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**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)  
ANNUAL REPORT**

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**ARIZONA BOARD OF REGENTS**

**Arizona State University  
Northern Arizona University  
The University of Arizona**

**For the fiscal year ended June 30, 2007,  
as required by A.R.S. §15-1648(D).**

**September 1, 2007**



Arizona Board of Regents  
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Arizona State University

Northern Arizona University

University of Arizona

September 1, 2007

Governor Janet Napolitano  
Senate President Tim Bee  
Speaker of the House of Representatives James Weiers  
Arizona State Capitol  
1700 West Washington Street  
Phoenix, AZ 85007

Dear Governor Napolitano, President Bee, and Speaker Weiers:

On behalf of the Arizona Board of Regents, Arizona State University, Northern Arizona University, and The University of Arizona, and in accordance with A.R.S. §15-1648(D), I am pleased to submit this Annual Report for the Arizona Board of Regents Technology and Research Initiative Fund (TRIF) for the fiscal year ended June 30, 2007. TRIF is continuously appropriated to the Arizona Board of Regents with Education 2000 (Proposition 301/November 2000) sales tax revenues pursuant to A.R.S. §42-5029(E)(2).

As required, ABOR has adopted rules to administer TRIF and has incorporated these rules into Board Policy 3-412 found in the appendix to this report.

This Annual Report provides budget and expenditure information on each TRIF initiative. These initiatives are consistent with statutory language calling for TRIF funds to support university research, development, and technology transfer related to the knowledge-based global economy; to expand access to baccalaureate or post-baccalaureate education for time- and place-bound students; to implement recommendations of the Governor's Task Force on Higher Education and the Arizona Partnership for the New Economy; and to develop programs that will prepare students to contribute in high technology industries located in Arizona.

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*Board Members:* **President Fred T. Boice**, Tucson    **Robert B. Bulla**, Scottsdale    **Ernest Calderón**, Phoenix  
**Dennis DeConcini**, Tucson    **Fred P. DuVal**, Phoenix    **Anne L. Mariucci**, Phoenix  
**Christina A. Palacios**, Phoenix    **Gary L. Stuart**, Phoenix  
**Governor Janet Napolitano**    **Superintendent of Public Instruction Tom Horne**  
*Student Regents:* **Mary Venezia**, NAU    **David Martinez III**, UA  
*Executive Director:* **Joel Sideman**

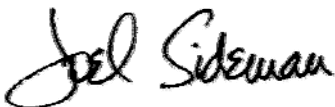
Governor Napolitano, President Bee, Speaker Weiers  
September 1, 2007  
Page Two

Our FY 2007 TRIF budget supported development of The University of Arizona College of Medicine-Phoenix, in partnership with Arizona State University, on the Phoenix Biomedical Campus; other initiatives in biosciences and biotechnology; information science and technology; access and workforce development, including Arizona Universities Network (AZUN) and preparation of math and science teachers; and optical sciences, water sustainability, and environmental research and development. These projects have been designed and implemented to better position Arizona as a major player in the global marketplace. Detailed business plans for each initiative have been developed and approved by the Arizona Board of Regents and are available on our website at: [www.azregents.edu](http://www.azregents.edu)

We believe that you will find the project brochures included in this report helpful and informative. They provide a snapshot of each TRIF-funded initiative, including performance measures and metrics, financial information, and project management and advisory boards.

Please contact me at 602-229-2505 or [jsideman@asu.edu](mailto:jsideman@asu.edu) if I can answer any questions or provide additional information about these important and exciting initiatives.

Sincerely,

A handwritten signature in black ink that reads "Joel Sideman". The signature is written in a cursive, flowing style.

Joel Sideman  
Executive Director

c: The Honorable Jan Brewer, Secretary of State  
Ms. GladysAnn Wells, Director, Arizona State Library, Archives and Public Records  
Members of the Arizona Board of Regents  
Dr. Michael Crow, President, Arizona State University  
Dr. John Haeger, President, Northern Arizona University  
Dr. Robert Shelton, President, The University of Arizona

**ARIZONA BOARD OF REGENTS  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
ANNUAL REPORT  
For the fiscal year ended June 30, 2007**

