Facilitating and Achieving Research Growth

University Council
September 12, 2005
Outline of today’s presentation

What are OVPREA’s priorities?
What does research contribute to ASU revenue?
What is ASU’s research funding track record?
What are appropriate funding growth targets?
What strategies can help achieve 25% growth?
What can OVPREA do to facilitate growth?
How do we get more administrators involved?
What are OVPREA’s priorities?
Primary OVPREA priorities

- Achieve critical mass by doubling expenditures in 3-4 years (20-25% annual growth rate)
- Recruit targeted “superstar” faculty
- Strengthen exemplar research programs (Biodesign, MacroTechnology Works, Sustainability, Decision Theater, Stardust Center, Religion & Conflict, Arts, Media & Engineering)
- **Focus here is on externally-funded areas; the same approach can apply to rest of ASU through partnering with ASU Foundation, Provosts’ Offices and Deans**
Why seek high rate of expenditure growth?

- Funding source for new initiatives and facilities
- ASU reputation hinges on these metrics
- Helps with recruiting faculty and students
- *Funding enables and reflects excellence, but doesn’t replace it*
What revenue does research contribute to ASU?
University revenues

- State Investment
- Tuition & Fees
- Total Sponsored
- Foundation Research
- TRIF
- Sales & Services
- Other Sources

ASU Facts, Fall 2004

ARIZONA STATE UNIVERSITY
RESEARCH & ECONOMIC AFFAIRS
USE INSPIRED • TRANSDISCIPLINARY • INTELLECTUAL FUSION • SOCIAL EMBEDDEDNESS
University revenues:
Research share

- State Investment
- Total Sponsored
- Tuition & Fees
- Other Sources
- Sales & Services
- Foundation Research
- TRIF

ASU Facts, Fall 2004

Arizona State University
Research & Economic Affairs
USE INSPIRED • TRANSDISCIPLINARY • INTELLECTUAL FUSION • SOCIAL EMBEDDEDNESS
In FY 2005:

Total Sponsored Expenditures: $153.0 million

Total TRIF Expenditures: $22.6 million

ASU Foundation Expenditures for Research: $7.6 million

TOTAL: $183.2 million
### Research generates and reinvests $30.3M

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>Colleges/Schools/Departments/PI's for discretionary use (20% RID + 5% IIA) + FDC/ANBC special arrangements</td>
</tr>
<tr>
<td>25%</td>
<td>Research Administration and Support (ORSPA, Animal Care, Proposal Machine, Research Publications, F&amp;A Rate Case, etc.)</td>
</tr>
<tr>
<td>12%</td>
<td>Cost Share with Colleges/Schools/Departments/PI’s</td>
</tr>
<tr>
<td>10%</td>
<td>Technology Transfer/IP/Licensing – AzTE</td>
</tr>
<tr>
<td>8%</td>
<td>General Research Support (seed funds, space, facilities, etc)</td>
</tr>
<tr>
<td>7%</td>
<td>Contributed ASU Infrastructure Support (Libraries, OGC, Purchasing, Federal Relations, Property Control, Graduate College, Tuition, Health Care, etc.)</td>
</tr>
<tr>
<td>7%</td>
<td>Start-Ups/Major Equipment Purchases/Renovations/etc.</td>
</tr>
<tr>
<td>6%</td>
<td>Strategic initiatives and TRIF backfill</td>
</tr>
</tbody>
</table>
Research generates and reinvests $30.3M

- Cost Share, 12%
- AzTE, 10%
- OVPREA, 25%
- General Research, 8%
- Contributed Infrastructure Support, 7%
- Start-up, 7%
- Strategic Initiatives, 6%
- Returned to Colleges, PIs 25%
- General Research, 8%
- Contributed Infrastructure Support, 7%
- Start-up, 7%
- Strategic Initiatives, 6%
- Returned to Colleges, PIs 25%
What are ASU’s research growth trends?
Research expenditures: Past 5 years

- **Foundation**: Red
- **TRIF**: Light purple
- **Sponsored**: Dark blue

$ Millions

- **2001**: $100
- **2002**: $120
- **2003**: $140
- **2004**: $160
- **2005**: $180


ASU Arizona State University
RESEARCH & ECONOMIC AFFAIRS
USE INSPIRED • TRANSDISCIPLINARY • INTELLECTUAL FUSION • SOCIAL EMBEDDEDNESS
Distribution of grants of different sizes

