research FTE per year
- Citations per departmental publication in Web of Science
- Faculty honors and awards
Note: We expect 4-6 current tenure-track faculty will leave the department by 2021. Thus, filling the 6 requested faculty lines would maintain or slightly increase the number of tenure-track faculty.

**amendment approved by faculty October 19, 2012**
3. IPM STRATEGIC GOAL: By FY19, greatly enhance effectiveness of Integrated Pest Management (IPM) research, education, and Extension programs in Arizona for teaching students and stakeholders, and for solving economic, environmental, and health problems caused by pests.

A. Current situation:

- Cooperative Extension and research programs in IPM have garnered national and international recognition for their development and deployment of new strategies with large impacts on the economy, environmental protection, & society (e.g., > $500 million saved since 1996 in Arizona alone).
- Key IPM faculty have left (Watson, Kerns, Dennehy, Byrne) and others will leave in the next 10 years.
- An internationally recognized graduate IDP in Entomology & Insect Science, but we currently provide education to a very limited number of IPM scientists.
- Capacity to create a premier U.S. center for IPM research, education, and Extension is incomplete, but would attract major funding, the best scientists, science, and students of IPM, and would generate solutions to society’s pressing needs for safe and secure food and fiber, and healthy environments.

Desired situation:

- A world-class student-centered graduate and undergraduate IPM educational program (IDP) that capitalizes on the high profile research and Extension programs currently in place.
- An interdisciplinary synergistic approach that enables a fully collaborative environment across unit boundaries and enhances our effectiveness at winning major grants and having major impacts.
- Establish the UA as a premier center for IPM research, education, and Extension that impacts the future of the science and its application and implementation, and supplies the workforce needed to educate a generation of students that will face daunting food security, safety, and environmental challenges posed by pests and pest-related risks.

Gap:

- New IPM teaching personnel are needed to develop the interdisciplinary curriculum that provides the third leg of our integrated research, education, and Extension IPM center.
- Cooperative structures needed to foster team development across unit boundaries.
- New IPM research and Extension personnel to fuel innovation in science and implementation.

B. Strategies to achieve goal

- Recruit faculty, other appointed personnel & classified staff needed in IPM
- Create a fertile environment for the development of translational sciences needed to support IPM
- Leverage resources from gifts/grants/contracts to support staffing needs (50% share of each)
- Partner with allied departments and units with similar interests to develop an IPM curriculum and to forge strong interdisciplinary relationships in research and Extension (Entomology (lead), Agricultural & Biosystems Engineering, Agricultural & Resource Economics, School of Natural Resources & the Environment, Plant Sciences, Soil, Water, and Environmental Science, Agricultural Centers (MAC, YAC, SAC, CAC), County and statewide Tribal Cooperative Extension Offices)
- Develop courses (IPM, Biocontrol, Advanced Topics in IPM, structural IPM, Medical & Veterinary IPM)
- Establish new Extension IPM programs to meet stakeholder needs (e.g., Greenhouse, Small Farms, Urban IPM)
- Establish stable funding for graduate student Extension assistantships & undergraduate research & Extension internships
C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Hire IPM faculty (80% research: 20% teaching) &amp; 1 research specialist</td>
</tr>
<tr>
<td>2014</td>
<td>Offer 400/500 level IPM course (e.g., Integrated Pest Management)</td>
</tr>
<tr>
<td>2014</td>
<td>Hire IPM faculty (80% research: 20% teaching) &amp; 1 research specialist</td>
</tr>
<tr>
<td>2014</td>
<td>Establish two IPM RA/TAships</td>
</tr>
<tr>
<td>2014</td>
<td>Offer 400/500 level IPM course (e.g., Biological Control)</td>
</tr>
<tr>
<td>2015</td>
<td>Hire IPM faculty (80% Extension: 20% research) &amp; 0.5 Extension educator</td>
</tr>
<tr>
<td>2015</td>
<td>Establish two IPM Extension Assistantships</td>
</tr>
<tr>
<td>2015</td>
<td>Offer 400/500 IPM course (e.g., Advanced Topics in IPM)</td>
</tr>
<tr>
<td>2016</td>
<td>Hire IPM faculty (80% Extension: 20% research) &amp; 0.5 Extension educator</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal

- Research/teaching faculty in IPM (2; $166K/yr)
- Classified staff (2 @ 3 years each; $390K total)
- Graduate assistantships (2 RA/TAs; $50K/yr)
- Cross unit agreements to mentor students
- Extension/research faculty in IPM (2; $166K/yr)
- Extension educators (appointed, 2 @ 0.5; $64K/yr)
- Extension assistantships (2 Ext. Asst.; $50K/yr)
- Undergrad summer internships (2@.5; $4K/yr)
- One-time startup cost for 4 IPM faculty $500K
E. Objective metrics that will be used to track progress towards attaining goal

Number of IPM undergraduate and graduate students recruited to & graduated from IDP programs
Number and amounts of grants awarded to IPM faculty
Number and % of IPM graduates placed in career-track positions (near 100%)
Number of professional continuing education units offered (CEUs) and delivered (No. of participants)
Economic and social impacts of our IPM programs ($ saved, pesticides reduced in the environment, etc.)
Increased security and safety of food and fiber supply produced in Arizona
Number of peer-reviewed publications created each year
Number of awards and honors received by IPM faculty
Interest in and extramural support for fellowships, internships, assistantships, and endowments

Notes
The investment in human capital is a ca. $500K per year with one time costs of another $390K in staff support.
Leveraged returns on this investment will easily be 3-fold & costs mostly offset by IDC returns to University
[average annual grants (realistic, initially): $250K/yr/faculty or $1M/yr; average IDC rate %30 or $300K/yr; (ideally and over time) $3M/yr total with ca. $1M/yr in IDC].
• Federal re-organization of IPM funding under a consolidated “Crop Protection” line of the USDA will increase visibility and funding for this vital program, and increase and standardize IDC to 30% equivalent to an effective rate of 42.65% of TDC (from previous 0–22% depending on sub-program).
• USDA’s National Institute for Food and Agriculture (NIFA) has created the Agriculture and Food Research Initiative (AFRI) competitive grants program that now rewards large, collaborative, team-based, and integrated (research, education, Extension) projects. Many awards are in the millions of dollars and at least 30% of funds from this program will be allocated to the Extension components. IPM, as a practical science that can fully articulate with Extension implementation programs, will have many new opportunities for funding through this program. A premiere IPM center for research, education, and Extension at UA would be ideally positioned to capture major resources from this program. Current IDC cap at 30% for this program, but many believe that future authorizations of this program will increase this cap in the future.
3. GRADUATE PROGRAM STRATEGIC GOAL: Double the stable funding for Entomology & Insect Science (EIS) graduate students by FY21.

A. Current situation and gap between current situation and desired situation

The Graduate Interdisciplinary Program in Entomology & Insect Science (EIS) is nationally recognized as excellent and attracts outstanding students. In the past 10 years, 94% of students completing MS or PhD degrees in our graduate programs (EIS and its previously separate parent programs Entomology and Insect Science) obtained positions related to their graduate training. Enrollment in EIS will increase 25% to 32 students in AY12-13. Yet, funding for students is unpredictable, which threatens future recruiting and the long-term success of the program. Although faculty grants support some students, the largest single funding source now is via TAs for undergrad courses that we do not control (i.e., Introductory Biology courses in the College of Science). We are grateful for CALS support for GAs, but this has declined in the last few years from about 3 to 1 GA per year. To attain the desired situation of a standing enrollment of 35 or more fully funded EIS students, we aim to double funding from stable sources.

B. Strategies to achieve goal

- Obtain NSF Integrative Graduate Education & Research Training (IGERT) grants
- Increase support of RAs via increased faculty research grants (see Research Goal)
- Develop endowments for GAs
- Improve online interface with potential students and the general public
- Increase funding from UA & CALS for TAs for undergrad courses taught by Entomology faculty

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revise and resubmit two recent IGERT preproposals that were not funded</td>
<td>2013-15</td>
</tr>
<tr>
<td>Submit new IGERT proposals</td>
<td></td>
</tr>
<tr>
<td>Develop donor base and obtain donations for supporting students</td>
<td>2013-21</td>
</tr>
<tr>
<td>Enhance Entomology &amp; EIS web sites</td>
<td></td>
</tr>
<tr>
<td>Create Facebook sites</td>
<td>2013-15</td>
</tr>
<tr>
<td>Develop and implement revenue-generating insect identification app</td>
<td>2013-17</td>
</tr>
<tr>
<td>Work with College of Science and VPR's office to make TAs in Intro. Bio.</td>
<td>2013-14</td>
</tr>
<tr>
<td>Seek CALS/UA support for TAs for two new undergraduate courses</td>
<td>2013-14</td>
</tr>
<tr>
<td>Seek CALS/UA support to increase funding to 0.50 FTE for TAs for 3 current ...</td>
<td>2013-15</td>
</tr>
<tr>
<td>develop by Ento faculty: Secrets of Success (Tier 1 NATS) and Agroecology</td>
<td></td>
</tr>
<tr>
<td>Seek CALS/UA support for TAs for two new undergraduate courses</td>
<td>2013-14</td>
</tr>
<tr>
<td>Seek CALS/UA support to increase funding to 0.50 FTE for TAs for 3 current ...</td>
<td>2013-15</td>
</tr>
</tbody>
</table>
D. Inputs needed to achieve the goal

- Faculty effort in IGERT proposal development and running funded IGERT programs
- Faculty effort in increasing extramural grant funding with support for RAs
- Faculty effort in recruiting and mentoring EIS students
- Efforts of department members and Advisory Board to develop donor base for student endowments: Attractive brochures, displays for Insect Festival, and web sites. Charitable black tie event for student endowment and other insect-related activities.
- Faculty teaching effort in large undergraduate courses
- CALS/UA increase in funding per year for GAs from current $27K to $66K
- CALS/UA support of TAs for 4 large undergrad courses, $60K per year.

E. Objective metrics that will be used to track progress towards attaining goal

- Funding of EIS students from IGERT grants, faculty research grants, and endowments
- Fully funded EIS students (total number and %)
- EIS degrees granted per year
- EIS students enrolled per year
- Papers published by EIS students
- Presentations by EIS students at scientific meetings
- Awards won by EIS students
- Job placement of EIS graduates

Notes

- Core and joint Entomology faculty are the major advisors for nearly all EIS students.
- Our EIS program goal aligns with the VPR's goal of increasing UA graduate student enrollment.
4. OUTREACH STRATEGIC GOAL: Double the number of people we reach each year through sustainable outreach programs to better connect the community with Entomology & CALS, to meet public demand for insect information, and to support K-12 science education.

A. Current situation and gap between current situation and desired situation

We deliver outreach via 3 main programs: Insect Discovery, the Arizona Insect Festival, and the UA Insect Collection (UAIC). Insect Discovery serves ca. 2000 K-8 students yearly and teaches ca. 25 UA undergraduate and graduate students how to communicate science to the public. The first Arizona Insect Festival (2011) delighted 2000 visitors and received great local press. In the past year, associates of the UAIC delivered 25 presentations on insects to community groups and responded to 3000 insect identification inquiries from the public. Despite the success of our current outreach programs, an enormous community demand remains for information about insects and for insect-related science enrichment for K-12 education. Moreover, these programs are supported largely by temporary extramural funding. To solve the problem of unstable funding and to capitalize on the opportunity to connect better with the community, we aim to obtain long-term funding and double the number of people served by Entomology outreach programs.

B. Strategies to achieve goal

- Provide opportunities for graduate students to increase expertise in outreach through paid positions, courses, and seminars
- Enhance communication statewide among all UA insect-related outreach activities
- Establish endowments for Insect Discovery and the Insect Festival
- Train K-12 teachers how to use insects to teach science
- Develop online insect outreach materials to reach beyond the local community

C. Actions | Time Period (Fiscal Years)
--- | ---
- Contact UA faculty statewide to coordinate insect-related outreach programs | 2012-13
- Catalog K-12 insect outreach resources online including links to programs | 2012-13
- Recruit more undergraduate students to Insect Discovery preceptor course | 2012-15
- Invite community members and vendors to participate in Insect Festival | 2012-15
- Enhance UAIC and Insect Discovery websites | 2012-13
- Provide teacher training in insect collecting methods (NSF Collections grant) | 2013-14
- Develop a graduate course in communicating science and public outreach | 2013-15

D. Inputs needed to achieve the goal

- Funding for 2 new semesters of Outreach TAships per year (0.5 FTE) - $32K per year
- Increased undergraduate volunteer involvement for course credit
- Faculty, student, and staff participation in annual Insect Festival
- Financial support for Insect Festival - $10K per year until endowment is established

E. Objective metrics that will be used to track progress towards attaining goals

- Number of people served by Insect Discovery, Insect Festival, and UAIC
- Number and amounts of funded grants supporting outreach
- Number and amounts of donations supporting insect outreach
- Number of insect-related K-12 programs statewide included in online outreach catalog
- Number of new collaborations among insect outreach programs
- Impact of Insect Discovery and other insect outreach programs on K-12 student learning
5. INSECT COLLECTION STRATEGIC GOAL: Make the University of Arizona’s Insect Collection the world’s best source of arthropod specimens from the Sonoran Desert Region and a global center for insect research

A. Current situation and gap between current situation and desired situation
The 2 million specimens of the University of Arizona Insect Collection (UAIC) are a unique treasure for research, extension, education and outreach focusing on biodiversity of the Sonoran Desert Region. However, major investments are needed to modernize the UAIC and fully realize its benefits. To achieve the desired situation, we will: a) move the entire collection into modern facilities, b) increase space allotted to UAIC, c) improve visiting researcher facilities, and d) initiate a funded visiting researcher program. A renovated, digitized UAIC will enhance our competitive position for extramural funding by improving our capacity to conduct research on pest management, invasive species, and effects of climate change; and it will position the Department as a global center for specimen-based insect research.

B. Strategies to achieve goal
- Secure collection in modern cabinets and drawers to protect them from damaging beetles.
- Install a mobile system to allow for compactorizing cabinets to maximize space.
- Integrate orphaned collections into the main collection, following updated taxonomy.
- Renovate and unclutter the collection space to increase space for research.
- Capture specimen-level data, including georeferences, and provide this information online.
- Create a Virtual Network (interactive, web-based) with other collections in the Southwestern US.
- Advertise annual competition for Visiting Arthropod Systematist.
- Organize a UAIC board of advisors to help guide these transitions, connect with the larger community of systematists, and select annual Visiting Arthropod Systematists from applications.
- Connect UA students, faculty, staff with the local community of retired systematists and active amateur entomologists – sponsor biennial entomology meetings (first one is planned for June 2012).
- Connect with the community of professional systematists that visit SE Arizona to collect arthropods from the Sonoran Desert Region.

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop UAIC website and UAIC logo</td>
<td>............................2012</td>
</tr>
<tr>
<td>Apply for NSF Collections Improvement and NSF Digitization funding</td>
<td>............................2011-12</td>
</tr>
<tr>
<td>Form UAIC Advisory Board</td>
<td>............................2012</td>
</tr>
<tr>
<td>Establish Visiting Arthropod Systematist endowment</td>
<td>............................2011-12</td>
</tr>
<tr>
<td>Develop application guidelines, advertise, and select first Visiting Systematist</td>
<td>............................2012-13</td>
</tr>
<tr>
<td>Digitization: hire undergrads to capture data and develop database</td>
<td>............................2012-15</td>
</tr>
<tr>
<td>Install compactors and move specimens into new cabinets</td>
<td>............................2012-14</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Schlinger Foundation Endowment for Visiting Arthropod Systematist ($625K, obtained)
- NSF-CSBR infrastructure grant ($468K, approved for funding)
- NSF-ADBC digitization grant ($333K, obtained)
- CALS matching support for NSF grants ($40K, funds committed for physical renovation)
• Permanent room in basement of Forbes to house the UAIC Alcohol and Frozen Tissue Collections (CALS, space committed). Two -80 freezers (BIO5, resource committed)
• Temporary staging area in basement of Forbes while we prepare for renovations (CALS, space committed).
• Acquire Forbes room 402 for expansion of collection (Entomology, space committed).
• Space in Forbes for 10 undergraduates to work digitizing the collection
• Server space and 0.25 FTE IT support ($12K per year) for specimen-level database.
• 0.5 FTE RA for collection support ($20K per year). Hiring graduate students will allow us to train the next generation of biological research collection guardians and provide them with experience for expressing the importance of such efforts to the public.
• Senior Program Coordinator, 1.0 FTE, $50K + ERE per year, 0.5 FTE funded now by NSF. The UAIC curator (W. Moore) is a tenure-track Assistant Professor position with 0.20 FTE time for curation. She will need support to manage these labor- and management-intensive NSF projects so she can focus on her research and teaching.
• Long-term support for Associate Curator, 1.0 FTE (position now held by Carl Olson).