**EXECUTIVE SUMMARY**

- ▶ Education 2000 (Proposition 301), passed by Arizona voters in November 2000, approved a 0.6 percent increase in the state sales tax rate to be dedicated to the universities, the community colleges, and K-12. Collection of the tax began on June 1, 2001.
- ▶ A.R.S. §15-1648 establishes the Technology and Research Initiative Fund (TRIF) to receive Proposition 301 revenue and gives the Arizona Board of Regents the authority to administer the fund. As of June 30, 2007, \$337,348,304 in revenue from Proposition 301 has been received into TRIF.
- ▶ In March 2007 the Arizona Board of Regents approved a five-year TRIF budget plan for FY 2007-2011. The Board annually approves a revised budget and detailed performance measures for each initiative.
- ▶ A.R.S. §15-1648(D) requires the Board to submit to the Governor and the Legislature by September 1 of each year a report to include “a description of the amount and duration of each new award distributed and a description of the purpose and goals for each award. For existing awards, the Arizona Board of Regents shall use a detailed set of performance measures to determine the overall effectiveness of each award.”
- ▶ Detailed business plans for each initiative have been developed by the universities and central office and are available on the Arizona Board of Regents web site at: [www.azregents.edu](http://www.azregents.edu) Project brochures fully describing each project have also been developed and are included in this Annual Report and are also available on the Arizona Board of Regents web site.
- ▶ Actual TRIF revenue received during FY 2007 totaled \$72,047,372.
- ▶ Actual TRIF expenditures in FY 2007 totaled \$77,279,899, representing 74% of total available revenue (including carryforward amounts from the prior year). Recognizing the timing under which these revenues flow to the Arizona Board of Regents from the Arizona State Treasurer’s Office, that is, on a monthly basis and even after fiscal year end, this expenditure rate is not unexpected. In addition, FY 2006 revenue in excess of budgeted amount was allocated to the universities in October 2006 (FY 2007) after Board approval of expenditure plans, thus resulting in larger carryforward amounts into FY 2007 than usual.

- ▶ Recognizing the volatility and unpredictability of the TRIF revenue stream, the universities and central office exercised sound budgetary and financial management in the expenditure of TRIF funds throughout FY 2007.
- ▶ TRIF budget guidelines adopted by the Board call for full expenditure of FY 2007 funds by December 31, 2007. The universities and central office may then request that any unexpended funds be reallocated for the same or a different use. Such requests are anticipated due to the larger-than-usual carryforward amounts into FY 2007.
- ▶ Expenditure detail by university and central office and by initiative is presented in this report. For the second year, TRIF project brochures are included in this Annual Report, presenting in a concise format a description of each TRIF-funded project, project goals, performance analysis, financial information, management and advisory boards, and contact information to “Learn More” about each project.
- ▶ Detailed performance measures for evaluating individual initiatives were approved by the Board, as required by statute. Performance measures and outcomes have been compiled by each university and the central office for each TRIF initiative and, as mentioned above, are included in the project brochures.
- ▶ This report reflects the statutorily required funding for costs of Certificates of Participation (COPs) issued for the lease-purchase of buildings and associated infrastructure at Arizona State University at the Polytechnic campus and Arizona State University at the West campus.
- ▶ This report reflects compliance with the 20% statutory limitation on use of TRIF funds for capital projects. In FY 2007, 16.8% of TRIF expenditures were for capital projects.
- ▶ This FY 2007 TRIF Annual Report is available on the Arizona Board of Regents website at: [www.azregents.edu](http://www.azregents.edu)

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**ARIZONA BOARD OF REGENTS  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF) ANNUAL REPORT**

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**For the Fiscal Year Ended June 30, 2007**

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**ARIZONA UNIVERSITY SYSTEM  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 ACTUAL / FY 2008 - 2011 BUDGETS  
SUMMARY**