Investigator Count

2001 2002 2003 2004 2005

<= $5K
$5K- $50K
$50K- $100K
$100K- $150K
$150K- $250K
$250K- $500K
>$500K
## Distribution of grants of different sizes

<table>
<thead>
<tr>
<th>Expenditures by Investigator</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= $5K / year</td>
<td>171</td>
<td>179</td>
<td>185</td>
<td>171</td>
<td>165</td>
</tr>
<tr>
<td>$5K - $50K / year</td>
<td>312</td>
<td>326</td>
<td>333</td>
<td>333</td>
<td>360</td>
</tr>
<tr>
<td>$50K - $100K / year</td>
<td>140</td>
<td>120</td>
<td>123</td>
<td>142</td>
<td>140</td>
</tr>
<tr>
<td>$100K - $150K / year</td>
<td>77</td>
<td>81</td>
<td>71</td>
<td>86</td>
<td>99</td>
</tr>
<tr>
<td>$150K - $250K / year</td>
<td>83</td>
<td>86</td>
<td>98</td>
<td>107</td>
<td>118</td>
</tr>
<tr>
<td>$250K - $500K / year</td>
<td>61</td>
<td>100</td>
<td>104</td>
<td>103</td>
<td>116</td>
</tr>
<tr>
<td>&gt; $500K / year</td>
<td>40</td>
<td>37</td>
<td>51</td>
<td>51</td>
<td>61</td>
</tr>
<tr>
<td>Total Investigators</td>
<td>884</td>
<td>929</td>
<td>965</td>
<td>993</td>
<td>1,059</td>
</tr>
<tr>
<td>Total w/activity &gt; $5K</td>
<td>713</td>
<td>750</td>
<td>780</td>
<td>822</td>
<td>894</td>
</tr>
<tr>
<td>Total Faculty Count</td>
<td>2,055</td>
<td>2,056</td>
<td>2,071</td>
<td>2,031</td>
<td>2,022</td>
</tr>
<tr>
<td>Faculty Participation</td>
<td>43.0%</td>
<td>45.2%</td>
<td>46.6%</td>
<td>48.9%</td>
<td>52.4%</td>
</tr>
</tbody>
</table>
What are appropriate targets for ASU research funding?
ASU and other public universities: Total NSF R&D expenditures

1998-2003

Growth rate needed to reach #50 in 5 years

Expenditures (M$)

≈ 20% annual growth rate

#50 Caltech
#95 ASU
Research expenditures: Annual growth rates of 15%, 20%, 25%

Doubling in:
- 3 yrs
- 4 yrs
- 5 yrs
What strategies can help achieve 25% growth rate?
How to achieve 25% annual growth rate?

- Everyone increases by 25% (RCM to the Max!)
  BUT: not generally sustainable, not efficient, not strategic

- Differential targets: Colleges set different goals based on more detailed knowledge of opportunities—some higher than 25%

- Strategic approach—create opportunities for faster growth (Move or create national labs or state agencies, public/private partnerships with major corporations, real estate-academic projects like Biosphere & Scottsdale)

- Create institutes with more flexibility and higher expectations

- Concentrate dollars in order to accelerate rise in prestige

- Recruit superstars who already have large grant portfolios

- Increase competitiveness by filling niches
### 25% Annual growth rate by college

<table>
<thead>
<tr>
<th>COLLEGE OR VP UNIT</th>
<th>FY05 EXPENDITURES</th>
<th>FY06 25%</th>
<th>STRETCH GOAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRIBUS &amp; RESOURCE MGT</td>
<td>$688,657</td>
<td>$860,821</td>
<td>$1.0 M</td>
</tr>
<tr>
<td>EAST COLLEGE</td>
<td>$1,149,971</td>
<td>$1,437,464</td>
<td>$2.0 M</td>
</tr>
<tr>
<td>TECH &amp; APPLIED SCIENCES</td>
<td>$2,487,916</td>
<td>$3,109,895</td>
<td>$3.7 M</td>
</tr>
<tr>
<td>DESIGN</td>
<td>$570,751</td>
<td>$713,439</td>
<td>$1.0 M</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>$11,013,080</td>
<td>$13,766,350</td>
<td>$15.0 M</td>
</tr>
<tr>
<td>FINE ARTS</td>
<td>$406,088</td>
<td>$507,610</td>
<td>$0.8 M</td>
</tr>
<tr>
<td>LAW</td>
<td>$562,110</td>
<td>$702,637</td>
<td>$1.0 M</td>
</tr>
<tr>
<td>CLAS</td>
<td>$70,634,475</td>
<td>$88,293,094</td>
<td>$100.0 M</td>
</tr>
<tr>
<td>NURSING</td>
<td>$1,834,267</td>
<td>$2,292,833</td>
<td>$3.0 M</td>
</tr>
<tr>
<td>PUBLIC PROGRAMS</td>
<td>$4,474,092</td>
<td>$5,592,615</td>
<td>$6.0 M</td>
</tr>
</tbody>
</table>
## 25% Annual growth rate by college