E. Objective metrics that will be used to track progress towards attaining goal
• Progress of renovation relative to timeline provided in NSF proposal.
• Number of visitors and specimen loans
• Damage caused by dermestid beetles.
• Number of specimen records published online.
• Assess level of curation of collection using standard method (McGinley system)
• Use of collection for local entomology meetings, sorting events by students, and outreach
• Number of research articles published using the UAIC
• Amount of extramural resources obtained for collection improvement
• Amount of extramural resources secured and used for Visiting Systematists, fellowships, endowments, etc.
• Number and scope of inter-institutional, regional, national, and international requests of UAIC and collaborations formed.
6. DEVELOPMENT GOAL: Raise $2 million from private donors to support our programs by FY21.

A. Current situation and gap between current situation and desired situation
The Department of Entomology fulfills UA’s Land Grant mission by offering economically important research, extension and outreach to our state’s stakeholders in agriculture, urban pest management, biodiversity conservation, and education. We are unique in UA and CALS because we focus on insects, which generate tremendous public interest. However, we receive little direct financial support from the public. We will connect with the community in new ways to increase stakeholders' financial support of Entomology & CALS.

B. Strategies to achieve goal
- Increase visibility to stakeholders and all citizens of the state & region
- Connect with the community through events such as the Arizona Insect Festival, programs such as Insect Discovery, and resources such as the UA Insect Collection (UAIC).
- Maintain and enhance our high Department profile in local and national news.

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>C. Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-21</td>
<td>Work with the CALS Development Office to seek funding for our programs (Insect Discovery, EIS grad program, UAIC, Insect Festival, etc.).</td>
</tr>
<tr>
<td>2014</td>
<td>Hire a part-time Development Coordinator to work with the Department &amp; CALS to organize support-raising events and to increase the profile of the Department.</td>
</tr>
<tr>
<td>2012-13</td>
<td>Establish an Advisory Board to connect with the community and be our advocates in diverse circles within the State (medicine, agriculture, pest management, etc.).</td>
</tr>
<tr>
<td>2012-13</td>
<td>Renovate the Entomology classroom (Forbes 412) and main business office (Forbes 410) to project a more modern image to visitors.</td>
</tr>
<tr>
<td>2013-15</td>
<td>Work with CALS to build appealing exhibits in the main lobby of Forbes, in the Student Union, and elsewhere on campus that would highlight the accomplishments and activities of the Department and other CALS Departments.</td>
</tr>
<tr>
<td>2013-15</td>
<td>Enhance the department website with development goals and ways for stakeholders to become involved with departmental activities.</td>
</tr>
<tr>
<td>2013-21</td>
<td>Hold regularly scheduled support-raising events such as the Insect Festival, insect-themed social events, and high-end events with invited supporters and potential new supporters.</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Effort by faculty and other Department members to support development
- Effort by Entomology Advisory Board
- Part-time Entomology Development Coordinator who will increase our profile, organize fund-raising events, and garner new resources: $30K per year
- Collaboration from CALS Development Office
- Funds for physical renovations, exhibit development, and IT support: $15K per year

E. Objective metrics that will be used to track progress towards attaining goal
- Funds raised per year
International Programs
CALS OFFICE OF INTERNATIONAL PROGRAMS 2021 STRATEGIC PLAN

CALS OFFICE OF INTERNATIONAL PROGRAMS Purpose: To elevate the role of The University of Arizona CALS into the top ranks of International Ag Programs.

CALS OFFICE OF INTERNATIONAL PROGRAMS 2021 Vision: To be recognized as the top international institution for arid and semi-arid agriculture and natural resource research and management.

CALS OFFICE OF INTERNATIONAL PROGRAMS Mission: To build the reputation of CALS through education, research and extension globally. To encourage engagement across the entire faculty, staff, student body and visiting scientists.

CALS OFFICE OF INTERNATIONAL PROGRAMS Shared Values: We believe that the entire campus and Arizona community benefit through greater engagement with international ag and natural resource experts.
STRATEGIC GOAL ONE: To raise the profile of UA-CALS as a pre-eminent international agriculture and natural resource program

A. **Current situation** (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

CALS has a strong reputation as a leader in arid lands agriculture and natural resource management, but is not so well known outside that particular niche. We expect to increase our recognition amongst our Ag and Life Science colleagues and the international community.

B. **Strategy/ies to achieve goal** (list if more than one)

1. Develop a named international center for ag and natural resource science (Center for Strategic Agriculture for example)
2. Continue to win grants for Borlaug, Cochrane, Fulbright Fellows and Farmer to Farmer programs.
3. Develop and distribute regionally focused newsletters to international UA community (alumni, partners, past visiting research fellows and scientists).
4. Represent UA –CALS at international fora, provide guest lectures, invite international guests to Arizona, encourage other faculty to consider international grant programs and CGIAR’s as locations for sabbaticals.
5. Gain additional private sector support with international agribusinesses.

C. **Actions**

1. Continue to work with Development Office, international donors, and faculty to develop funds for a Center. (Short to medium term – 2012-2020)
2. Continue submitting grant proposals and assisting faculty who submit themselves (Short to medium term – 2012-2020)
3. Write the newsletters and encourage submissions from faculty (Short to medium term – 2012-2016)
4. Provide guest lectures and represent UA-CALS at international meetings. Encourage and assist faculty to travel, gain grants, Fulbrights and Fellowships. (Short to medium term – 2012-2018)
5. Collaborate with more international agribusinesses (examples: CP Foods, (Thailand), Konya Seker (Turkey), Sim Darby (Malaysia), greenhouses in Mexico.

D. **Inputs needed to achieve the goal** (do not limit to financial inputs)

1. Time and administrative support.
2. Funds from private and govt. sources

E. **Objective metrics that will be used to track progress towards attaining goal**

1. Funds raised towards a Center.
2. Number of grants and amount of funding awarded to CALS.
3. Number of newsletter distributed
4. Number of international presentations, Fellowships, travel grants, and awards for CALS faculty.
5. Number of grants and agreements with international agribusinesses.

Notes (if any)
STRATEGIC GOAL TWO: Have UA-CALS be a leading source of Peace Corps Volunteers

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

UA is one of the leading sources of Peace Corps volunteers nationally. Two key areas of scarce skills for Peace Corps are Agricultural and Environmental. Our goal will be to further increase the number of students who enter the Peace Corps.

B. Strategy/ies to achieve goal (list if more than one)

We will increase the profile of Peace Corps as a potential career opportunity upon graduation. Specifically we will increase the number of presentations we make to undergraduate classes and student organizations within CALS.

C. Actions

1. Make appointments with CALS faculty for 20 minutes of time once a semester for Peace Corps recruiter to speak the class regarding Peace Corps as a career opportunity (Short to medium term – 2012-2018)
2. Make appointments with SWES, Fisheries, Wildlife Clubs, Soil Judging team, Rodeo Team, CALS Ambassadors, etc. to meet with Peace Corps recruiter. (Short to medium term – 2012-2018)

D. Inputs needed to achieve the goal (do not limit to financial inputs)

Agreements with class instructors and club advisors.

E. Objective Metrics that will be used to track progress towards attaining goal

Numbers of students from CALS who apply, receive nominations, and eventually join the Peace Corps.

Notes (if any)
Natural Resources and the Environment
Phase III – CALS Unit Strategic Planning

SCHOOL OF NATURAL RESOURCES AND THE ENVIRONMENT (SNRE): 2021 STRATEGIC PLAN

SNRE Purpose: To create the knowledge and the scientific workforce needed to deliver our natural resource base to the next generation in a better condition than it is today.

SNRE 2021 Vision: SNRE is the University of Arizona’s center-of-excellence for research, higher education and training, and extension and outreach for the conservation and management of natural resources and in the advancement of knowledge in public policy, planning, and human dimensions of natural resource management. SNRE is dedicated to improving our understanding and the sustainable use of natural systems and watersheds, wildlife and aquatic organisms, forests, and rangelands with a focus on arid and semi-arid lands.

SNRE Mission: The mission of the School of Natural Resources and the Environment is to provide innovative and interdisciplinary research and applications that lead to sustainable management of the natural resources of Arizona, the West, and the Nation, and to educate existing practitioners and the next generation of resource managers, scientists and policy makers who will take on the challenge in an ever-changing world.

SNRE Shared Values: SNRE values conservation of the integrity and biodiversity of the ecosystems that make Arizona unique, while supporting the livelihoods of rural and urban Arizona.
STRATEGIC GOAL ONE: Maintain Domain Expertise

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

Imminent retirements threaten our ability to provide training for the next generation of professional natural resource managers.

B. Strategy/ies to achieve goal (list if more than one)

One of our basic operating assumptions is that we will not be able to replace most faculty who retire. This will require that we maximize flexibility in how we can continue to provide critical instruction for our students. This will involve:

1. De-couple course responsibility from individual faculty members, to the degree this is possible to enhance flexibility to allow:
   a. Team teaching using existing faculty
   b. Recruitment of uniquely-qualified lecturers from the community
2. Make a case for replacement of faculty who are uniquely critical to our mission.

C. Actions

First, we will identify specific needs that must be met to maintain our ability to train professionals who can be certified by professional societies in natural resources. Second, we will inventory the skills of our faculty and match them to our instructional needs. This will allow us to assemble a teaching team to offer the most critical courses. Third, we will identify professionals in Tucson (retired and active) who might be recruited to (a) offer entire courses, or (b) fill identified gaps in what our in-house teams might be able to provide.

D. Inputs needed to achieve the goal (do not limit to financial inputs)

An internal and external inventory of internal professional expertise coupled with a matrix of instructional requirements and development of a business plan to support payment to local professionals when necessary.

E. Objective Metrics that will be used to track progress towards attaining goal

Progress and success will be measured by the continued accreditation of our programs and the ability of our students to meet professional certification.

Notes (if any)
STRATEGIC GOAL TWO: Strengthen and Diversify Revenue Streams

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

It is certain that state support will continue to decline. In the face of this decline, we must develop other revenue streams that are available to us. First, while SNRE has the largest graduate program in CALS, both our undergraduate program and our student credit hour production are modest. Second, we have very strong relationships with Federal and State land management agencies and conservation organizations. Research opportunities will be enhanced with the siting of the new Department of Interior Climate Science Center within SNRE. Third, our relationship with management and conservation agencies and our international prominence as a center for arid/semiarid land management offers unmatched opportunities for training career professionals. Pursuit of all three opportunities should enhance our funding situation.

B. Strategy/ies to achieve goal (list if more than one)

1. Increase student credit hours and number of undergraduates in our Natural Resources major
2. Increase revenues from sponsored research
3. Re-invigorate professional training programs offered by School faculty and personnel

C. Actions

Time Period (Fiscal Years)
2013-2016

Overall: We will establish an incentive system that will reward faculty members who contribute to each of the goals listed above (i.e., return some portion of the revenues generated through RCM, IDC, or professional training to actively involved faculty within the first year.

B.1. We will: (1) enhance our website to be more attractive and informative for prospective undergraduates (one year); (2) offer 2 more undergraduate (Tiers 1 and 2) classes to attract new majors (two years); (3) create Transfer Pathways (“2+2 programs”) to enhance movement of students from Arizona community colleges into the College and the Natural Resources major (1 year); and (4) actively participate in undergraduate orientation, job fair, and homecoming to enhance our visibility (two years).

B.2. The CSC will offer many new research opportunities with DOI agencies. We will actively pursue these with our partners (2 years).

B.3. We are assembling a survey of our state, Federal, and international partners to determine what types of professional training courses would be attractive. We expect to offer these within the next two years.

D. Inputs needed to achieve the goal (do not limit to financial inputs)

We are in the process of identifying our training needs (see B.3). We have space that we intend to modify for training that would include tables, chairs, and computers. We expect we will need $30K to transform this space. We have several relatively new faculty who will be asked to focus more on generation of research funding, while other faculty will take on greater instruction and training duties.

E. Objective metrics that will be used to track progress towards attaining goal

- Increased enrollments at the undergraduate (15%) and graduate (10%) levels
- Increased student credit–hour production (20%)
- Increased number of courses offered online (8 [currently 2])
- Increased value of research contracts and grants (20%)
- Increased annual revenue realized through professional training courses ($40,000)
STRATEGIC GOAL THREE: Strengthen Relationships with Constituents

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

SNRE had an advisory board that was disbanded 4 years ago. There is a very real need to reconnect with (1) the land managers (public and private) whom we serve for technical advice, (2) potential donors who might be willing to support the School, and (3) alumni, especially those willing to support our mission.

B. Strategy/ies to achieve goal (list if more than one)

1. Reestablish an advisory board with members from (a) private land managers from Arizona, (2) Federal and state agencies we serve, and (3) non-governmental agencies.
2. Create a new development board that can work with developing support from private donors.
3. Create an alumni group for support of 1 and 2 above, and create a support system for our graduates.

C. Actions

Do items B.1., B.2, and B.3 above within the next two years.

D. Inputs needed to achieve the goal (do not limit to financial inputs)

The time, effort and commitment of SNRE Director, Associate Directors and Faculty.

E. Objective Metrics that will be used to track progress towards attaining goal

As above.
STRATEGIC GOAL FOUR: Enhancing Pre-Professional Experience and Employability of Students

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

Many undergraduate students in SNRE participate in internships, independent study projects, and other pre-professional experiences, but we are not taking full advantage of opportunities for pre-professional experiences created by faculty research projects and our strong ties to management agencies. Also, no senior-level course in SNRE successfully serves as a capstone experience. A stronger program of pre-professional experiences will make our graduating seniors more employable by a variety of land management and conservation organizations.

B. Strategy/ies to achieve goal (list if more than one)

   1. Enhance one or more existing senior-level course in SNRE, or create a new course, to provide a capstone experience to help prepare students for professions in natural resources science and management.
   2. Work with agency and organization personnel (especially members of our new advisory boards) to find, create, and enhance pre-professional experiences within these agencies and organizations, and provide student mentoring by agency/organization personnel and SNRE faculty.
   3. Create opportunities for students returning from internships and other pre-professional experiences to interact with each other and with School faculty.

C. Actions

   Time Period (Fiscal Years)
   2014-2017

   1. Do items C.1., C.2, and C.3 above within the next three years.

Notes (if any)
Norton School of Family and Consumer Sciences
2021 Strategic Plan – Never Settle  
Submitted by: Norton School Faculty and Staff  
Fall, 2013

Table of Content

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<thead>
<tr>
<th>Norton School Purpose, Vision, Mission, Values</th>
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<td>Norton School Strategic Priorities</td>
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<td>Engaging – Undergraduate and Graduate</td>
<td>3-4</td>
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<td>Innovating</td>
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<td>Partnering</td>
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<tr>
<td>Synergy</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: The process by which the Norton School and Division plans were developed:

- The School Interim Director and the School’s Strategic Advisory Team (SAT) reviewed the May, 2012 CALS 2021 Strategic Plan Phase III document, and fall 2011 program review strategic planning documents.
- The development of Strategies and Actions related to teaching (engaging) were the focus of the August 2013 School retreat.
- The Interim Director integrated prior strategic plans into the Never Settle plan; faculty and key personnel were asked to provide input.
- The Interim Director revised the plan based on input and submitted to CALS, September 2013.
Norton School of Family and Consumer Sciences
Norton School 2021 STRATEGIC PLAN (Fall 2013)

The Norton School’s Purpose: Strengthen families, communities, and the marketplace through practical research, community and business partnerships, and education of future leaders in family and consumer sciences.