	FY 2007 REVISED BUDGET	FY 2007 ACTUAL	FY 2008 REVISED BUDGET	FY 2009 BUDGET	FY 2010 BUDGET	FY 2011 BUDGET
<b>REVENUE</b>						
Carryforward	\$ 32,465,192	\$ 32,465,192	\$ 27,183,678	\$ 2,070,021	\$ -	\$ -
TRIF Revenue	71,829,966	71,829,973	74,261,754	78,568,644	82,032,652	86,136,383
<b>TOTAL REVENUE</b>	<b>\$ 104,295,158</b>	<b>\$ 104,295,165</b>	<b>\$ 101,445,432</b>	<b>\$ 80,638,665</b>	<b>\$ 82,032,652</b>	<b>\$ 86,136,383</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services	\$ 35,881,869	\$ 27,614,103	\$ 37,036,232	\$ 30,693,953	\$ 32,069,252	\$ 33,745,328
ERE	9,788,338	7,601,951	9,910,318	7,963,954	8,342,049	8,806,184
All Other Operating	24,326,806	21,839,355	24,485,946	17,059,551	17,934,478	19,014,943
Grants/Projects	5,709,120	1,812,640	8,092,660	4,253,750	4,336,438	4,423,260
<b>TOTAL OPERATING BUDGET</b>	<b>75,706,133</b>	<b>58,868,049</b>	<b>79,525,156</b>	<b>59,971,208</b>	<b>62,682,217</b>	<b>65,989,715</b>
<b>CAPITAL BUDGET</b>						
Building Renovation	3,289,107	209,107	3,529,200	3,394,100	3,260,500	3,507,400
Debt Service	12,382,431	10,232,130	8,702,144	9,069,656	9,826,082	10,236,232
ASU Polytechnic/West COPs	3,791,000	3,650,200	3,751,800	3,748,800	3,747,800	3,748,600
NAU Conference Center	2,000,000	2,000,000	-	-	-	-
<b>TOTAL CAPITAL BUDGET</b>	<b>21,462,538</b>	<b>16,091,437</b>	<b>15,983,144</b>	<b>16,212,556</b>	<b>16,834,382</b>	<b>17,492,232</b>
<b>EXPENDITURES TOTAL</b>	<b>97,168,671</b>	<b>74,959,486</b>	<b>95,508,300</b>	<b>76,183,764</b>	<b>79,516,599</b>	<b>83,481,947</b>
<b>AZUN</b>	<b>4,058,332</b>	<b>2,320,413</b>	<b>3,128,634</b>	<b>4,454,901</b>	<b>2,516,053</b>	<b>2,654,436</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 101,227,003</b>	<b>\$ 77,279,899</b>	<b>\$ 98,636,934</b>	<b>\$ 80,638,665</b>	<b>\$ 82,032,652</b>	<b>\$ 86,136,383</b>
<b>SUMMARY BY PROGRAM AREA</b>						
Access/Workforce Development/e-Learning	\$ 22,965,213	\$ 15,381,548	\$ 23,346,058	\$ 18,640,174	\$ 16,815,574	\$ 17,256,199
Biodesign/BIO5/GBI	38,514,515	33,945,331	34,304,735	30,497,792	31,727,992	33,205,092
Biomedical and Health Sciences	6,250,500	1,420,186	7,900,314	3,500,000	3,400,000	3,550,000
Environmental	7,303,314	5,441,769	8,471,752	5,430,081	5,624,959	5,661,874
Infrastructure	16,091,462	15,421,210	11,862,388	14,815,991	16,626,812	18,539,081
Optical Sciences	3,782,078	3,187,607	4,350,138	3,275,667	3,275,667	3,275,667
Regents Innovation Fund	2,386,125	1,265,329	2,694,286	1,653,750	1,736,438	1,823,260
TRIF Strategic Investments (TSI)	2,934,048	250,000	4,849,224	2,000,000	2,000,000	2,000,000
Technology Transfer	999,748	966,919	858,039	825,210	825,210	825,210
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 101,227,003</b>	<b>\$ 77,279,899</b>	<b>\$ 98,636,934</b>	<b>\$ 80,638,665</b>	<b>\$ 82,032,652</b>	<b>\$ 86,136,383</b>

**ARIZONA UNIVERSITY SYSTEM  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 BUDGET / ACTUAL  
SUMMARY BY PROGRAM AREA**