<table>
<thead>
<tr>
<th>COLLEGE OR VP UNIT</th>
<th>FY05 EXPENDITURES</th>
<th>FY06 25%</th>
<th>STRETCH GOAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSITY COLLEGE</td>
<td>$88,286</td>
<td>$110,357</td>
<td>$0.3 M</td>
</tr>
<tr>
<td>HONORS COLLEGE</td>
<td>$3,278</td>
<td>$4,097</td>
<td>$0.2 M</td>
</tr>
<tr>
<td>BUSINESS</td>
<td>$3,724,072</td>
<td>$4,655,090</td>
<td>$6.0 M</td>
</tr>
<tr>
<td>ENGINEERING</td>
<td>$38,296,268</td>
<td>$47,870,336</td>
<td>$55.0 M</td>
</tr>
<tr>
<td>GLOBAL MANAGEMENT/LEADERSHIP</td>
<td>$134,589</td>
<td>$168,237</td>
<td>$0.4 M</td>
</tr>
<tr>
<td>HUMAN SERVICES</td>
<td>$545,936</td>
<td>$682,420</td>
<td>$1.0 M</td>
</tr>
<tr>
<td>INTERDISC ARTS &amp; SCIENCES</td>
<td>$330,430</td>
<td>$413,037</td>
<td>$0.6 M</td>
</tr>
<tr>
<td>TEACHER EDUCATION</td>
<td>$1,622,055</td>
<td>$2,027,569</td>
<td>$3.0 M</td>
</tr>
<tr>
<td></td>
<td><strong>$153,016,176</strong></td>
<td><strong>$191,270,221</strong></td>
<td><strong>$200.0M</strong></td>
</tr>
</tbody>
</table>
## $50M growth: Hiring-related options

<table>
<thead>
<tr>
<th>Option</th>
<th>Growth Potential</th>
<th>#needed for $50M</th>
<th>Comments</th>
<th>Likely in FY06</th>
<th>Likely Growth</th>
<th>Possible #</th>
<th>Possible Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAE/NAS “Superstar” Faculty</td>
<td>$2M</td>
<td>25</td>
<td>Difficult to hire &gt;4-5 per year; lack of contiguous space to attract senior hires; need add’l 250,000 s.f. research space</td>
<td>3</td>
<td>$6M</td>
<td>5</td>
<td>$10M</td>
</tr>
<tr>
<td>High Performers/ Potential NAS/NAE Faculty</td>
<td>$1M</td>
<td>50</td>
<td>See above</td>
<td>3</td>
<td>$3M</td>
<td>6</td>
<td>$6M</td>
</tr>
<tr>
<td>Mid-Career Faculty Hires</td>
<td>$.5M</td>
<td>100</td>
<td>Would need 250,000 s.f. more research space</td>
<td>10</td>
<td>$5M</td>
<td>16</td>
<td>$8M</td>
</tr>
<tr>
<td>Junior Faculty Hires</td>
<td>$.02M</td>
<td>250</td>
<td>Would need 250,000 s.f. more research space</td>
<td>30</td>
<td>$6M</td>
<td>45</td>
<td>$9M</td>
</tr>
<tr>
<td>Soft Money Research Lines</td>
<td>$.25M</td>
<td>200</td>
<td>Need transition funds to go to full soft-money support</td>
<td>30</td>
<td>$7.5M</td>
<td>40</td>
<td>$10M</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$28M</td>
<td></td>
<td>$43M</td>
</tr>
</tbody>
</table>
### $50M growth: Options related to maturing of current researchers