The Norton School’s 2021 Vision: to be globally prominent in education, research, and community and business partnerships in the field of family and consumer sciences; to produce graduates highly prized in the global economy; to be a magnet for public funding, private support, and partnerships dedicated to solving social problems for families, communities, and the marketplace.

The Norton School’s Mission: to provide high-quality education, research, cooperative extension programs, and community and business partnerships that strengthen families, communities and the marketplace.

The Norton School’s Shared Values: a diverse and inclusive community; excellence and integrity; innovation, partnership, and entrepreneurship; a collaborative ethos.

Purpose:
- To engage students to achieve their career and professional goals.
- To find innovative solutions to social problems facing families, communities, and the marketplace.

Outcomes of Vision:
- Increased percentage of graduates pursuing careers in chosen field
- 50% increase in annual expenditures (indexed to faculty FTE)
- Internships and/or research positions available to all students
- Increase number of B.S. degrees granted through online/distance programs
- Strong rate of transfer enrollments from Arizona Community Colleges with timely degree completion
- Closer alignment in teaching and research and cooperative extension with CALS21 priorities

What must be done to fulfill your unit’s purpose?
- Hire at minimum 4 new tenure-track faculty members (2 per program)
- Close curriculum gaps to continue offering competitive and adaptive education
- Recruit a dynamic permanent director for the School
- Recruit outstanding faculty and staff
- Recruit outstanding graduate and undergraduate students
- Sustain a culture of inclusion, excellence, innovation, entrepreneurship, and diversity
ENGAGING - Undergraduate: Achieve prominence in FCS undergraduate education: retailing and business leaders (RCSC); student placement in professions (medicine, law, social services) and graduate schools (FSHD)

A. Current situation and gap between current situation and desired situation
   1. Strong training and reputation
   2. Curriculum gaps in current critical sector needs (RCSC – e-commerce, supply chair, food retailing; FSHD - health)
   3. Insufficient base state funding for teaching, experiential learning and advising
   4. Insufficient funding for teaching assistantships; non-availability of RCSC graduate students
   5. Insufficient awareness of majors among incoming freshmen
   6. Overly large classes (FSHD); Under-enrollment in major and upper-division (RCSC)
   7. Strong, revenue-positive online/distance degree program options with significant growth potential
   8. Strong culture and support for student clubs
   9. Strong experiential learning components
   10. Small number of tenured/tenure-track faculty

B. Strategies to achieve goal
   1. Recruit a minimum 2 tenure-track faculty in each program: strengthen scholarship and engagement
   2. Hire assistant professor of practice to teach high-enrollment lower division courses
   3. Raise endowment funds for student support services and programs
   4. Address curricular gaps (RCSC – e-commerce, supply chair, food retailing; FSHD – health)
   5. Identify innovative recruitment strategies to attract top (high GPA) students into pre-majors
   6. Identify and remove barriers to movement from pre-majors to majors, and barriers to time to degree
   7. Explore innovations to extend reach of core and auxiliary program options beyond UA campus
   8. Explore partnerships (e.g., cross-listed courses) with CALS programs (AREC; Nutrition) and Eller; pipeline courses in general education format
   9. Utilize tenured faculty for upper division courses and research / application experiences
   10. Identify and publicize career tracks / options (especially FSHD)
   11. Adjust faculty teaching appointments commensurate with administration / research productivity
   12. Engage in competitive analysis and broad vision discussions about role and purpose of contemporary instruction innovations
   13. Monitor metrics (e.g., ABOR) and assessment tools; identify metrics that align with our Norton goal

C. Actions
   Time Period (Fiscal Years)
   1. Monitor and sustain high level of student services effectiveness FY14-17
   2. Revise Peer Review criteria to incentivize / reward grant activity; inclusion of new educational technologies in support of teaching / mentoring FY14-17
   3. Sustain endowment campaign (especially Terry J. Lundgren Center) FY14-20
   4. Secure base funding for teaching and mentoring FY14-20
   5. Recruit top incoming freshmen; improve time to degree FY14-20
   6. Offer experiential learning (internships, practicums, directed research) to all students FY14-20
   7. Track student internship and permanent placement (with CALS) FY14-20
   8. Strategically employ social media / communications FY14-20
   9. Reach out to AZ high school teacher / counselor associations FY14-20
   10. Recruit tenure-track faculty with expertise in gap areas of curriculum FY15-17
   11. Reach community college populations through innovative teaching strategies FY15-20

D. Inputs needed to achieve the goal
   1. Faculty lines sufficient for base curriculum needs
   2. Base funding for teaching and advising
   3. Integration and collaboration of Program and Center faculties

Appendix Page | 117
4. Development and fund allocation to support innovation strategies (e.g., blended courses)
5. UA/CALS infrastructure support for tracking alumni and graduate placement

E. Objective metrics that will be used to track progress towards attaining goal
1. Percentage of incoming freshmen declaring Norton pre-majors
2. Program retention / graduation rates
3. GPA of students admitted to pre-majors / majors
4. Percentage of students receiving position offers in their field prior to graduation
5. Percentage of students admitted to professional programs / graduate school prior to graduation
6. Number of retailing corporations serving on the TJL Center Corporate Advisory Board
7. Total amount of endowment in support towards Engaging goals
8. Number of Arizona Community College: partner articulations; transfers to online and campus degrees; transfers who graduate
9. Percentage of students with experiential learning opportunities (e.g., internships); percentage of courses with significant experiential learning component; percentage of courses that employ social media / communications components
10. Percentage and number of B.S. degrees granted via online and distance programs

ENGAGING - Graduate: Sustain prominence in graduate education

A. Current situation and gap between current situation and desired situation
1. RCSC concentration currently suspended due to shortage in research faculty positions
2. FSHD: strong training and reputation (NSF, Doris Duke Graduate Fellowships); Unsustainable funding model (limited long-term UA or CALS graduate research assistance)

B. Strategies to achieve goal
1. Recruit 2 tenure-track faculty in each program
2. Explore RCSC graduate education options (e.g.: minor in retail technology)
3. Create culture & provide training for fellowship- and grant-writing and scientific publication
4. Recruit top students
5. Raise / allocate private funds for graduate fellowships
6. Align program to CALS21 and UA goals – health sciences; big data; consumer / retail sciences related to environment, food, energy, water, and natural/bio resources

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Offer competitive assistantships</td>
<td>FY14-FY20</td>
</tr>
<tr>
<td>2. Provide opportunities for teaching experience in multiple modes</td>
<td>FY14-FY20</td>
</tr>
<tr>
<td>3. Offer high quality research/teaching experiences and summer fellowships</td>
<td>FY14-FY20</td>
</tr>
<tr>
<td>4. Develop an innovative recruitment strategy</td>
<td>FY14-FY20</td>
</tr>
<tr>
<td>5. Reduce time-to-degree – incorporate expectation into student annual review</td>
<td>FY14-FY15</td>
</tr>
<tr>
<td>6. Allocate funds to support development of RCSC graduate options</td>
<td>FY14-FY20</td>
</tr>
<tr>
<td>7. Prioritize School funding for graduate students with past external funding success</td>
<td>FY15-FY20</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
1. Gift and endowment earnings / allocations
2. Faculty grants
3. Faculty reward system for mentoring and financially supporting graduate students
4. New faculty hires with necessary expertise for achieving CALS21 priorities

E. Objective Metrics that will be used to track progress towards attaining goal
1. GRE scores; undergraduate GPA
2. Time-to-degree
3. National awards (e.g., NSF / Doris Duke fellowships)
4. Publication and teaching records and associated metrics
5. Student placement record
INNOVATING: Sustain, strengthen, and expand funded research, outreach, and partnering activities that address grand challenges for families, communities and the marketplace

A. Current situation and gap between current situation and desired situation
   1. Heavy teaching loads for research-appointed faculty (significant inequity in CALS)
   2. Significant disparity among the faculty with respect to grant records
   3. Strong infrastructure for many needs (e.g., state-of-the art Lang Laboratory) but insufficient staffing

B. Strategies to achieve goal
   1. Encourage research emphases on health, big data, mobile / technologies
   2. Align research with priorities of potential funders (CALS21 and UA priorities, NIH/NSF/USDA priorities, major foundation priorities)
   3. Encourage and reward interdisciplinary collaboration in School, CALS, and UA; explore alignment opportunities with AREC
   4. Reallocation state salaries to support teaching and extramurally-funded research programs / reduce faculty teaching loads based on research productivity
   5. Assess research and grant activity and reward high-achieving faculty members
   6. Strengthen the pre/post grant services infrastructure
   7. Realign all research endowments to faculty with achievements in grant-funded research and demonstrated scientific productivity / impact
   8. Secure funding for Cooperative Extension faculty positions (youth development; evaluation; financial literacy)
   9. Develop metrics for Cooperative Extension and outreach program impacts

C. Actions

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
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</thead>
<tbody>
<tr>
<td>All research-appointed personnel sign-up for Google Scholar profiles; PIVOT; ResearchGate; etc. FY14</td>
</tr>
<tr>
<td>Revise the Peer Review criteria to include a system to incentivize / reward Collaboration, faculty grant activities, and scientific impact FY14-15</td>
</tr>
<tr>
<td>Continue to strengthen pre/post grant services infrastructure FY14-15</td>
</tr>
<tr>
<td>Continue to raise private funds / build industry partners for research infrastructure FY14-20</td>
</tr>
<tr>
<td>Partner in CALS to develop Cooperative Extension / outreach metrics FY14-20</td>
</tr>
<tr>
<td>Strategically employ social media / communications to share successes FY14-20</td>
</tr>
<tr>
<td>Institute/Center funded research: FMI – sustain; TCAI – augment; TJLC – identify new models or opportunities for research footprint FY14-20</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal

1. State-funded traditional faculty lines in emphasis areas and Cooperative Extension faculty lines
2. Excellent business center
3. Faculty understanding of resource culture; commitment to interdisciplinary collaboration and UA/CALS priorities

E. Objective Metrics that will be used to track progress towards attaining goal

1. Number and amount of extramural grants obtained for research and outreach
2. Faculty productivity index, citations, publications, awards
3. Social impact metrics for extramurally-funded research and program activities
4. Number of School, CALS, and UA collaborators
5. Number of faculty affiliates associated with Norton Center/Institutes
PARTNERING: Sustain, strengthen and expand partnerships that address grand challenges for families, communities and the marketplace

A. Current situation and gap between current situation and desired situation
   1. Strong partnerships with private funders
   2. Outstanding business partnerships (TJLC) and strong NGO / local K-12 education partnerships (TCAI, FMI, Cooperative Extension, Student Services)
   3. Strong Cooperative Extension partnerships but small capacity and infrastructure
   4. Gaps in curriculum and expertise for focal partnership needs (health sciences; retail analytics and technology)
   5. Strong network of alumni and friends who promote and support our work and offer connections

B. Strategies to achieve goal
   1. Encourage and reward collaboration and partnerships with industry and other stakeholders
   2. Secure funding for Cooperative Extension faculty positions (youth development; evaluation; financial literacy)
   3. Develop metrics for Cooperative Extension and outreach program impacts
   4. Sustain / build relationships with business, community groups, government, and alumni/supporters
   5. Develop strategic plan for development

C. Actions
   Time Period (Fiscal Years)
   1. Increase communication and collaboration in the School regarding teaching, research, and Extension projects and internships to maximize relationships FY14-20
   2. Revise the Peer Review criteria to include a system to incentivize / reward partnering FY14-15
   3. Continue to strengthen pre/post grant services infrastructure, and business systems and policies / procedures to facilitate entrepreneurial partnerships FY14-20
   4. Continue to raise private funds to support Institutes and Center and partnering opportunities FY14-20
   5. Partner in CALS to develop Cooperative Extension / outreach metrics FY14-20
   6. Identify key partnering prospects across sectors (business, community, government), prioritize, and plan partnership building FY14-20
   7. Enact development plan; support Council of Alumni and Friends activities; sustain Norton Advisory and Center/Institute Boards FY14-20

D. Inputs needed to achieve the goal
   1. State-funded traditional faculty lines and Cooperative Extension faculty lines
   2. Excellent business center and clear policies and procedures for partnering
   3. Excellent development staff in School, CALS, and UA to support goals

E. Objective Metrics that will be used to track progress towards attaining goal
   1. Number and amount of extramural gifts, grants, and contracts
   2. Number of School, CALS, and UA partnerships
   3. Numbers of partnerships with business, community group, and government organizations
SYNERGY: Build and sustain an effective, efficient, entrepreneurial infrastructure for change

A. Current situation and gap between current situation and desired situation
   1. Thin but stabilizing staff infrastructure; extraordinary staff and appointed personnel
   2. Sophisticated communications / public relations staff and outstanding results
   3. Strong network of alumni and friends who promote and support our work and offer connections
   4. Extraordinary history of and reputation for development
   5. Culture that recognizes, supports and actively seeks diversity

B. Strategies to achieve goal
   1. Encourage and reward strategic communications
   2. Sustain / build relationships with business, community groups, and government
   3. Support Council of Alumni and Friends; nurture Norton Advisory Board; nurture Center/Institute boards
   4. Develop strategic plan for development
   5. Sustain dynamic leadership at all levels
   6. Discern our distinct local knowledge and contributions, and associated role for global applications
   7. Engage in broad vision discussions about role and purpose of contemporary higher education challenges, possibilities and innovations
   8. Identify outreach successes and synergies, and highlight through strategic communications
   9. Learn from other models of synergy in CALS, UA and other institutions

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
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<tbody>
<tr>
<td>FY14-FY15</td>
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<tr>
<td>FY14-FY20</td>
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<tr>
<td>FY14-FY20</td>
</tr>
<tr>
<td>FY14-FY20</td>
</tr>
<tr>
<td>FY14-FY20</td>
</tr>
</tbody>
</table>

   1. Revise the Peer Review criteria to include a system to incentivize / reward collaboration; partnering; strategic communications
   2. Identify key partnering prospects across sectors (business, community, government), prioritize, and plan partnership building
   3. Enact development plan; support Council of Alumni and Friends activities; Sustain Norton Advisory and Center/Institute Boards
   4. Strategically employ social media / communications to share successes
   5. Acknowledge and reward outstanding staff and appointed personnel

D. Inputs needed to achieve the goal
   1. Faculty and staff contribution to culture of diversity and synergy
   2. Excellent development, business, IT, and communications staff in School, CALS, and UA to support goals

E. Objective Metrics that will be used to track progress towards attaining goal
   1. Number and amount of extramural gifts, grants, and contracts
   2. Number of School, CALS, and UA partnerships
   3. Numbers of partnerships with business, community group, and government organizations (and how they relate to grants/donations)
   4. Number of alumni in network (active on boards; communications) and alumni donations
   5. Number and impact of public media stories/outreach
   6. Trajectory of faculty synergistic activities, e.g., collaborations and strategic communications
Nutritional Sciences
NSC’s Purpose:
  Advance knowledge of nutrition in the promotion of health.

NSC’s 2021 Vision:
  To discover, integrate, extend and apply knowledge of Nutritional Science to promote optimal health and to prevent or treat disease.

NSC’s Mission:
  To provide outstanding research, graduate and undergraduate programs, and outreach education that advances nutrition and physical activity in optimizing health for all people.