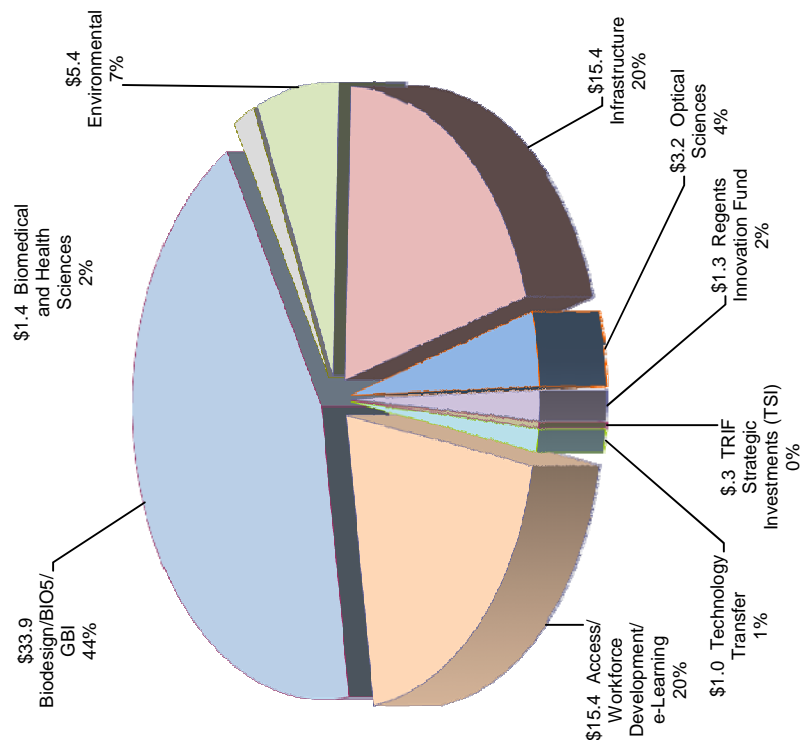
	FY 2007 REVISED BUDGET	FY 2007 ACTUAL
<b>REVENUE</b>		
Carryforward	\$ 29,349,379	\$ 29,349,379
TRIF Revenue	69,687,261	69,687,268
<b>TOTAL REVENUE</b>	<b>\$ 99,036,640</b>	<b>\$ 99,036,647</b>

<b>EXPENDITURES</b>		
<b>OPERATING BUDGET</b>		
Personal Services	\$ 35,881,869	\$ 27,614,103
ERE	9,788,338	7,601,951
All Other Operating Grants/Projects	24,326,806	21,839,355
	5,709,120	1,812,640
<b>TOTAL OPERATING BUDGET</b>	<b>75,706,133</b>	<b>58,868,049</b>
<b>CAPITAL BUDGET</b>		
Building Renovation	3,289,107	209,107
Debt Service	12,382,431	10,232,130
ASU Polytechnic/West COPs	3,791,000	3,650,200
NAU Conference Center	2,000,000	2,000,000
<b>TOTAL CAPITAL BUDGET</b>	<b>21,462,538</b>	<b>16,091,437</b>

<b>EXPENDITURES TOTAL</b>	<b>97,168,671</b>	<b>74,959,486</b>
<b>AZUN</b>	<b>4,058,332</b>	<b>2,320,413</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 101,227,003</b>	<b>\$ 77,279,899</b>

<b>SUMMARY BY PROGRAM AREA</b>		
Access/Workforce Development/e-Learning	\$ 22,965,213	\$ 15,381,548
Biodesign/BIO5/GBI	38,514,515	33,945,331
Biomedical and Health Sciences	6,250,500	1,420,186
Environmental	7,303,314	5,441,769
Infrastructure	16,091,462	15,421,210
Optical Sciences	3,782,078	3,187,607
Regents Innovation Fund	2,386,125	1,265,329
TRIF Strategic Investments (TSI)	2,934,048	250,000
Technology Transfer	999,748	966,919
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 101,227,003</b>	<b>\$ 77,279,899</b>

**FY 2007 SYSTEM ACTUAL TRIF EXPENDITURES  
(in millions)**



**ARIZONA UNIVERSITY SYSTEM  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 ACTUAL / FY 2008 BUDGET CAPITAL EXPENDITURES  
(\$ in thousands)**