<table>
<thead>
<tr>
<th>Option</th>
<th>Growth Potential</th>
<th># needed for $50M</th>
<th>Comments</th>
<th>Likely in FY06</th>
<th>Likely Growth</th>
<th>Possible in FY06</th>
<th>Possible Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Junior and Senior Faculty Increasing Research Productivity by $200K/ea.</td>
<td>$.02M</td>
<td>250</td>
<td>Represents &gt; 10% of the current research faculty and almost 100% of the researchers with current expenditures &gt; $150K</td>
<td>10</td>
<td>$2M</td>
<td>20</td>
<td>$4M</td>
</tr>
<tr>
<td>Increased Productivity from Faculty with low/no expenditures</td>
<td>$.0025M</td>
<td>2,000</td>
<td>There are only about 1000 faculty lines</td>
<td>200</td>
<td>$5M</td>
<td>400</td>
<td>$10M</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$7M</td>
<td></td>
<td>$14M</td>
</tr>
</tbody>
</table>
$50M growth: Less traditional grant routes

<table>
<thead>
<tr>
<th>Option</th>
<th>Growth Potential</th>
<th># needed for $50M</th>
<th>Comments</th>
<th>Likely in FY06</th>
<th>Likely Growth</th>
<th>Possible in FY06</th>
<th>Possible Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Partnerships LLC-like relationships</td>
<td>$2M</td>
<td>25</td>
<td>Unlikely to manage/fund many relationships; currently funding SPLLC for social science/workforce opportunities – discussions have taken place about possible international leads</td>
<td>4</td>
<td>$8M</td>
<td>8</td>
<td>$16M</td>
</tr>
</tbody>
</table>
## $50M growth: Options related to competitive grant opportunities

<table>
<thead>
<tr>
<th>Option</th>
<th>Growth Potential</th>
<th>#needed for $50M</th>
<th>Comments</th>
<th>Likely in FY06</th>
<th>Likely Growth</th>
<th>Possible in FY06</th>
<th>Possible Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Grant Opportunities (FDC size)</td>
<td>$7.5M</td>
<td>7</td>
<td>Limited number opportunities each year</td>
<td>1</td>
<td>$7.5M</td>
<td>2</td>
<td>$15M</td>
</tr>
<tr>
<td>Medium-Large Grant Opportunities (ERC size)</td>
<td>$4M</td>
<td>13</td>
<td>Limited number opportunities each year</td>
<td>2</td>
<td>$8M</td>
<td>3</td>
<td>$12M</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$15.5M</td>
<td></td>
<td>$27M</td>
</tr>
<tr>
<td>Option</td>
<td>Growth Potential</td>
<td># needed for $50M</td>
<td>Comments</td>
<td>Likely in FY06</td>
<td>Likely Growth</td>
<td>Possible in FY06</td>
<td>Possible Growth</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------------</td>
<td>------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Acquisition of federal research labs (e.g., Warfighter Training Lab)</td>
<td>$40M</td>
<td>1</td>
<td>Currently in play through BRAC comment process—beyond Warfighter Training Lab, not clear what the opportunities are</td>
<td>0</td>
<td>$0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporation of State Agency within ASU</td>
<td>$25M</td>
<td>2</td>
<td>Requires political maneuvering; other state universities are home to state and federal agencies</td>
<td>0</td>
<td>$0M</td>
<td>1</td>
<td>$1M</td>
</tr>
<tr>
<td>ASU Foundation/Philanthropic Grants Provide Research Revenue Investment</td>
<td>$1M</td>
<td>50</td>
<td>Recent history has been very good (FSE, IIS, Piper)</td>
<td>2</td>
<td>$2M</td>
<td>4</td>
<td>$4M</td>
</tr>
<tr>
<td>Invest in other initiatives of magnitude similar to Biodesign</td>
<td>$10M</td>
<td>5</td>
<td>Resources currently directed to Biodesign; would need other resource streams in the near term</td>
<td>0</td>
<td>$0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$2M</td>
<td>$5M</td>
<td></td>
</tr>
</tbody>
</table>
### Good bets for FY06