  Graduates from our programs will be imbued with our values and will carry forward the unit’s vision in their future endeavors.

NSC’s Shared Values:
Mutual Respect in a Diverse and Inclusive Community
Excellence
Innovation and Entrepreneurial Action
Integrity
Partnerships and Interdisciplinary Collaboration
FUNDRAISING

STRATEGIC GOAL ONE: Deepen the Department Financial Foundation

A. Current situation
   The Department needs to supplement revenue from instruction (which is stable, with good potential for growth) and sponsored projects (which is volatile) with other sources of revenue and support. A multi-faceted development plan is needed.

B. Strategies to achieve goal
   1. Establish Development Committee and create a development plan.
   2. Engage CALS Development Office in support of a development plan.
   3. Enhance relationship with alumni and engage alumni in fundraising efforts.
   4. Identify and engage industry partners.
   5. Pursue revenue generating clinical and educational opportunities, e.g., clinical or fee for service outreach; distance education.

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convene Development Committee to create development plan.</td>
<td>FY 12-13</td>
</tr>
<tr>
<td>Meet with CALS Development Office and enlist their aid.</td>
<td>FY13-ongoing</td>
</tr>
<tr>
<td>Identify potential industry partners and pursue partnerships.</td>
<td>FY13-ongoing</td>
</tr>
<tr>
<td>Make newsletter more alumni focused.</td>
<td>FY12-ongoing</td>
</tr>
<tr>
<td>Create Alumni Advisory Board.</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Identify and pursue donors.</td>
<td>FY13-ongoing</td>
</tr>
</tbody>
</table>

D. Inputs
   - Faculty
   - Alumni involvement
   - CALS Development Office

E. Objective Metrics
   - Alumni participating on Advisory Board.
   - Alumni financial contributions.
   - Industry partners; sponsorships.
   - Donors and support from Donors.
UNDERGRADUATE PROGRAM

STRATEGIC GOAL TWO: Expand Access and Enhance Educational Success of Undergraduate Students:
Increase enrollment to 800 students by spring 2017.

A. Current situation and gap between current situation and desired situation

<table>
<thead>
<tr>
<th>Enrollment</th>
<th>Dietetics</th>
<th>Nutrition</th>
<th>Undeclared</th>
<th>Total Undergraduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2012</td>
<td>336 (63%)</td>
<td>126 (24%)</td>
<td>70 (13%)</td>
<td>532</td>
</tr>
<tr>
<td>Spring 2013</td>
<td>400 (67%)</td>
<td>200 (33%)</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>400 (62%)</td>
<td>250 (38%)</td>
<td>0</td>
<td>650</td>
</tr>
<tr>
<td>Spring 2015</td>
<td>400 (57%)</td>
<td>300 (43%)</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>Spring 2016</td>
<td>375 (50%)</td>
<td>375 (50%)</td>
<td>0</td>
<td>750</td>
</tr>
<tr>
<td>Spring 2017</td>
<td>375 (47%)</td>
<td>425 (53%)</td>
<td>0</td>
<td>800</td>
</tr>
</tbody>
</table>

Planned enrollment expansion will proceed with caution, balancing demand and resources. Pre-professional and wellness-focused students will be targeted to increase enrollments in a new Nutrition option. A non-accredited flexible Nutrition option in NSC will allow greater student access to meet the demand of a popular undergraduate major. Dwindling dietetic internship opportunities necessitate alternative routes for students seeking nutrition education and careers. Smaller numbers of students in the accredited Dietetics option will improve overall management and tracking of these students, as well as internship placement rates.

B. Strategies to achieve goal

1. Increase recruitment efforts of pre-professional students (pre-medicine, pre-pharmacy, pre-dental, PA, PT, nursing).
2. Provide flexible learning modalities, such as online courses, modules, and certification programs aimed at serving more students and generating revenue.
3. Increase diversity of undergraduate course offerings serving wellness-focused students and the greater university student population.
4. Expand winter and summer sessions offerings and associated enrollments, serving more students and generating revenue.
5. Provide focused academic and career advising to aid students in determining appropriate route within the NSC major and education/career options post-graduation.
6. Provide increased opportunities for undergraduate mentoring, research and professional development.

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit Multicultural Scholars Program Undergraduate Training Grant (underway)</td>
<td>FY13</td>
</tr>
<tr>
<td>Actively recruit pre-professional students on and off campus, including at community colleges.</td>
<td>FY13-17</td>
</tr>
<tr>
<td>Coordinate with Pima Community College and other Arizona community colleges to create 2+2 programs.</td>
<td>FY13-17</td>
</tr>
<tr>
<td>Expand current online course offerings.</td>
<td>FY13-17</td>
</tr>
<tr>
<td>Create courses in cultural foods and food safety.</td>
<td>FY14</td>
</tr>
<tr>
<td>Implement course in public policy and food security.</td>
<td>FY13</td>
</tr>
<tr>
<td>Review and revise current undergraduate curriculum to reflect changes in professional schools’ prerequisites, as well as changes in Dietetics accreditation standards</td>
<td>FY13-ongoing</td>
</tr>
<tr>
<td>Promote membership in UA student organizations, as well as professional organizations</td>
<td>FY13-17</td>
</tr>
<tr>
<td>Input</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Faculty and students</td>
<td>Graduate assistants to support increased enrollment in current courses, as well as newly developed courses</td>
</tr>
<tr>
<td>Technical and web-based support for online courses, revised undergraduate website, and social media</td>
<td>Relationship with Career Services, on-campus collaborators, and off-campus interests</td>
</tr>
<tr>
<td>Alumni and other community members engaged in student mentoring; fund raising.</td>
<td>Funding for undergraduate research endeavors</td>
</tr>
</tbody>
</table>

**E. Objective metrics that will be used to track progress towards attaining goal**

- Enrollment numbers by option and delivery method (face-to-face; online).
- Number of recruitment events held; attendance at events, and number who enroll in NSC majors.
- Number of undergraduates engaged in conducting research.
- Enrollment in current courses.
- Number of new courses created and enrollment in new courses.
- Student feedback regarding advising model.
- Student placement into professional programs.
- Revenue generated by winter, summer courses; courses through Outreach College.
UNDERGRADUATE PROGRAM

STRATEGIC GOAL THREE: Expand Access and Enhance Educational Success of Undergraduate Students: Improve placement in viable post-graduate careers including dietetic internships and professional – graduate school by 50%

A. Current situation and gap between current situation and desired situation
Currently our placement rates for dietetic internships are below expectations and our post-graduate career data is incomplete.

B. Strategies to achieve goal
- Develop UA/NSC Dietetics Internship Program (outlined in separate strategic goal document).
- Create new advising model to better direct the student toward success.
- Improve access to information to connect students with extracurricular experiences and mentoring with faculty.
- Perform Learning Outcomes Assessment on undergraduate courses to fine-tune course objectives towards skills necessary to compete.

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social media site (Facebook) has been created to connect students with experience and job opportunities</td>
<td>FY 2012-ongoing</td>
</tr>
<tr>
<td>Post research and community program opportunities for undergraduate students beginning of Fall 2012 semester</td>
<td>FY 2012-ongoing</td>
</tr>
<tr>
<td>Collect current student progress and placement via social media sites</td>
<td>FY 2012-ongoing</td>
</tr>
</tbody>
</table>

D. Input needed to achieve the goal
Increased teaching faculty for teaching, mentoring, and coordination of dietetic internship.

E. Objective Metrics that will be used to track progress towards attaining goal
Student success numbers on post-graduation placement, including:
- dietetic internships
- professional schools
- jobs
GRADUATE PROGRAM

STRATEGIC GOAL FOUR: Expand Access and Enhance Educational Success of Students: Enhance graduate student recruitment.

A. Current situation and gap between current situation and desired situation
We aspire to an international reputation for training doctoral students in our signature areas who have the skills (content expertise, strong research methods, and “soft” skills) needed for independent inquiry and to become contributing members of interdisciplinary teams. Despite excellent academic and research programs the quantity and quality of the graduate applicant pool has declined. An active recruitment (“marketing”) plan is needed.

B. Strategies to achieve goal
1. Develop marketing plan.
2. Update website – enhance appeal for graduate student “market”
3. Develop an electronic brochure
4. Seek feedback from applicants who declined offers

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convene working group to develop a marketing plan</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Post testimonials of current graduate students on website</td>
<td>FY12-ongoing</td>
</tr>
<tr>
<td>Showcase former graduate students by job sector on website</td>
<td>FY12-ongoing</td>
</tr>
<tr>
<td>Working with a graphics designer, develop effective electronic brochures</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Complete electronic brochure and send to stakeholders</td>
<td>FY13</td>
</tr>
<tr>
<td>Validate that relevant professional societies (e.g., ASN, ACSM, AND) have the most current information for our program</td>
<td>FY12-ongoing</td>
</tr>
<tr>
<td>Implement marketing plan</td>
<td>FY13-ongoing</td>
</tr>
<tr>
<td>Engage applicants who declined offers to provide areas of improvement</td>
<td>FY12-ongoing</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Engage current and former students
- Department IT staff
- Graphics designer
- Feedback from undergraduate research groups (UBRP, MARC, McNair, etc)
- Feedback from applicants that declined offers
- Funding for campus visits by top candidates

E. Objective metrics that will be used to track progress towards attaining goal
- Number applicants to graduate program
- Number of quality applicants as assessed by admissions committee
- Number of visits to graduate program webpage
- Number of out-of-state applicants; number of international students.
- Admissions
GRADUATE PROGRAM

STRATEGIC GOAL FIVE: Expand Access and Enhance Educational Success of Students: Double graduate student funding by 2017

A. Current situation gap between current situation and desired situation
Our funds for graduate training are dependent on University and College money for Graduate Assistants (which has dwindled) and research faculty grants. As resources dwindle, it is essential to find other sources of revenue to support our student’s training.

B. Strategies to achieve goal
1. Utilize training grant opportunities to fund students
2. Develop an alternative funding model that does not rely on federal grants (e.g., industry partners)
3. Require PhD students to submit a fellowship grant
4. Faculty hires with external funding to support graduate students.

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY13-14</td>
<td>Renew the USDA/NIFA National Needs Fellows training grant (target expertise shortage area – Human Nutrition and Obesity)</td>
</tr>
<tr>
<td>FY13-15</td>
<td>Convene working group to develop and submit a pre-doctoral training grant in signature area of cancer biology (e.g., could be related to obesity and cancer)</td>
</tr>
<tr>
<td>FY13-14</td>
<td>Introduce a requirement for PhD students to submit a fellowship grant at the end of 3 semesters</td>
</tr>
<tr>
<td>FY13-ongoing</td>
<td>Develop and implement a new funding model action plan for our graduate assistantships (e.g., industry sponsors of graduate students; donors of “Endowed” assistantships)</td>
</tr>
<tr>
<td>FY13-ongoing</td>
<td>Establish Alumni Advisory Board to assist with fundraising initiative</td>
</tr>
<tr>
<td>FY12-ongoing</td>
<td>Establish a working group to identify Fellowship opportunities</td>
</tr>
<tr>
<td>FY13-ongoing</td>
<td>Add authorship of a Fellowship application to core graduate course (e.g., NSC 520, Advanced Nutritional Sciences.</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Faculty, students, and Alumni
- Program directors from federal funding agencies
- List of alumni by job sector

E. Objective Metrics that will be used to track progress towards attaining goal
- Training grants submitted and awards received; number of students supported by training grants.
- Number of pre-doctoral fellowships submitted by graduate students; awards received.
- Number of faculty involved in the mentoring of training grant trainees.
- Number of contact hours with potential donors; donors.
- Sponsorship of students by industry and other donors.
- Number of alumni engaged in fundraising.
GRADUATE PROGRAM

STRATEGIC GOAL SIX: Expand Access and Enhance Educational Success of Students: Enhance mentoring for graduate students

A. Current situation and gap between current situation and desired situation

The Nutritional Sciences Graduate Program (NSGP) does not currently have input from outside resources related to the success and assessment of the program. An external advisory board could fill this need by providing useful feedback related to our educational objectives, curriculum development, fund raising efforts, student preparation for the work force, placement of graduates after completion of their degree and assessment goals of the program. An external advisory board can provide perspective, support and advice to the NSGP that is current, up-to-date and relevant to professional practice. They could assist in the development of new curriculum and program initiatives, assessment of the labor market and identifying strategies to advance the NSGP at the local, state, national and international level. Their active participation can present opportunities for outside mentoring beyond our core and adjunct faculty.

B. Strategies to achieve goal

- Identify and recruit successful, influential Alumni and other stakeholders with desired credentials for service on an Advisory Board.
- Develop operating guidelines for recruiting advisory board members, selection criteria, surveys and other tools for obtaining input and reports.

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>External Nutritional Sciences Graduate Program Advisory Board:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY12-13</td>
<td>The NSGP Executive Committee will determine selection criteria and develop a list of prospective board members.</td>
</tr>
<tr>
<td>FY12-13</td>
<td>The NSGP Executive Committee will develop operating guidelines for the advisory board.</td>
</tr>
<tr>
<td>FY 13-14</td>
<td>Recruit advisory board members.</td>
</tr>
<tr>
<td>FY13-14</td>
<td>Convene Advisory Board; The Advisory Board will select a Chair from the board members.</td>
</tr>
<tr>
<td>FY14, Each FY</td>
<td>The Advisory board will meet on a regular basis and document its work.</td>
</tr>
<tr>
<td>FY12-13</td>
<td>Develop marketing strategies to enhance attendance at advisory board meetings including invitations at least 3 months in advance, follow up emails and telephone calls a month prior to meeting as reminder, any materials needed for meeting sent out 1 month prior to meeting and follow up thank you cards.</td>
</tr>
<tr>
<td>FY13-ongoing</td>
<td>Send department newsletters, seminar announcements, award announcements to advisory committee to keep the program on their mind.</td>
</tr>
<tr>
<td>FY13-ongoing</td>
<td>Invite advisory board members to present a seminar.</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal

- Advisory committee members
- Faculty (NSGP Executive Committee) time for planning
- Resources for planning meeting; materials; conference calls
- Travel costs
- Incentives (monetary, other) for Advisory Board service.

E. Objective metrics that will be used to track progress towards attaining goal

- Advisory Board members and participation; types of input for Advisory Board members.
• Programmatic revisions arising from Advisory Board input.
• Mentoring opportunities afforded students for Advisory Board members through their contacts.
• Donor relationships cultivated with Advisory Board input.
• Funds raised.
• Placement of graduate students upon graduation.
• Results of graduate student exit surveys.
• Statistics on graduate program including time to degree, number of degrees awarded.
• 5 and 10 year postgraduate survey.
PROFESSIONAL PROGRAMS

STRATEGIC GOAL SEVEN: Expand Access and Enhance Educational (and Professional) Success of Undergraduate and Graduate Students: Increase number of successful applicants to supervised practice programs (Dietetic Internships)

J. Current situation and gap between current situation and desired situation:
The demand for nutrition professionals is projected to increase through the year 2020 (Hooker et al J Acad Nutr Diet 2012 Suppl 1; 112(3): S75). To help meet this demand, the Department of Nutritional Sciences currently offers a Didactic Program in Dietetics (DPD), a pre-professional undergraduate program that prepares students to apply for professional dietetic internships (DI’s). DI’s are nationally accredited professional training programs, requiring 1,200+ supervised hours, the majority of which take place in a clinical (i.e. hospital) setting. Successful completion of a DI allows graduates to become accredited nutrition professionals - Registered Dietitians. There are currently many more DI applicants than there are DI placements. In 2012, graduates of our undergraduate DPD program experienced a 32% acceptance rate into DI programs, ~ 18% lower than the national average.

FY12-17 GOAL: Over a 5-year period, 60% of DPD graduates will apply to supervised practice programs the academic year they complete the DPD program; over 80% of those applying will be accepted.