TRIF INITIATIVE		FY 2007 Revised Budget	FY 2007 Actual	FY 2008 Budget
ASU	• Research: <i>Biodesign Institute at ASU</i>	\$3,900	\$818	\$4,059
	• ASU Poly/West COPs*	n/a	n/a	n/a
	<b>Total Capital</b>	<b>\$3,900</b>	<b>\$818</b>	<b>\$4,059</b>
	<b>Capital as % of Total ASU Budget</b>	<b>15.0%</b>	<b>4.1%</b>	<b>20.5%</b>
NAU	• Access/Workforce Development:	\$4,921	\$4,071	\$2,185
	<i>Access/Workforce Development</i>	\$2,071	\$2,071	\$2,185
	<i>University Initiatives (Conference Center)</i>	\$2,000	\$2,000	\$0
	<i>Statewide Expansion</i>	\$850	\$0	\$0
	• Research:	\$3,160	\$2,918	\$0
	<i>Capital Projects</i>	\$2,662	\$2,662	\$0
	<i>University Initiatives (Other)</i>	\$498	\$256	\$0
	<b>Total Capital</b>	<b>\$8,081</b>	<b>\$6,990</b>	<b>\$2,185</b>
<b>Capital as % of Total NAU Budget</b>	<b>32.7%</b>	<b>37.2%</b>	<b>10.2%</b>	
UA	• Research:	\$5,690	\$4,634	\$5,987
	<i>ACTREC</i>	\$100	\$0	\$0
	<i>BIO5 Institute</i>	\$169	\$169	\$350
	<i>Critical Core Infrastructure</i>	\$4,281	\$3,400	\$4,497
	<i>Expansion of Phoenix Biomedical Campus</i>	\$1,140	\$1,065	\$1,140
	<b>Total Capital</b>	<b>\$5,690</b>	<b>\$4,634</b>	<b>\$5,987</b>
	<b>Capital as % of Total UA Budget</b>	<b>17.7%</b>	<b>18.8%</b>	<b>17.5%</b>
ABOR	<b>Total Capital</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
	<b>Capital as % of Total ABOR Budget</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>
SYSTEM	• Access/Workforce Development	\$4,921	\$4,071	\$2,185
	• Research	\$12,750	\$8,370	\$10,046
<b>Total System Capital</b>		<b>\$17,672</b>	<b>\$12,441</b>	<b>\$12,231</b>
<b>20% Statutory Limit on Capital</b>		<b>\$19,487</b>	<b>\$14,834</b>	<b>\$18,869</b>
<b>Capital as % of Total System Budget</b>		<b>18.1%</b>	<b>16.8%</b>	<b>13.0%</b>

\* Not applicable. TRIF allocations for ASU Polytechnic and ASU West debt service (FY 2007 actual of \$3.7 million) are directed by statute. Therefore, these amounts are excluded from both the calculation of the total system capital and the 20% statutory limitation on capital expenditures.

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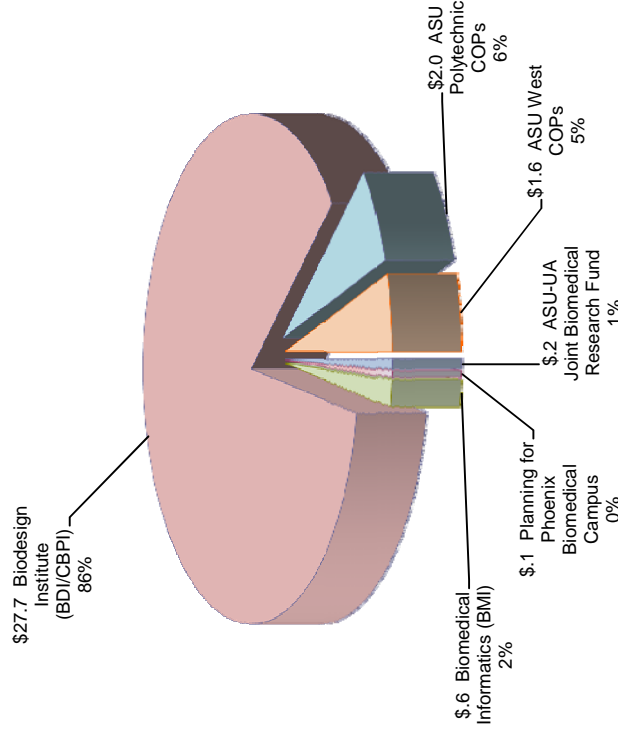
**ARIZONA STATE UNIVERSITY**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
**FY 2007 ACTUAL / FY 2008 - 2011 BUDGETS**  
**SUMMARY**