<table>
<thead>
<tr>
<th>Funding Source/ ASU Initiative</th>
<th>Growth Potential FY05</th>
<th>Comments &amp; assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Probability of Success for FY06</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRIF</td>
<td>$2M</td>
<td>Assumes 7% growth rate + strong economy</td>
</tr>
<tr>
<td>Biodesign</td>
<td>$5M</td>
<td>New faculty still coming up to speed, new grants beginning</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>$2M</td>
<td>Investment in Strategic Partnerships LLC will pay off</td>
</tr>
<tr>
<td>“Organic Growth”</td>
<td>$7M</td>
<td>Non-stimulated growth based on FY04-05 change</td>
</tr>
<tr>
<td>PSERC (NSF)</td>
<td>$2M</td>
<td>ASU chosen to be lead institution (Vittal/Heydt)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$18M</strong></td>
<td></td>
</tr>
</tbody>
</table>
What can OVPREA do to facilitate research growth?
Tools and steps OVPREA can contribute to expand research and creative activity

- Better connect websites and messages
- Provide publicity through Research Publications office
- Help integrate different administrative levels
- Link researchers to Federal Relations offices
- Manage and improve “Community of Science”
- Executive Information Services (“Dashboard”)
- Proposal Machine
- Enhanced Administrative & Research Services (EARS)
Tools and steps OVPREA can contribute to expand research and creative activity

- Invest in research areas with high growth potential
- Seed fund initiatives like humanities research, Piper Creative Writing Center, Center for Religion and Conflict, ConnectionOne
- Connect faculty with Economic Affairs team
- Organize specialized consultant support services
Online Tracking/Report Card System

- Executive Information System: https://eis.vprc.asu.edu/
- Two web-based tools accessible from the same web site:
  - Pre-Set Graphical Presentation (Executive Dashboard)
  - Excel Compatible Data-Cube (Data Analyst Tables)
- Data is updated every night
- Accessible to all with an ASURITE ID
- Initial implementation in process of expansion
- Provides Chairs, Deans and Provost with objective measures for assessing research progress
Online Tracking/Report Card System

Executive Information System Reports (EIS)

The EIS data structure supports rapid reporting of aggregate data. This structure delivers rapid comparison and analysis of up-to-date data across multiple dimensions.

The initial set of reports generated by the EIS contains proposal, award and expenditure data by University, College, Department, and Investigator. Reports on other dimensions will be added throughout FY06.

Executive dashboard

- Proposals
- Awards
- Expenditures

Data analyst tables

- Proposal Cube
- Award Cube
- Expenditure Cube

Period: [All Data]  College: COLLEGE OF LIBERAL ARTS

Sponsored Project Expenditures
Total Expenditures, Fiscal Years, and Fiscal Quarters

- University
- College
- Department
- Researcher

ASU Arizona State University
Research & Economic Affairs
“Proposal Machine”

- Proposal Machine launched in FY05
- Assists faculty groups in preparation of major proposals
- Proposals:
  - John Crittenden’s NSF ERC on Urban CyberInfrastructure
  - Rick Shangraw’s DHS Catastrophic Events Center
  - USAF Warfighter Training Center proposal
- Headed by Ken Davis, former Motorola senior manager
OVPREA helps fill interdisciplinary niches

- Environmental economics
- Personal power systems
- Human-machine interfaces of all types
- Sustainable energy sources
- Sensing networks at all scales
- Urban system resiliency
- Integrated nano-bio-cogno devices
- Health care delivery networks/systems
- Devices for operation in extreme environments
- Workforce issues
Enhanced Administrative and Research Services Program (EARS)

- Designed for researchers with most complex portfolios
- Goal is to reduce administrative red tape
- Helps OVPREA identify problem areas earlier
- Has buy-in from principal VP areas
- Gives P.I. single contact point to resolve admin issues
- Criteria: # different awards, total grant dollars, interdisciplinarity, # large proposals applied for, availability of other administrative support
- Not intended to be a reward for professional achievement or standing
How do we get broader buy-in?

- Faculty report to Chairs who report to Deans who report to Provost who reports to President
- VPR not in that chain
- *Research goals must be a priority for all*
Main obstacle to achieving growth

Consultant

“There was one very important thing about your quest that we couldn’t discuss...” said King Azaz.

“I remember” said Milo eagerly. “Tell me now.”

“It was impossible,” said the king, looking at the Mathemagician.

“Completely impossible,” said the Mathemagician, looking at the king. “If we’d told you then, you might not have gone—and, as you’ve discovered, so many things are possible just as long as you don’t know they’re impossible.”