FY17-21 GOAL: Over a 5-year period, 75% of DPD graduates will apply to supervised practice programs the academic year they complete the DPD program; over 90% of those applying will be accepted.
(The University of Arizona, Dietetic Internship; UA-DI)

K. Strategies to achieve goal
Develop a postgraduate professional internship program for graduates of UA and other DPD programs with options such as Community Nutrition & Regional Food Systems, in addition to the traditional focus on clinical dietetics.

L. Actions (Fiscal) Time Period

<table>
<thead>
<tr>
<th>Actions (Fiscal)</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete and submit DI self-study report for new program application to the Commission on Accreditation for Dietetics Education (CADE)</td>
<td>FY12-14</td>
</tr>
<tr>
<td>o Convene a UA-DI committee comprised of NSC faculty and staff</td>
<td></td>
</tr>
<tr>
<td>o Determine DI program structure &amp; finances (approximately &gt; $10,000 tuition fee per student)</td>
<td></td>
</tr>
<tr>
<td>o Determine DI program characteristics (program mission, goals, outcomes, assessment, improvement)</td>
<td></td>
</tr>
<tr>
<td>o Develop DI curriculum (learning activities, program concentrations, curriculum length, learning assessment, ongoing curricular improvement)</td>
<td></td>
</tr>
<tr>
<td>o Identify DI Program Managers and develop Management Plan (qualifications of program director, responsibilities, program resources, faculty, preceptors, continuing professional development, supervised practice facilities, program information, policies and procedures, program handbook)</td>
<td></td>
</tr>
</tbody>
</table>

| Obtain accredited status for a DI program and enroll 4 interns for pilot year (UA DPD program graduates) | FY14 |

| Expand enrollment to 10 interns annually (~5 from UA DPD program and ~5 from other regions), generating $10,000 x 10 = $100,000 annually in program revenue | FY15 |
M. Inputs needed to achieve the goal:
• 0.50 FTE Program Director (Registered Dietitian with MS or higher in Nutrition)
• 0.50 FTE Program Coordinator (Registered Dietitian with MS or higher in Nutrition)
• Faculty Mentors (NSC, Public Health, Extension)
• Community preceptors

N. Objective metrics that will be used to track progress towards attaining goal:
1. Number of sites and strategic partners who will serve as preceptors for DI program interns.
2. Professional internship application rate and acceptance rate.
3. Number (and type) of career placements of DPD students and DI graduates.
4. Revenue generated by UA-DI program.

Notes: The dietetics profession is changing, and to remain at the forefront of the health and nutrition profession, our students must be adequately prepared to take on new public priorities as they arise (health care reform; food security), deal with changes in the population (an increasingly diverse and aging population), and take advantage of advances in science and technology (health informatics, personalized medicine, mobile health), all of which influence how people live, learn and work. Successful graduates and professionals will be able to respond to these changes by applying a core set of skills and competencies to any nutrition-related issue. In addition to integrating these concepts into coursework, the UA Department of Nutritional Sciences should offer a NEW opportunity for post-graduate student training – a professional internship program for nutrition students, the University of Arizona Dietetic Internship (UA-DI).

A DI program at the University of Arizona would create revenue opportunities and increase visibility of the Department of Nutritional Sciences and the College of Agriculture & Life Sciences within the surrounding community, the State of Arizona, and the country.
STRATEGIC ALLIANCES

STRATEGIC GOAL EIGHT: Strengthen existing alliances and create new strategic alliances with other units at UA that will support attainment of strategic directions including i) Expand access and enhance educational success of students, ii) Attract outstanding faculty and staff, iii) provide infrastructure to support excellence in discovery, learning and engagement, and iv) Deepen a strong financial foundation.

A. Current situation and gap between current situation and desired situation

Strategic alliances with UA units within and outside of CALS have the potential to leverage resources by sharing strategic hires, equipment and other research resources, development of interdisciplinary research grant applications, and innovative academic programs responding to societal changes and improving job prospects for our graduates.

An example is the recently established Strategic Alliance with COM Diabetes Program. Research grants are already underway and shared strategic hires are planned. Some faculty in the Diabetes Program are joint appointed in the Nutritional Sciences Graduate Program and are advising NSC graduate students. Opportunities exist with other units. For example, a dialogue has begun with the Norton School’s Retailing and Consumer Sciences program to develop a concentration area for NSC students which would strengthen job prospects for non-dietetic nutrition majors who would seek employment in food retailing industries. Other Strategic Alliances can be formed designed to strengthen the collaborating units.

B. Strategies to achieve goal

1. Study shifting job market and needs, and identify opportunities for graduates trained in nutritional sciences;
2. Identify skills needed to compete for non-dietetic nutrition related jobs;
3. Identify UA programs that would enhance training of nutritional science students;
4. Create study areas of concentration with appeal to nutritional science majors linked to job market;
5. Establish relationships (strategic alliances) with UA units supporting instruction and research priorities;
6. Establish curriculum and requirements for minor and/or certificate programs and mechanisms of instruction (traditional versus online);
7. Identify potential industry partners and establish relationships for internships, post graduate placement, sponsorships and other funding opportunities.
8. Develop research grants with strategic partners.

C. Actions

<table>
<thead>
<tr>
<th>Time Period (Fiscal Years)</th>
<th>Convene committee to assess job market trends, solicit input from alumni; industry leaders, students, other faculty – identify post graduate opportunities and necessary skill sets.</th>
<th>FY12-14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identify potential partners (e.g., Norton School, COPH, Physiological Sciences, others) aligned with our student needs; Establish strategic alliances.</td>
<td>FY12-14;ongoing</td>
</tr>
<tr>
<td></td>
<td>Create study areas of concentration; Establish curriculum and requirements for minor or certificate programs; mechanisms of instruction.</td>
<td>FY13-15;ongoing</td>
</tr>
<tr>
<td></td>
<td>Identify and engage industry partners.</td>
<td>FY13-14;ongoing</td>
</tr>
<tr>
<td></td>
<td>Develop marketing strategy targeting on campus, off campus, and industry partners.</td>
<td>FY14-15</td>
</tr>
<tr>
<td></td>
<td>Offer new areas of concentration to undergraduate NSC majors.</td>
<td>FY15-ongoing</td>
</tr>
<tr>
<td></td>
<td>Submit research grants with strategic partners.</td>
<td>FY14-ongoing</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal

- Faculty (NSC and strategic partners),
- Graduate teaching assistants
- Technical, web-based support for online classes
- Industry partners
- Alumni partners

E. **Objective metrics that will be used to track progress towards attaining goal**
- Strategic partnerships formed
- Industry partners
- New courses offered
- Student enrollment in new minors/certificates.
- Student placement
- Revenue generated by winter/summer courses; online classes
- Donors and funds received
INFRASTRUCTURE

STRATEGIC GOAL NINE: Provide infrastructure to support excellence in discovery, learning and engagement: with strategic partners (e.g., COM, COPH), establish and develop the “Collaboratory for Metabolic Disease Prevention and Treatment”.

A. Current situation
Our research faculty are scattered on campus and some are housed in subpar facilities that are difficult for research volunteers to access. The current situation is an impediment to longitudinal human trials, particularly for projects targeting lower socioeconomic status, underserved communities who suffer a higher proportion of chronic disease.

Access to Hispanic and American Indian populations strengthens our community and clinical research applications. However, it is difficult for these groups to come to campus, hurting recruitment and retention. A Center (“Collaboratory”) close to these populations with both community prevention activities and research would benefit the community, foster research and support recruitment and retention, as well as promote the University and its programs to these under-represented communities.

B. Strategies to achieve goal
1. Form strategic alliances with units on campus engaged in like-minded community programs and research activities.
2. Collaborate on Center programmatic initiatives and research applications.
3. Collaborate on strategic, targeted hires.
4. Collaborate on development and fundraising activities.

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formalize strategic alliance among UA units (e.g., CALS, COM and COPH)</td>
<td>FY12</td>
</tr>
<tr>
<td>Establish and convene “Collaboratory” steering committee with representatives of participating units</td>
<td>FY12</td>
</tr>
<tr>
<td>Develop working guidelines, formalize administrative structure, mission and vision statement; business plan.</td>
<td>FY12</td>
</tr>
<tr>
<td>Engage development offices of participating units; create and pursue development plan.</td>
<td>FY12-13; ongoing</td>
</tr>
<tr>
<td>Establish supporting “Collaboratory” divisions, e.g., i) community outreach and ii) research.</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Convene regular planning meetings within divisions designed to integrate programs where possible, desirable; streamline, increase efficiency; develop new programs, grant opportunities, leverage funds.</td>
<td>FY12; ongoing</td>
</tr>
<tr>
<td>Establish community advisory board</td>
<td>FY13; ongoing</td>
</tr>
<tr>
<td>Planning for center grant, to be submitted in 3-5 years, depending on “collaboratory” programs, e.g., an Obesity Center.</td>
<td>FY13-16</td>
</tr>
</tbody>
</table>

D. Inputs
- Faculty
- Development officers
- Community members – community advisory board
- Targeted, shared faculty hires
- Funding (IDC’s, etc) for appropriate off-campus facility

E. Objective Metrics
- Participating units; collaborative projects
- Facilities
- Programmatic initiatives and RO1
• Sponsored Projects revenues
• Donors – industry; private
• Community feedback
INFRASTRUCTURE

STRATEGIC GOAL TEN: Provide infrastructure to support excellence in discovery, learning and engagement – Build for the Future: Plan and develop a building campaign or locate investigators (research signature area, cancer biology) strategically.

A. Current situation
Infrastructure to support the investigators in the behavioral component of our signature areas is addressed by the Collaboratory and the move to Kino. Faculty in the signature area of basic research, particularly cancer-related research, need to be located near their colleagues on the medical campus to have access to the patients, human tissue samples and proper equipment. In order to complete their work, they are gradually moving to the Cancer Center. This fractures the Department and causes a loss of research dollars from CALS and the Department to the Cancer Center. We need to locate as a group to a facility closer to the medical center. The laboratories that we occupy are very old and problematic as well.

B. Strategies to achieve goal
1. Locate basic researchers into Keating Building as a group.
2. Locate as a group in new building on North Campus near COM and the Cancer Center.
3. Develop a building campaign for a new building.

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convene NSC basic researchers to describe need and develop proposal that addresses those needs.</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Explore existing options on campus to locate as a group.</td>
<td>FY13</td>
</tr>
<tr>
<td>Engage CALS Development Office to develop “building campaign”.</td>
<td>FY13-ongoing</td>
</tr>
<tr>
<td>Identify and pursue potential donors.</td>
<td>FY13-ongoing</td>
</tr>
</tbody>
</table>

D. Inputs
- Faculty and staff.
- CALS Development Office
- Alumni/Community Advisory Board
- Donors

E. Objective Metrics
- Completion of development plan.
- Donor support (revenue)
- Successful move to new space.
- Statistics on graduate program including time to degree, number of degrees awarded.
- 5 and 10 year postgraduate survey.
RESEARCH

STRATEGIC GOAL ELEVEN: Advance in signature research areas and support a strong culture of research productivity and mentoring: Attract and retain outstanding and diverse faculty and staff to advance signature research areas.

A. Current situation

Research funding has nearly doubled over the past four years and a six-year analysis of sponsored project funding showed we rank 3\textsuperscript{rd} in CALS of all units. Our signature research areas are highly fundable (funded by NIH, USDA, DOD, NSF, DOE, etc.) and we have competed for grants successfully. Nevertheless, our current success is jeopardized by recent faculty attrition, particularly at full professor level. These include the following individuals with their research capacity for NIH funding and full time equivalent:

1. *Darrel Goll (2-3 million; NIH) 1.0 FTE
2. *Cynthia Thomson (2-3 million; NIH) 1.0 FTE
3. *Linda Houtkooper (1-2 million; NIH) 0.5 FTE
4. *Joy Winzerling (1-2 million; NIH) 1.0 FTE Admin
5. *David Hartshorne (Retirement Pending 2013; 1-2 million) 1.0 FTE

*Full Professors

Estimated Total Funding Capacity lost or greatly reduced: $7-12 million; FTE Lost: 4.5

Replacement Faculty:

1. Jennifer Teske (Assistant Professor, capacity unknown); 0.5 FTE; VA Appointment

B. Strategies

1. Identify strategic partners, create alliances, and pursue shared strategic hires.
2. Develop research professorial appointments.
3. Engage CALS development office and pursue donors for endowed faculty.
4. Submit grants for fellowships for postdoctoral training in NSC signature areas.
5. Negotiate hires with CALS Dean and EC to replace lost NSC faculty.
6. Strengthen mentoring in progress to promotion and tenure/continuing status to assure hires are successful.
7. Seek nominations for awards and honors.
8. Reward excellence (salary, space, travel funds, bonus).

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit strategic hiring plan to CALS administration.</td>
<td>FY12-ongoing</td>
</tr>
<tr>
<td>Create alumni/community advisory board to support fundraising/donors.</td>
<td>FY12-13;ongoing</td>
</tr>
<tr>
<td>Identify and pursue potential donors</td>
<td>FY12-ongoing</td>
</tr>
<tr>
<td>Create development plan with CALS development office and institute the plan.</td>
<td>FY12-13;ongoing</td>
</tr>
<tr>
<td>Identify funding opportunities for postdoctoral training opportunities.</td>
<td>FY 2012</td>
</tr>
<tr>
<td>Engage faculty in grant submissions to support Assistant Research Professors</td>
<td>FY 2013;ongoing</td>
</tr>
</tbody>
</table>

D. Inputs

- Faculty
- Alumni and community supporters
- CALS development office
- UA strategic partners
- CALS financial support for faculty hires to replace lost faculty

E. Objective Metrics

- Postdoctoral training grants submitted; fellowships supported
- Donors; endowed faculty chairs
- Staff time, CALS development office
- CALS financial support for faculty hires
• Faculty hires

Notes: Nutritional Sciences is integral to the CALS “life sciences” mission and the University biomedical experience and worthy of investment. There is nothing more fundamental to health promotion, disease prevention, cognitive and physical function and quality of life than nutrition and physical activity. Our faculty conducts basic and clinical/translational research in two signature areas – cancer biology and body composition, with a strong focus on obesity and its comorbidities – with work in both biological and behavioral sciences. The relative balance across these endeavors has been disrupted by attrition and we seek to replace lost faculty and add new faculty to balance these areas and remain competitive.
EXTENSION

STRATEGIC GOAL TWELVE: Maintain and expand NSC Extension and Outreach programs in support of solutions to the state and nation’s food (food safety, food security, local foods production, food processing industries, and food service), nutrition (food choices) and the health behaviors (e.g., physical activity) related to health promotion and disease prevention.

A. Current situation and gap between current situation and desired situation
The University of Arizona, Department of Nutritional Sciences in partnership with the Arizona Nutrition Network work jointly to coordinate, administer and evaluate nutrition and physical activity initiatives throughout Arizona (SNAP-Ed, EFNEP). There are no systematic, systemic connections between the students in NSC, other CALS units, Extension and the programs in the community and industry.

B. Strategies to achieve goal
- Maintain EFNEP funds and increase SNAP-Ed and other USDA Research/Extension/Education Funding
- Increase awareness of existing Extension programs for our students
- Develop new Department of Nutritional Sciences and Extension Educational (NSC-EE) Internship programs in cooperation with College of Public Health (COPH) or county health departments. These Interns may or may not pay tuition with the possibility of securing funding/hiring after their internships as program coordinators in research or community programs.
- In addition to educational programs for students, develop community experiences, e.g., food entrepreneurial assistance, retail food safety, training assistance, and Industrial or public health wellness program in collaboration with community groups and agencies.