	<b>FY 2007 REVISED BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 REVISED BUDGET</b>	<b>FY 2009 BUDGET</b>	<b>FY 2010 BUDGET</b>	<b>FY 2011 BUDGET</b>
<b>REVENUE</b>						
Carryforward	\$ 11,111,300	\$ 11,111,300	\$ 5,872,900	\$ -	\$ -	\$ -
TRIF Revenue	27,041,400	27,041,400	28,087,200	29,744,900	30,974,100	32,452,000
<b>TOTAL REVENUE</b>	<b>\$ 38,152,700</b>	<b>\$ 38,152,700</b>	<b>\$ 33,960,100</b>	<b>\$ 29,744,900</b>	<b>\$ 30,974,100</b>	<b>\$ 32,452,000</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services	\$ 14,919,900	\$ 13,276,700	\$ 12,274,700	\$ 11,227,600	\$ 11,711,200	\$ 12,284,100
ERE	3,385,200	3,368,900	2,744,200	2,496,000	2,607,000	2,738,900
All Other Operating	12,156,400	11,166,300	11,130,100	7,998,300	8,398,800	8,923,100
<b>TOTAL OPERATING BUDGET</b>	<b>30,461,500</b>	<b>27,811,900</b>	<b>26,149,000</b>	<b>21,721,900</b>	<b>22,717,000</b>	<b>23,946,100</b>
<b>CAPITAL BUDGET</b>						
Building Renovation	3,020,100	40,100	3,179,200	3,394,100	3,260,500	3,507,400
Debt Service	880,100	777,600	880,100	880,100	1,248,800	1,249,900
COPs Lease Purchase Payment	3,791,000	3,650,200	3,751,800	3,748,800	3,747,800	3,748,600
<b>TOTAL CAPITAL BUDGET</b>	<b>7,691,200</b>	<b>4,467,900</b>	<b>7,811,100</b>	<b>8,023,000</b>	<b>8,257,100</b>	<b>8,505,900</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 38,152,700</b>	<b>\$ 32,279,800</b>	<b>\$ 33,960,100</b>	<b>\$ 29,744,900</b>	<b>\$ 30,974,100</b>	<b>\$ 32,452,000</b>
<b>SUMMARY BY INITIATIVE</b>						
ASU-UA Joint Biomedical Research Fund	\$ 1,000,000	\$ 210,700	\$ 1,289,300	\$ 500,000	\$ 500,000	\$ 500,000
Planning for Phoenix Biomedical Campus	750,000	133,200	616,800	-	-	-
Biomedical Informatics (BMI)	2,000,000	551,200	2,448,800	1,000,000	1,000,000	1,000,000
Biodesign Institute (BD/CBPI)	30,611,700	27,734,500	25,853,400	24,496,100	25,726,300	27,203,400
ASU Polytechnic COPs	2,123,000	2,046,100	2,082,800	2,084,200	2,083,800	2,081,600
ASU West COPs	1,668,000	1,604,100	1,669,000	1,664,600	1,664,000	1,667,000
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 38,152,700</b>	<b>\$ 32,279,800</b>	<b>\$ 33,960,100</b>	<b>\$ 29,744,900</b>	<b>\$ 30,974,100</b>	<b>\$ 32,452,000</b>

**ARIZONA STATE UNIVERSITY**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
**FY 2007 BUDGET / ACTUAL**  
**SUMMARY BY PROGRAM AREA**

	FY 2007 REVISED BUDGET	FY 2007 ACTUAL
<b>REVENUE</b>		
Carryforward	\$ 11,111,300	\$ 11,111,300
TRIF Revenue	27,041,400	27,041,400
<b>TOTAL REVENUE</b>	<b>\$ 38,152,700</b>	<b>\$ 38,152,700</b>
<b>EXPENDITURES</b>		
<b>OPERATING BUDGET</b>		
Personal Services	\$ 14,919,900	\$ 13,276,700
ERE	3,385,200	3,368,900
All Other Operating	12,156,400	11,166,300
<b>TOTAL OPERATING BUDGET</b>	<b>30,461,500</b>	<b>27,811,900</b>
<b>CAPITAL BUDGET</b>		
Building Renovation	3,020,100	40,100
Debt Service	880,100	777,600
COPs Lease Purchase Payment	3,791,000	3,650,200
<b>TOTAL CAPITAL BUDGET</b>	<b>7,691,200</b>	<b>4,467,900</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 38,152,700</b>	<b>\$ 32,279,800</b>
<b>SUMMARY BY INITIATIVE</b>		
ASU-UA Joint Biomedical Research Fund	\$ 1,000,000	\$ 210,700
Planning for Phoenix Biomedical Campus	750,000	133,200
Biomedical Informatics (BMI)	2,000,000	551,200
Biodesign Institute (BDI/CBPI)	30,611,700	27,734,500
ASU Polytechnic COPs	2,123,000	2,046,100
ASU West COPs	1,668,000	1,604,100
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 38,152,700</b>	<b>\$ 32,279,800</b>

**FY 2007 ASU ACTUAL TRIF EXPENDITURES**  
(in millions)



REPORT FOR THE FISCAL YEAR ENDING  
JUNE 30, 2007

TECHNOLOGY AND RESEARCH  
INITIATIVE FUND (TRIF)



*The Biodesign Institute (top) includes laboratories (below) that are designed to enhance communication and collaboration.*



The Biodesign Institute at Arizona State University is ASU's flagship TRIF initiative focusing on use-inspired, collaborative research to improve human health and the quality of life. The research agenda emphasizes translation (the application of discoveries to commercial uses and societal benefits) and impact (the quest for effective innovation). To accelerate the pace of discovery, the Biodesign Institute merges formerly distinct fields of research, including biology, chemistry, physics, medicine, agriculture, environmental science, electronics, materials science, engineering and computing.

ASU has also made complementary strategic investments in capacity building project areas such as information technology, wireless communications, materials and technology transfer to advance faculty groups and provide support functions for research that demonstrates promise for high impact economic development and projected future integration with the major Biodesign Institute initiatives.

The Department of Biomedical Informatics was established in 2005 within the School of Computing and Informatics at Arizona State University and began receiving TRIF funds in FY 2007. Biomedical Informatics is playing an important role in expanding the understanding of disease prevention and treatment and improving patient care through realizing the vision of personalized medicine. Their mission is to prepare individuals to make major contributions to the creation and evaluation of computational and informatics tools and their application to biomedical and clinical research, health care practice, public health and education of health professionals and patients.

Also beginning in FY 2007, TRIF supports the Joint ASU-UA Biomedical Research Fund in providing combined ASU-UA TRIF resources for collaborative university and other organizational biomedical projects. In addition, one time funding in FY 2007 is helping accelerate planning for the Arizona Biomedical Collaborative 2 and the Medical Education buildings as part of the Phoenix Biomedical Campus.

TRIF also provides annual debt service funding for ASU Polytechnic and ASU West infrastructure and campus improvement projects, including multiple building renovations and a laboratory/computer classroom building.

## ASU TRIF PROGRAM

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Dr. Rick Shangraw  
Vice President for  
Research and Economic  
Affairs