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain/increase SNAP-Ed funding</td>
<td>ongoing</td>
</tr>
<tr>
<td>Increase numbers of students engaged in Extension programs</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Improve Extension website in the Department and Extension websites</td>
<td>FY12-13</td>
</tr>
<tr>
<td>Develop the NSC-EE Internship</td>
<td>FY12-15</td>
</tr>
<tr>
<td>Find the resources (sponsors, budgets, etc.)</td>
<td>FY12-14</td>
</tr>
<tr>
<td>Recruit staff and Extension members for NSC-EE Internship</td>
<td>FY13-14</td>
</tr>
<tr>
<td>Recruit student interns</td>
<td>2014</td>
</tr>
<tr>
<td>Initiate NSC-EE Internship</td>
<td>Fall, 2015</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Students
- Faculty for teaching, mentoring and coordination of the internship
- Website development – web designer and web developer
- Funding from grants (e.g., SNAP-Ed)

E. Objective metrics that will be used to track progress towards attaining goal
- Number of students engaged in Extension Programs
- Number of sponsors
- Number of NSC-EE Interns
- Revenue
Plant Sciences
SCHOOL OF PLANT SCIENCES 2021 STRATEGIC PLAN

Purpose: Increase productivity and sustainability in agricultural and urban environments, especially in semi-arid and arid environments. Specifically, we will:

1. Generate fundamental knowledge about plants and their associated microbial communities at the molecular, cellular, organismal, population, and community levels.
2. Integrate basic, translational, and applied research to improve growth, development, and adaptation of crop and urban plants in varied and changing environments.
3. Disseminate our discoveries through extension and outreach activities for stakeholders locally, regionally, nationally, and internationally.
4. Combine our research with activities for undergraduate and graduate students at the University of Arizona, and beyond, to provide world-class education and training.

2021 Vision: A leadership role for the School of Plant Sciences in generating and disseminating the knowledge needed to address looming crises in productivity and sustainability of agricultural and urban plant systems in arid environments. Outcomes from fulfilling our vision will include: genetically improved plant materials, novel strategies for mitigating plant disease, improved food safety, enhanced and innovative land management strategies for optimal plant growth, and a broadly trained, job-ready workforce prepared to meet future challenges to agricultural and urban plant systems.

Mission: Achieving our vision will require us to:

- Capitalize on our research diversity.
- Develop strong communication among faculty and with stakeholders.
- Continually identify strategic opportunities in research and outreach.

Shared Values: Importance of combining and maximizing our strengths in basic and applied science to combat obstacles to agricultural production and urban plant use.

Summary: This document represents faculty-generated goals, priorities, and associated activities that will position us as leaders in meeting the challenges facing plant and microbial science in arid environments. Included are plans for strengthening our educational activities (expand/enrich undergraduate experience and success and enhance graduate education), integrating fundamental, applied, and extension research into novel strategies for our diverse stakeholders (increase research funding and productivity and meet challenges in plant and microbial science in arid environments), and a plan to broaden the scope of the School through integration of the Microbiology Program (adopt administrative responsibility for Microbiology).

All members of the SPLS faculty were given the opportunity to participate in the preparation of this document and to comment on its content. As much as is possible, the goals presented represent the general consensus of participating faculty. However, we are a diverse faculty and there is dissent and debate on aspects of this strategic vision. Alternative viewpoints will continue to be considered as faculty in the School works towards these goals.
STRATEGIC GOAL ONE: Expand/enrich Undergraduate Experience and Success

A. Current situation and gap between current situation and desired situation
The number of PLS undergraduate majors (Plant Sciences and Sustainable Plant Systems) has traditionally been low; however, it doubled from 37 to 73 in the last four years. The low number of undergraduates made individual mentoring and advising by faculty members possible. We aim to:
- Grow PLS majors while maintaining exceptional mentoring and advising.
- Prepare students for employment by offering more internship and training opportunities.
- Increase our involvement in campus-wide plant and microbial biology instruction.
- Integrate our research experience into classroom teaching.
- Provide students with a collaborative and interactive learning environment.
- Engage distant and global students with the use of online technology.

Present and target enrollment numbers:
- FY12: 73 undergraduate majors
- FY15: 100 undergraduate majors (37% increase)
- FY17: 120 undergraduate majors (20% increase)

B. Strategies to achieve goal
- Outreach to high school and community college students, and incoming freshmen.
- Promote PLS majors, career opportunities, and courses to students.
- Provide faculty mentored research for PLS undergraduates.
- Appoint a liaison to seek funding and internship opportunities in industry and government.
- Develop special activities (e.g., posters, arts, online discussions, research symposia) to promote personalized, collaborative and interactive learning.
- Create online classes that combine electronic content delivery and social media for interactions.

C. Actions

1. Regular contact with high school and community college students and advisors. Time Period: FY13-onward
2. Advertise PLS majors, careers, and courses to students via presentations and flyers. Time Period: FY13-onward
3. Promote PLS programs to University Professional Advisors. Time Period: FY13-onward
4. Mentor and advise student researchers in laboratories. Time Period: FY13-onward
5. Identify internship and practical training opportunities. Time Period: FY13-onward
6. Develop interactive online classes. Time Period: FY13-onward
7. Implement collaborative and interactive learning activities in classes. Time Period: FY13-onward

D. Inputs needed to achieve the goal
- Industry and government liaison.
- High school/community college outreach coordinator/faculty committee.
- Scholarships for summer student research (sources: grants, industry, donations, University).
- Funds for in class special projects (sources: grants, industry, donations, University).
- Video recording and editing equipment and web development for online classes.
- A part-time undergraduate advisor to assist with undergraduate advising.

E. Objective metrics that will be used to track progress towards attaining goal
- Student enrollment in PLS majors.
- Number of student credit hours.
- Number of students placed post-graduation.
- Number of presentations to biology classes and minority groups.
- Number of outreach talks.
- Number of student researchers.
- Number of interns and practical trainees.
- Number of online classes and enrollment.
A. Current situation and gap between current situation and desired situation
● FY12: 19 graduate students (+5 matriculating in fall 2012), ~0.49 graduate students/primary faculty member.
● FY16: 1 graduate student/faculty member.

B. Strategies to achieve goal
● Increase participation in umbrella and interdisciplinary graduate programs.
● Initiate and support international dual Ph.D. programs with partner institutions in the U.S. and across the globe.
● Enhance recruitment of graduate students through development of winter and summer research institutes for domestic and international students.
● Identify and expand opportunities for training corporate employees.
● Attract corporate funding for graduate studies.
● Leverage iPlant for training our graduate students.
● Train the next generation of graduate students in plant and microbial science.
● Expand teaching opportunities for PLS and PLP graduate students.
● Increase graduate funding through training grants.
● Develop fast-track M.S. and B.S.-M.S. programs in Plant Sciences and Plant Pathology.

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period</th>
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</thead>
<tbody>
<tr>
<td>1. Identify and participate in interdisciplinary graduate programs (e.g., Arizona Biological and Biomedical Sciences Program).</td>
<td>FY13-16</td>
</tr>
<tr>
<td>2. Create a dedicated Graduate Program Outreach &amp; Development Committee to carry out the actions associated with the expansion of the graduate program.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>3. Establish a dual Ph.D. program with Huazhong Agricultural University, Wuhan, China.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>4. Identify other candidate institutions in the U.S. and abroad to establish dual Ph.D. programs with special emphasis on peer institutions in the U.S. (e.g., UC Davis, Texas A&amp;M) and countries such China, India, Brazil, Russia, Mexico, and the countries in the Middle East and North Africa.</td>
<td>FY13-13</td>
</tr>
<tr>
<td>5. Develop a sustaining program funded by participating faculty member grants and CALS to provide short-term winter and summer programs/institutes to attract undergraduate students including those from liberal arts colleges and students from abroad.</td>
<td>FY14-16</td>
</tr>
<tr>
<td>6. Identify corporate collaborators for funding of our graduate program.</td>
<td>FY13-16</td>
</tr>
<tr>
<td>7. Identify opportunities and implement a long-term program of incorporating iPlant’s expertise and research as a training component of our graduate program.</td>
<td>FY13-16</td>
</tr>
<tr>
<td>8. Develop a set of online graduate courses in areas that are unique to our programs including post-harvest physiology, controlled environment agriculture, computational biology.</td>
<td>FY13-16</td>
</tr>
<tr>
<td>9. Increase outreach to existing programs at UA and other minority-serving institutions to increase recruitment of underrepresented graduate students.</td>
<td>FY13-16</td>
</tr>
<tr>
<td>10. Develop a curriculum that would enable training of our graduate students in understanding plants and microbes at a systems level, incorporating whole plant, plant-environment, and molecular/biochemical understanding of plant functions.</td>
<td>FY13-16</td>
</tr>
<tr>
<td>11. Leverage our current contribution to teaching courses outside the school (e.g., VSM, MCB, EEB) to increase the number of TA positions for those courses funded by the managing program.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>12. Identify and apply for graduate training funding from NSF, USDA, and NIH in collaboration with other units where appropriate. Areas of focus could include computational biology (iPlant), controlled environment agriculture (ABE),</td>
<td>FY13-16</td>
</tr>
</tbody>
</table>
plant/microbial systems biology (MCB, EEB), and comparative genomics (EEB).

13. Develop a 5-year combined undergraduate-graduate (B.S.-M.S.) program in Plant Sciences incorporating education and training in Plant Sciences and bioinformatics that is funded entirely through tuition fees.

14. Develop fast-track M.S. programs in Plant Sciences and Plant Pathology geared towards training scientific staff/workforce for industry, non-profit and academia funded partly or entirely through tuition fees.

D. Inputs needed to achieve the goal
- Faculty participation in additional outreach and coordination roles.
- One GRA equivalent per year in FY12 increasing to 3 per year in FY13 and beyond.
- A new Graduate Program Outreach and Development Committee as part of the larger existing Graduate Student Program Committee.
- Winter and summer training institutes coordinated by a faculty volunteers.
- Funding for undergraduate researchers from small colleges).
- Online course-development personnel funded by CALS.

E. Objective metrics that will be used to track progress towards attaining goal
- Number of graduate students matriculating per year in PLS and PLP programs.
- Number of MS and PhD degrees obtained per year in PLS and PLP programs.
- Number of graduate student credit hours.
- Amount of graduate funding from non-grant sources.
- Relationships with corporate entities.
- Relationship with small colleges and liberal arts institutions.
- Proportion of underrepresented graduate students in our school.
- Average time to completion of degree.
- Peer-reviewed graduate student publications.
- Number of online classes and enrollment.
STRATEGIC GOAL THREE: 
Adopt Administrative Responsibility for Microbiology to Expand and Diversify the Program

A. Current situation and gap between current situation and desired situation
- Microbiology is overseen by the Microbiology Commission, the Associate Dean of Academics, and the Department Heads/Directors of Veterinary Sciences and Microbiology, Plant Sciences and Soil, Water and Environmental Science. Thus, Microbiology has no single person focused full time on its oversight and no official standing committees.
- The undergraduate microbiology major is one of the largest in CALS (~300 students), one of the larger biology-based undergraduate programs in the University and one with potential to grow.
- Coordinated efforts to enhance undergraduate and graduate programs in Microbiology, adapt them to 21st century technologies and recruit students are currently limited and not faculty-based.
- There is a great need for trained microbiologists in diagnostics, food safety, quality control, environmental microbiology, bioremediation, alternative fuel production, health care and clinical laboratories.
- Many of the SPLS faculty with programs in microbial sciences work in areas unrelated to plant sciences and thus should be in an academic unit that is inclusive and covers all aspects of microbiology, recognizing it as a distinct discipline. This is necessary for having an identity that allows recruitment of graduate and undergraduate students.
- Microbiology courses are taught by faculty in several CALS departments, with a decentralized structure that separates faculty effort from faculty leadership. Four of five core courses (Microbial Diversity MIC329a, Microbial Physiology MIC328, Microbial Genetics lecture and laboratory MIC428R and L, and the largest introductory course section of MIC205, Fall semester, ~400 students) are taught by faculty in the School of Plant Sciences.
- Losses of faculty and instructors in VSM via resignations, recent and upcoming retirements, and death have resulted in a very small group of Microbiology-focused faculty in that department. In the absence of new hires, a solution is needed that leverages the strengths in Microbiology across the college.
- To best serve students and the state a strong program in Microbial Sciences must be maintained in CALS. We propose to move the Microbiology Program into the School of Plant Sciences and rename our school “The School of Plant and Microbial Sciences” (SPLMS).

B. Strategies to achieve goal
- Transition the undergraduate and graduate Microbiology programs to the School of Plant Sciences and change the School name to reflect the areas of expertise (emphasis) in the school.
- Provide interested faculty the option to transfer or apply for joint status in the SPMS.
- Establish Chairs for each of the resulting undergraduate/graduate units in the School.

C. Actions

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<tr>
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<th>Time Period</th>
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<tbody>
<tr>
<td>1. Transfer personnel for administration and advising and their support to SPLMS.</td>
<td>FY13-onward</td>
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<tr>
<td>2. Identify support resources needed for the program to measure impact on SPMS faculty and staff. We expect the transfer to be revenue neutral with current funds needed to support the program transferred to SPLMS.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>3. Allow self-identified faculty to move to or obtain joint appointments in the SPLMS.</td>
<td>FY13-14</td>
</tr>
<tr>
<td>4. Select a Chair of the Microbiology Program.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>5. Establish committees for curriculum, graduate program and related administration.</td>
<td>FY13-onward</td>
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<tr>
<td>6. Develop interactive Microbiology webpage to attract students and inform the public of the importance of UA Microbiology to human health and the environment.</td>
<td>FY13-15</td>
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</table>

D. Inputs needed to achieve the goal
- Cohesion among CALS Microbiology faculty with common goal: enhancing major and graduate program.
- Integration with Plant Sciences strategic goals.
- Migration of administrative and student support to SPLMS.
● Coordination of Microbiology and Plant Pathology graduate programs.
● Support for a Microbiology Program Chair who oversees a Microbial Sciences unit in SPLMS.

E. Objective metrics that will be used to track progress towards attaining goal
● Recognition of the name of the school as the School of Plant and Microbial Sciences (SPLMS).
● Presence of Microbiology Advisor/staff administrator located in SPLMS.
● Modification of the SPLMS website to include a Microbiology homepage and development of the Microbiology pages (Faculty, Curriculum, Career options, Students, Student club, Alumni).
● Addition of faculty to SPLMS via transfer from other departments or as joint members
● Increased student applicants and enrollees in both the undergraduate major and graduate program.
● Development of a privately sponsored cross-university Microbiology seminar series.
● Development of internship programs and corporate/private sponsorship for program enhancements.
● Increased recognition of Microbiological research excellence in CALS via coverage by the CALS website, faculty honors and student achievements.

Note. Three faculty members (of 37 with primary appointments in the School of Plant Sciences) did not support this as a strategic goal, and asked that their dissent be noted
STRATEGIC GOAL FOUR:
Increase Research Funding and Productivity

A. Current situation and gap between current situation and desired situation
- Annual averages for the past 5 years: 90 grants submitted; $9 million raised; 127 research publications.
- FY14: 120 grant submissions; $11 million in external funding; 150 research publications.
- FY17: 150 grant submissions; $14 million in external funding; 175 research publications.

B. Strategies to achieve goal (list if more than one)
- Support and strengthen research programs of current faculty.
- Increase interdisciplinary and/or intramural collaborations within the School, College, and University to enhance funding from traditional sources.
- Expand faculty efforts to obtain extramural funding from new and non-traditional sources (local, state, national, international, industry, commodity, foundations, private investors, and philanthropic organizations).

C. Actions

<table>
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<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
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<tbody>
<tr>
<td>1. Form consortia of faculty working in focused areas (such as genomics, reproductive biology, microbial ecology, etc.) to establish research collaborations for extramural funding opportunities.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>2. Establish a Fundraising Outreach Committee to identify potential donors (alumni, local, state, national, and international) to fund seminars, individual research or educational projects or endowed faculty positions.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>3. Enhance interdepartmental communication by conducting monthly faculty research meetings and annual School research retreats.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>4. Establish an Educational Outreach Committee that will plan and lead faculty educational outreach activities; these activities will be used by participants as part of research grant proposal broader impacts and/or educational grants.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>5. Develop joint seminar programs with other units in the College/University to reduce costs and promote interactions among faculty.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>6. Develop interactive Microbiology webpage to attract students and inform the public of the importance of UA Microbiology to human health and the environment.</td>
<td>FY13-onward</td>
</tr>
<tr>
<td>7. Partner with campus and professional organizations to conduct semi-annual workshops to train and educate faculty on fundraising from non-traditional sources.</td>
<td>FY13-onward</td>
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</table>

D. Inputs needed to achieve the goal (do not limit to financial inputs)
- Research consortia.
- Fundraising Outreach Committee.
- School funds, teaching assistantships.
- Educational Outreach Committee.
- Joint seminar programs.
- Funds for retreats and workshops.

E. Objective metrics that will be used to track progress towards attaining goal
- Number and dollar value of funding proposals submitted.
- Number and dollar value of funding awards granted.
- Number of School fundraising activities.
- Number of outreach and extension events and presentations at scientific meetings and extension gatherings (posters, oral).
- Number of School publications (peer-reviewed, communiqué and newsletters).
STRATEGIC GOAL FIVE:  
Meet Challenges to Plant and Microbial Science in Arid Environments

A. Current situation and gap between current situation and desired situation
World challenges relevant to agriculture and plant and microbial science include an increasing population and rapidly expanding urbanization, limited natural resources, and increasing environmental pollution. These challenges will require us to rethink how we sustainably produce food, feed, fiber, and fuel with limited water, high temperatures, and poor quality soils, while simultaneously improving plant, human, and environmental health. SPLS has high impact fundamental plant and microbial science programs, highly effective applied research and extension/outreach programs with strong stakeholder networks, and access to strong and diverse campus entities for partnering (e.g., iPlant, the Controlled Environment Agriculture Center, the Department of Veterinary Science and Microbiology, the Department of Soil, Water and Environmental Science, and the Karsten Turfgrass Research Facility). Our goal is to position ourselves as leaders in overcoming these challenges.

B. Strategies to achieve goal
- Integrate our strengths in basic, translational and applied research with our extension capacity to improve crops, crop productivity, sustainability, and the urban plantscape in semi-arid and arid agriculture.
- Develop initiatives and focused working groups to promote research collaboration.
- Develop novel uses for plants and microbes.

C. Actions

<table>
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<tr>
<th>Time Period</th>
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<tbody>
<tr>
<td>FY13-onward</td>
<td>1. Engage various stakeholders to identify research and extension initiatives and to develop a 5-year action plan.</td>
</tr>
<tr>
<td>FY13-15</td>
<td>2. Determine the feasibility of/develop a National Center for Semi-arid and Arid Plant and Microbial Sciences. Possible Center emphases include: plant breeding and transformation, computational and synthetic biology, high throughput phenotyping, urban sustainability, and cataloging arid biodiversity.</td>
</tr>
<tr>
<td>FY13-14</td>
<td>3. Identify external funding sources.</td>
</tr>
<tr>
<td>FY13-onward</td>
<td>4. Enhance our School's communication with the public</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal
- Stronger faculty participation and improved communication.
- Committees/working groups (including stakeholders) to identify and review shared priorities regularly (annually in the context of a 5-year plan).
- An operational plan for the proposed National Center for Semi-Arid and Arid Plant and Microbial Sciences.
- Grant applications to support students and research activities in relevant areas.

E. Objective metrics that will be used to track progress towards attaining goal
- Regular faculty research meetings.
- Meetings and other interactions with stakeholders and potential strategic partners.
- Identification of shared research-stakeholder priorities.
- Construction of a White Paper on feasibility of/areas of emphases for the National Center for Semi-Arid and Arid Plant and Microbial Sciences.
- Extramural funding.
- Research and extension publications in relevant areas.

Note: The faculty is in agreement that we are well positioned to meet local, national, and global challenges for plant and microbial science in arid environments. Complete agreement on specific goals and strategies proposed by a working group has not been achieved, but conversations are ongoing.
SWES 2021 STRATEGIC PLAN

SWES Purpose:
To provide knowledge, skills, tools, and awareness pertaining to environmental quality and human-environment interactions in order to improve and sustain the function of environmental systems and protect human health.

SWES 2021 Vision:
The Department of Soil, Water and Environmental Science (SWES) comprises breadth and depth of expertise in research, teaching and extension of environmental science, defined here as basic to applied science of the Earth’s terrestrial surface – including regions affected by human activity. SWES focuses on that portion of the Earth’s near surface termed the “critical zone” that extends from the lower atmospheric boundary to the lower depth of circulating groundwater, and which includes vegetation and/or urban infrastructure, soil, sediment, vadose and saturated zones. Our vision of SWES includes:

- Research, teaching and extension programs that are Land Grant mission-driven to address societal needs pertaining to problems of agricultural production, water quality, natural resource management, and environmental remediation, in a rapidly changing world.
- Programs that are natural-science-based and address direct rural, urban, and industrial systems. A departmental theme is a systems perspective that integrates fundamental concepts of physics, chemistry and biology in applications to the environment. SWES research and degree programs are therefore grounded in a strong basic science curriculum that represents the foundation for focused studies in environmental physics, chemistry and/or biology.
- A cross-section of faculty, staff and students that represent unparalleled capacity to address emerging environmental issues of local to global significance, including climate change, contaminant remediation, and the sustainable management of land and water resources. SWES personnel conduct a wide range of extramurally funded research on issues of importance, focusing especially on Arizona, the Southwest and other semi-arid and arid regions of the globe where reciprocal interactions between environmental and human health are profound.

SWES Mission:
It is our central mission to provide:

- Training and education for future generations of scientists, land and water resource managers, engineers, agricultural producers, and policy makers to address a wide range of issues facing environmental systems and their intersection with human health and well-being.
- Relevant and innovative information and communication to aid in sustainable management and decision making involving increasingly stressed land and water supplies in that state, nation and world.
- Technical expertise for addressing critical zone and environmental issues (including contaminant remediation, sustainable food production, soil and water quality) in rural and urban centers and the rapidly changing interfaces between them.

SWES Shared Values:
Critical zone science, and soil and water quality, along with their relation to human health and well-being and sustainable land and water management, will continue to be the primary focal areas for training, research, and service/extension/outreach activities of the Department.

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STRATEGIC GOAL ONE: Continue to be recognized as premiere unit in Environmental Science at the UA, nationally, and internationally.

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

There is a significant emerging need to quantify and understand human-environment interactions at local to global scales in order to maintain environmental system function and human health and well-being. Funding agencies recognize this need and increasingly support large inter- and trans-disciplinary research programs that span basic to applied, and research to education and extension program continua in order to address grand scientific and societal challenges in the areas of land, water and environmental quality and sustainability. Given our focus on land-water systems and interactions strongly impacted by human activity, SWES has the expertise and experience to lead and/or collaborate on these types of projects.

B. Strategy/ies to achieve goal (list if more than one)

1. Maintain SWES as a leader in UA-wide and multi-institutional, inter- and trans-disciplinary efforts that collectively span basic-applied-research-extension-education continua to address grand challenges in land, water and environmental quality and sustainability
2. Enhance research capacity and resource base by pursuing faculty development and funding opportunities at the intersection of environmental and human health
3. Expand SWES activities in resolving and communicating the roles of climate and land-use change, increased urbanization, and energy production on water resources, agricultural soil and water management, food safety, and environmental remediation

C. Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
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<tbody>
<tr>
<td>Develop topical research centers</td>
<td>FY13 - onward</td>
</tr>
<tr>
<td>Hire faculty in targeted areas of research and extension</td>
<td>FY15 – onward</td>
</tr>
<tr>
<td>Curriculum development in environmental science</td>
<td>FY12 – onward</td>
</tr>
<tr>
<td>Translate to broader group of stakeholders SWES activities and accomplishments</td>
<td>FY 13 – onward</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal (do not limit to financial inputs)

- Physical infrastructure for housing large project personnel, students and collaborators
- Business office function that is enabled to facilitate multi-unit projects
- Extramural and State support for cutting-edge analytical and multi-user facilities
- State support for SWES faculty replacements and hires
- Stakeholder in-reach on perceived research and extension needs

E. Objective metrics that will be used to track progress towards attaining goal

1. Number and size of large, inter- and cross-department grants
2. Publications, including for stakeholder outreach as well as in peer-reviewed journals Student numbers and success
3. Departmental ranking in Environmental Science
4. Number of stakeholder events and interactions involving faculty

Notes (if any)
STRATEGIC GOAL TWO: UA leader in the direction and provision of the Environmental Science B.S. degree program.

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

SWES was the first and only unit on campus to develop a rigorous, quantitative, and basic science based degree program in Environmental Science. SWES needs to maintain and expand its role as the leader in the direction and provision of this program.

B. Strategy/ies to achieve goal (list if more than one)
   1. Enhance pedagogy of a systems-level approach to environmental science
   2. Translate efficiently new knowledge and tools into the curriculum
   3. Provide a complement of foundational depth in parent disciplines with effective integration and applied coursework to provide an education that meets future societal demand for solutions to complex environmental problems
   4. Update and assess student outcomes, goals, and achievements in a consistent way
   5. Provide outreach to and interact with Arizona high schools and community colleges for student recruitment and curriculum coordination

C. Actions Time Period (Fiscal Years)
   • Pro-active engagement of allied units offering environmental science-related coursework (e.g., SNRE, SEES departments) FY13 - 15
   • Enable multi-unit participation in the Environmental Science major FY14 - 16
   • Enhance student recruitment activities by developing effective linkages with and/or providing assistance to school districts across Arizona FY13 - 15

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • Recognition via novel approaches to student credit hours of multi-unit participation in Environmental Science focal areas.
   • Incorporate the wealth of UA-wide activities in environmental science into an exciting, cohesive and dynamic major for UA undergraduates that exposes them to the breadth and depth of the field (as it occurs at UA like nowhere else).

E. Objective Metrics that will be used to track progress towards attaining goal
   1. Number of students enrolled in the ENVS degree program
   2. Success of undergraduates following graduation
   3. Quality of undergraduate performance

Notes (if any)
STRATEGIC GOAL THREE: Direct robust and productive Environmental Science education program for the development of the next generation of professionals and leaders.

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

SWES undergraduate and graduate programs are focused mainly on serving traditional on campus students. There is a growing opportunity to provide continuing education and/or degree programs to working professionals seeking to enhance environmental science skills. SWES is poised to directly address the needs of these non-traditional students through development of instructional programs to reach these students.

B. Strategy/ies to achieve goal (list if more than one)
   1. Enhance outreach and enrollment of non-traditional students in SWES programs
   2. Enhance interdisciplinary research and education opportunities
   3. Develop instructional structures to facilitate non-traditional student education
   4. Increase teaching efficiency by focusing certain teaching efforts on online courses

C. Actions Time Period (Fiscal Years)
   • Develop professional degree programs FY13 - 15
   • Develop online course materials FY13 - 15

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • IT and technical assistance for effective online course development (such a resource would be of benefit to units CALS-wide)
   • Effective marketing to non-traditional students of SWES expertise and curricula
   • Continued incentives to the Department for developing and offering online courses
   • Scholarship support for non-traditional students

E. Objective Metrics that will be used to track progress towards attaining goal
   1. Number and quality of students in SWES degree programs
   2. Number of non-traditional students
   3. Number of online courses and enrollment
   4. Measures of SWES graduate success following graduation

Notes (if any)
STRATEGIC GOAL FOUR: Develop departmental endowment to support at least six faculty positions and programs.

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

SWES requires strategic faculty positions to achieve the vision and objectives discussed above, where we have identified targeted programmatic areas in soil, water and environmental science that have potential to be well fundedextramurally, while also supporting the UA’s land grant mission. Given the diminishing fraction of UA’s budget provided by State of Arizona support, to facilitate development of these positions and to strengthen ties with local and national stakeholders, SWES will pursue external endowment support.

B. Strategy/ies to achieve goal (list if more than one)
   1. Cultivate relationships with key stakeholders in Arizona and the nation who recognize the importance of SWES activities in research, teaching and extension
   2. Effectively publicize the research, teaching and extension activities of SWES to expand the base of departmental support

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
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<tbody>
<tr>
<td>Identify new stakeholders served by SWES programs</td>
<td>FY 13-15</td>
</tr>
<tr>
<td>Develop enhanced public relations to publicize SWES activities</td>
<td>FY 13-15</td>
</tr>
<tr>
<td>Develop contacts and outreach to identified stakeholders</td>
<td>FY 14-16</td>
</tr>
<tr>
<td>Involve SWES alumni and friends in new department activities</td>
<td>FY 13-15</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal (do not limit to financial inputs)
   • University and college level support ensuring endowment funds procured by SWES directly support SWES

E. Objective Metrics that will be used to track progress towards attaining goal
   1. Number of endowed chair positions in SWES
   2. Amount of private funding donated to SWES
   3. Number of news and online articles written about SWES activities and research
   4. Number of stakeholders contacted for requests for potential support

Notes (if any)
Veterinary Diagnostic Laboratory
Purpose:
- To use our knowledge of laboratory diagnostics to limit the impact of animal diseases on pets, livestock, wildlife and zoological collections and on public health.

Vision:
- We will provide a broad range of veterinary diagnostic services that are cost effective, accurate and timely and meet the highest quality standards.
- We will serve public health through surveillance for zoonotic diseases.
- We will contribute to the proposed Professional Veterinary Medical Education Program through practical pathology training for professional students and to the teaching mission of the Department of Veterinary Science and Microbiology

Mission:
- Replace up to five expected faculty retirements over the next decade
- Find additional sources of revenue to replace declining state budgeted funds
- Refine and improve our Quality System to meet AAVLD accreditation standards

Shared values:
- A commitment to the Quality Assurance Program at AZVDL
- Promoting the economic viability of the livestock industry through laboratory diagnostics
- Enhancing the human animal bond through laboratory diagnostic service to practicing veterinarians.
- Making a contribution to public health through surveillance for diseases shared by humans and animals.
- Contributing to the teaching and research missions of the College
STRATEGIC GOAL ONE: Replace up to five faculty over the next ten years due to expected retirements

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation

Three AZVDL faculty members are currently eligible for retirement. Two more will be eligible within the next ten years, including the laboratory director. It will be necessary to recruit new faculty members in order to sustain the service mission of the laboratory over the next decade and beyond.

B. Strategy/ies to achieve goal (list if more than one)

Recruit up to five continuing track faculty over the next decade

C. Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Time Period (Fiscal Years)</th>
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</thead>
<tbody>
<tr>
<td>Recruit diagnostic pathologist</td>
<td>FY14</td>
</tr>
<tr>
<td>Recruit diagnostic microbiologist/diagnostician</td>
<td>FY15</td>
</tr>
<tr>
<td>Recruit diagnostic pathologist</td>
<td>FY16</td>
</tr>
<tr>
<td>Recruit diagnostic pathologist/clinical pathologist</td>
<td>FY19</td>
</tr>
<tr>
<td>Recruit diagnostic pathologist/laboratory director</td>
<td>FY21</td>
</tr>
</tbody>
</table>

D. Inputs needed to achieve the goal (do not limit to financial inputs)

Five state funded faculty lines over seven years. Salary and ERE $550,000

E. Objective metrics that will be used to track progress towards attaining goal

Number of faculty recruited in FY14-21
STRATEGIC GOAL TWO: Find additional sources of revenue to support laboratory operations

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

A. **Current situation** (i.e., problem to overcome/opportunity to capitalize on) and **gap between current situation and desired situation**.

   At present, expenses for the lab are greater than the combination of funding from fees, contracts, grants and state budgeted funds. We need to identify additional sources of revenue. The lab is understaffed at present which will making adding new tests problematic without additional resources.

B. **Strategy/ies to achieve goal** (list if more than one)

   Use client surveys to solicit suggestions for additional tests.

   Request funding for 2.0 FTE staff from CALS

C. **Actions**

   Include in our annual client survey a request for suggested new test offerings. FY 13-21

   Hire two new staff to accommodate additional test volume in lab sections and Specimen Receiving

   FY 13

D. **Inputs needed to achieve the goal** (do not limit to financial inputs)

   Construct client survey to include questions about desired new test offerings.

   Funding for additional staff to accommodate increased test volume and specimen receiving

E. **Objective Metrics that will be used to track progress towards attaining goal**

   Increased test volume

   Increased lab revenue from testing
STRATEGIC GOAL THREE: Improve our quality assurance program and meet AAVLD accreditation requirements

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

A. **Current situation** (i.e., problem to overcome/opportunity to capitalize on) and **gap between current situation and desired situation**
   - In 2012, the accreditation status of the laboratory was downgraded from full to provisional due to deficiencies in maintenance and implementation of the quality assurance program.

B. **Strategy/ies to achieve goal** (list if more than one)
   - Improve staff and faculty knowledge of the laboratory quality system and quality assurance
   - Improve record keeping for employee training, maintenance and calibration records
   - Improve audits, nonconformance/corrective actions and root cause analysis
   - Improve quality management reviews

C. **Actions**

<table>
<thead>
<tr>
<th>Action</th>
<th>Time Period (Fiscal Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hire a new Quality Manager for the laboratory</td>
<td>FY12</td>
</tr>
<tr>
<td>Hold regular staff meetings to retrain the laboratory’s quality system and discuss relevant topics in quality assurance</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Send staff and faculty to quality assurance training as it is available and resources allow</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Enlist the help of the University of Arizona Quality Assurance Officer to conduct internal audits</td>
<td>FY12-21</td>
</tr>
<tr>
<td>Purchase and install quality assurance software to help track documents and records</td>
<td>FY12</td>
</tr>
</tbody>
</table>

D. **Inputs needed to achieve the goal** (do not limit to financial inputs)
   - Laboratory funds to purchase software and travel to meetings
   - Research sources for quality assurance training

E. **Objective metrics that will be used to track progress towards attaining goal**
   - Successfully pass 2013 AAVLD accreditation site visit
   - Number of quality assurance training sessions/hours completed by staff via in house, web based or national/regional meetings.
   - Installation of quality assurance software
   - Successfully hire a new quality assurance manager

Notes (if any)
University of Arizona Water Resources Research Center (WRRC)
2021 STRATEGIC PLAN

Submitted May 18, 2012; Revised September 17, 2013

WRRC Purpose: To provide high-quality applied research, education, and outreach to improve water management and policy in water-stressed regions.

WRRC 2021 Vision: By 2021, our expanded applied research programs, increased engagement at the local, state, and broader levels, including international, and continued excellence of educational and outreach programs will cement our position as the leader in Arizona in applied water management and policy analysis.

WRRC Mission:
The WRRC promotes understanding of critical state and regional water management and policy issues through applied research, community outreach and public education.

To realize our planned 2021 vision, the WRRC is committed to:
- Building research programs that address issues of critical importance locally, regionally, and internationally, including those related to meeting the water needs of water-stressed regions with growing populations and economies.
- Maintaining excellence in water education; continuing to offer highly effective teacher education programs, K-16 water engagement, and graduate student training that grow and adapt to changing technologies and needs.
- Fully supporting the educational goals of Arizona Project Wet (APW) to develop the capacity within the K-12 school system to graduate creative and critical thinkers with the knowledge to manage local and regional natural resources and the ability to solve problems related to an interconnected, shared resource.
- Assisting local, regional, and international communities in water management and policy by continuing to foster strong, synergistic relationships with external and internal partners and stakeholders; develop new relationships and protect our reputation as a reliable and trustworthy partner.

WRRC Shared Values:
- An undiluted focus on water
- Improving water literacy within and beyond Arizona
- Sustainable water supplies for all water users, including the environment
- Supporting the resolution of real-world water challenges
- Independence, integrity, and quality
- Strong stakeholder relationships, partnerships
- Effective communication and outreach
- Innovative learning, teaching, and experiential instruction that develops creative and critical thinking skills and offers experiences outside the traditional classroom
- Paying it forward: students applying knowledge and teaching others; students becoming tomorrow’s environmental leaders
- Effective professional development of K-12 teachers
STRATEGIC GOAL ONE: To increase WRRC capacity to engage in water policy and management research that is highly relevant to the real world through increased external funding and support and recruitment of skilled faculty and staff.

Current situation and gap between current situation and desired situation.
2011: External funding of $513,000; 3 in-house faculty; 7 permanent staff
2012-2021: Increase in external funds will support additional staff positions to expand and strengthen research programs; increased numbers of visiting faculty and researchers will enhance expertise in current water issues; visiting faculty on sabbatical will be housed at WRRC

Strategy/ies to achieve goal.
- Continue strong focus on research programs that address issues of critical importance locally, regionally, and internationally, including those related to meeting the water needs of water-stressed regions with growing populations and economies
- Continue balanced contribution of WRRC programs to realize mission-specific goals of research, extension, and education
- Continue to leverage WSP/WEES funding to coordinate a strategic investment in water sustainability
- Actively participate in campus groups (e.g., UA Food Safety Consortium and efforts focused on Mexico and the Americas) to strengthen capacity for collaborative research partnerships and team grant-writing
- Utilize participation in professional and academic organizations to stay abreast of current funding opportunities and emerging issues in water management and policy
- Continue using strong stakeholder relationships to facilitate, plan, and implement research
- Maintain our federally authorized statewide role as a funding source through management of the USGS 104b and 104g programs.
- Leverage WRRC expertise in stakeholder engagement, outreach, and policy analysis to strengthen positioning for funding by agencies requesting documented outreach on research projects (NSF, NOAA, USDA, Bureau of Reclamation)
- Utilize metrics collected to demonstrate enhanced recognition that WRRC represents critical value added for University and non-University partners

Actions.
- Provide a home for visiting faculty on sabbatical whose interests mesh with those of WRRC programs (FY 2013-2021)
- Increase number of faculty collaborations through partnerships developed with research units across campus (FY 2013-2021)
- Target grant funding to continue recruitment of capable early- and mid-career professionals and talented graduate and undergraduate students (FY 2013-2021)
- Target proposals to issues of emerging concern, including agricultural water management (including food safety), water resource management for climate variability and change, environmental water needs, and international research projects that will increase external funding by 30% by 2017 and 90% by 2021, with focus on grants that pay full IDC (FY 2013-2021)
- Expand the WRRC’s leadership through WSP/WEES to facilitate cross-departmental research, seed grant project collaboration, equipment purchase, student fellowships and travel grants, and support for meetings and invited speakers (FY 2013-2016)

Inputs needed to achieve the goal.
- Shared vision among WRRC faculty, staff, and students
• Administrative assistance
• Additional professional staff, funded through grant income

Objective metrics that will be used to track progress towards attaining goal.
• Amount of grant funding received per year
• Number of faculty, faculty visitors and researchers, staff and students
• Number of projects funded on grants
• IDC received by WRRC and CALS
• Number of collaborative research and outreach activities in which WRRC is in central or support role; number of support role activities as co-lead, advisory board, advising/mentoring, or other role (See Partnerships Matrix, Appendix A)
• Percentages of activities contributing to research, education, and extension (to equal 100%) (See Partnerships Matrix, Appendix A)
STRATEGIC GOAL TWO: To increase recognition, both within and beyond the University, of the WRRC as an excellent provider of skills and knowledge for future generations of water professionals.

Current situation and gap between current situation and desired situation.
2011: 3 WRRC faculty performing teaching and student advising; support of students from Geography, Hydrology, Planning, SWES, Arid Lands Resource Sciences GIDP, and Law
2012: Implement data gathering to fully document students benefitting from WRRC programs each year 2012-2021: Increase educational impact through visiting faculty and research professionals as guest lecturers; continue strong communication and outreach of presentations by visiting lecturers to heighten exposure of WRRC programs in academic units across campus and throughout the community

Strategy/ies to achieve goal.
- Continue to support WRRC programs that encourage involvement of graduate and undergraduate students
- Continue to offer formal class instruction that is integrally connected to the WRRC Mission (e.g., Arizona Water Policy course) and related to UA certificate (e.g., Water Policy Certificate) and degree programs (e.g., M.S. in Water, Society and Policy)
- Utilize WRRC outreach materials to publicize the many industry and academic honors awarded to WRRC student assistants
- Participate in campus events targeting environmental programs

Actions.
- Seek graduate and undergraduate student support on grant applications (FY 2012-2021)
- Strengthen mentoring relationships between students and WRRC faculty and staff using in-house mentorship training program (FY 2014-2021)
- Encourage visiting faculty to offer seminars focused on current water management issues (FY 2013-2021)
- Begin email follow-up to all WRRC student alumni, to collect information on WRRC experience and on employment following graduation (FY 2012-2021)
- Implement in-house tracking program to collect student contact data from all WRRC activities (FY 2012-2021)

Inputs needed to achieve the goal.
- Shared vision among WRRC faculty, staff, and students
- Student administrative support (0.25 FTE to solicit and gather student data)
- Cooperation of WRRC student alumni

Objective metrics that will be used to track progress towards attaining goal.
- Number of undergraduate and graduate-level students mentored through WRRC programs
- Number of student committees (internal and external to CALS and UA) supported by WRRC faculty
- Number of students taught through formal instruction of classes; number of students attending guest lectures by WRRC faculty at UA and other universities
STRATEGIC GOAL THREE: Through the activities of APW, support teacher professional development, offer real-world learning experiences for K-12 students, and train community and business members to facilitate student learning.

Current situation and gap between current situation and desired situation.
2011: APW offers novel teacher development, real world experiences for students, and business involvement in education to promote college and career ready graduates who can think critically and creatively
2012-2021: APW will update and continue offering unique learning to programs to the next generation of K-12 students and teachers

Strategy/ies to achieve goal.
- Develop and deliver programs that integrate science and mathematics seamlessly and offer real-world experiences that enable students to think through complex issues
- Deliver effective teacher professional development that models best instructional practices and features embedded assessment opportunities to gauge learning
- Offer relevant field studies that target exploration and discovery as well as opportunities for students to communicate learning and take action in their lives and communities

Actions.
- Design instructional strategies that have students thinking critically and creatively about relevant natural and human resource issues, and train team members (FY 2012-2013)
- Modify project based learning modules based on realized success and lessons learned and build new teaching modules to maintain student interest (FY 2013-2014)
- Develop online learning platform to employ technology more tangibly (FY 2013-2014)
- Build capacity with teachers at schools where instructional strategies have taken hold (annually)
- Interest new businesses and community members; train adults to facilitate student learning (annually)
- Conduct formative and summative assessment of all program components (annually)
- Save millions of gallons of water through applied student learning that produces action (annually)
- Maintain statewide infrastructure with personnel, resources and equipment in 4 counties (annually)

Inputs needed to achieve the goal (fundraising is ongoing).
- Annual support for one Faculty Director ($100,000), one Program Coordinator ($60,000) and two half time Community Coordinators ($24,000) for every 20 teachers and 2000 students
- Annual cost of field experiences for 2000 students: $20,000
- Annual cost of symposia for 1000 students: $20,000
- Resources, books and equipment: $60,000
- Online learning platform development: $100,000

Objective metrics that will be used to track progress towards attaining goal.
- Number of teachers participating in 7 hours or more of professional development
- Number of teachers with an over 90% positive response rate on post-learning teacher surveys
- Number of students instructed annually by those participating teachers
- Number of students engaged in 1-hour or more of direct student outreach
• Projected water savings resulting from student application of knowledge
STRATEGIC GOAL FOUR: To enhance WRRC leadership in the dissemination of sound and independent water management and policy information and research results through increasing communication with a broad network of professional contacts around the State and beyond.

Current situation and gap between current situation and desired situation.
2011: registration to our Annual Conference, Brown Bag seminar attendees, and subscribers to publication mailing lists total ~3,500 people yearly
2021: WRRC programs reaching 5,000 people worldwide each year.

Strategy/ies to achieve goal.
- Increase visibility of WRRC outreach materials relied upon by our core constituency
- Target the use of media contacts and the new WRRC website to spread the message of our work
- Recognizing that WRRC faculty cannot accept all invitations to speak, encourage and train staff and students to engage in speaking and outreach opportunities
- Continue aggressive statewide outreach in coordination with Arizona Cooperative Extension to increase recognition of WRRC’s leadership in documentation of statewide environmental water needs
- Develop and implement a marketing plan with partners to ensure most effective delivery of WRRC message to stakeholders
- Work to maintain partnerships in all sectors (public, private, local, regional, international) to ensure delivery of WRRC products to the widest audience
- Work to establish high-visibility “branding” of WRRC products

Actions.
- Create a regular WRRC press release and university-wide email to highlight faculty, staff, and student accomplishments (FY 2012-2021)
- Enhance metrics collection system to gather additional data on attendance at outreach events (FY 2013) and gather yearly data (FY 2013-2021)
- Develop a marketing plan to enhance delivery of WRRC message using electronic media (FY 2013); implement plan (FY 2013-2021); establish video streaming of WRRC events (2014)
- Incentivize outreach collaboration in Annual Performance Review of faculty and staff (FY 2014-2021)

Inputs needed to achieve the goal.
- Support for Marketing Graduate student to aid in plan development ($5,000)
- Student assistance to track metrics and support promotion activities (each semester, @ $3,000 per semester); Administrative assistance

Objective metrics that will be used to track progress towards attaining goal.
- Number of Brown Bag seminars
- Number of Annual Conference registrations
- Number of presentations, WRRC staff, estimates of audience attendance
- Number of media contacts
- Number of subscribers to WRRC regular publications
- Number of partnerships maintained or established in each target sector, to include (among others) local, state, federal government, NGOs, tribal (See Partnerships Matrix, Appendix A)
**Appendix A: WRRC Partnerships Evaluation Matrix, September 2013**

<table>
<thead>
<tr>
<th>WRRC Activity or Program</th>
<th>Partnership Descriptors</th>
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<tbody>
<tr>
<td></td>
<td>FTE</td>
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<td></td>
<td>WRRC Staff FTE</td>
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Not every program will be reportable in all categories.

**FTE** (Orange): For each program, report WRRC Staff FTE or Student FTE (Averaged over Annual Basis). Number will range from 0.1 to 1.0 for each Staff/Student person engaged in the activity or program.

**WRRC Role** (Blue): For each program, WRRC will be **Lead** (check box) or will be in a **Support Role**. If WRRC has a support role, use appropriate number: (1) WRRC Co-Lead; (2) Advisory Board; (3) Meeting and/or Workshop Organization/Attendance; (4) Advising/Mentoring; (5) Providing Print Materials

- Metrics will be collected on: % programs in which WRRC is lead; and % programs in which WRRC has support role for each category.
Financial Leveraging (Red): Does WRRC provide monetary support or in-kind match? Does WRRC derive monetary support from the program? Report dollar amount.

Mission Focus (Green): To the best of your ability, report % Research, Education/Teaching, Extension/Outreach. Total must add up to 100%.

Partners (Purple): For this matrix, we will define “Partners” as anyone or any group who: 1) has a collaborative role in the project (helps in planning and implementation, e.g., co-authors on a grant); 2) has a supervisory/guiding role (e.g., WRRC EAC); 3) benefits from the project (e.g., middle-school students attending APW Field Days).

- Respond with numbers of partners in each partner category in appropriate boxes.
- Metrics will be collected on total outreach per year in each category.