# CONSOLIDATED PERFORMANCE ANALYSIS

PERFORMANCE MEASURES/DELIVERABLES	FY02		FY03		FY04		FY05		FY06		FY07		FY08		FY09		FY10		FY11		
	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	
<b>PERFORMANCE MEASURES/DELIVERABLES</b>																					
<b>BioDesign Institute and Capacity Building Project Investments</b>																					
<b>Return on Investment</b> (\$ amounts in millions)																					
Federal and non-federal awards	11.15	11.92	11.70	8.63	13.50	27.09	34.53	35.88	43.00	47.00	51.60	52.09	56.76	62.44	66.68	75.55					
Royalty/income											0.50	0.48	0.52	0.55	0.57	0.60					
Foundation funding											0.47	0.57	0.50	0.52	0.55	0.57					
<b>Return Total</b>											52.57	53.14	57.78	63.50	69.80	76.73					
Value of new startups to ASU	06	05	12	09	24	140	220	253	300	38											
New products in marketplace	2	5	3	3	4	5	8	10	10	7											
Value of new products to ASU	12	42	42	40	50	140	220	253	300	38											
<b>Technology Transfer</b>																					
New invention disclosures	15	97	27	91	109	98	120	166	144	152	145	158	147	148	150	151					
New patent applications filed	22	108	8	106	117	128	140	168	154	82	156	140	157	159	160	162					
New patents issued	3	11	2	17	20	18	20	41	20	22	20	15	20	21	21	21					
Total start-up companies licensing ASU technology	2	3	1	3	3	4	4	4	4	4	4	4	4	4	4	4					
Licenses or options signed (as indication of technology adoption by industry)	2	9	3	20	24	24	28	28	32	32	32	22	33	33	33	34					
New software packages distributed	1	-	2	6	8	10	15	2	N/A	N/A											
Form industry/university nationwide research consortium	-	-	x	In Progress	x	4	2	2	2	N/A											
Create research road map in collaboration with industry	x	In Progress	Completed	Completed	-	4	1	4	N/A												
Fund proof of concept grants to faculty	5	6	5	6	6	5	11	6	6	6											
Business plans written	2	2	3	6	3	9	10	8	11	2											
Technology transfer portal inquiries from industry	5	1	10	13	15	15	20	15	15	27											
<b>Work Force Contributions</b>																					
Post-doctoral appointments	20	5	5	48	10	44	32	64	37	88	37	56	38	38	39	39					
Post-doctoral researchers leaving to enter the workforce	-	-	-	19	8	24	24	32	26	39	26	26	27	27	27	27					
Graduate students employed	10	29	45	120	50	106	101	121	112	103	113	324	114	115	117	118					
Graduate students earning degrees and entering the workforce	-	-	-	33	20	67	67	63	74	71	75	95	75	76	77	78					
Undergraduate students involved	32	39	50	84	60	139	139	177	170	160	172	157	173	175	177	179					
Increase in number of teachers who graduate with math/science certification	50	9	10	-	15	7	25	(14)	8	7											
Growth in CS/ISE Graduates	20	-21	40	10	60	37	40	53	50	30											
<b>Partnerships/Collaborations</b>																					
The number of BioDesign Institute research grants/contracts involving funding from non-government entities											17	25	17	17	18	18					
The number of BioDesign Institute research grants/contracts involving subcontracts to non-ASU researchers											18	35	18	18	19	19					
New research collaborations with industry and national laboratories	8	9	7	13	10	19	19	14	26	49											
<b>Curriculum Innovations</b>																					
Per 1 Introduction to Information Technology for all students - Completed FY 2008	x	Completed																			
Per 2 package of 3 courses	x	Partially				Partially		Partially						Partially							
Per 3 concentration for BS degrees			x	Partially		Partially		Partially						Partially							
BS Applied Computing (ASU vies) Begins Fall 2005	25	Approved																			
High school students completing software design material	30	88	30	227	75	200	75	-	N/A	N/A											
Internships w/ industry	30	32	40	88	90	136	128	71	75	50											
New courses introduced (Bio, Info, Nano)	4	4	6	6	4	16	18	13	24	5											
<b>Economic Development</b>																					
Companies identifying ASU as a factor for relocating or expanding in AZ	1 large 2 small	2 large 3 small	1 large 3 small	0 large 2 small	1 large 2 small	1 large 3 small	1 large 3 small	7 large 3 small	4 large 4 small	3 large 4 small											
<b>Biomedical Informatics</b>																					
<b>Return on Investment</b> (\$ amounts in millions)																					
Federal and non-federal awards											0.80	1.76	2.00	2.83	4.71	6.10					
Royalty/income											0.02	0.00	0.02	0.03	0.03	0.04					
Foundation funding											0.03	0.00	0.04	0.04	0.05	0.06					
<b>Return Total</b>											0.85	1.76	2.06	2.90	4.80	6.20					
<b>Economic Impact</b>																					
BMI tenure-track faculty hired by the Department [FTE]											2	2	7	11	14	16					
BMI research faculty hired by the Department [FTE]											3	3	4	6	7	8					
New invention disclosures and patent applications filed											N/A	N/A	3	5	8	10					
Total start-up companies licensing ASU technology											N/A	N/A	N/A	1	2	3					
<b>Work Force Contributions</b>																					
Graduate students earning concentrations in BMI											10	Begin Fall 07	10	10	20	20					
Graduate students earning masters degrees in BMI											N/A	N/A	10	20	30	40					
Graduate students earning doctoral degrees in BMI											N/A	N/A	N/A	5	10	15					
Undergraduate students earning concentrations in BMI											N/A	N/A	N/A	N/A	20	30					
Medical students trained in informatics											N/A	N/A	N/A	24	48	72	96				
<b>Partnerships/Collaborations</b>																					
Number of partnerships with biomedical providers											4	6	8	12	14	16					
Number of partnerships with industry											2	1	4	8	12	15					
<b>Joint ASU/AZ Biomedical Research Fund</b>																					
<b>Return on Investment</b> (\$ amounts in millions)																					
Federal and non-federal awards											N/A	N/A	1.25	1.25	1.25	1.25					
Royalty/income											N/A	N/A	N/A	N/A	N/A	N/A					
Foundation funding											N/A	N/A	N/A	N/A	N/A	N/A					
<b>Return Total</b>											0.00	0.00	1.25	1.25	1.25	1.25					

## EXPLANATION OF PERFORMANCE ANALYSIS

- The FY07-FY11 **Return on Investment** measures include federal and non-federal awards, royalty income and foundation funding. The sum of these three components (the **Return Total**) is then divided by the related TRIF expenditures for the fiscal year to arrive at the **Return on Investment** ratios included in the financial table below. For the initial five year TRIF funding period FY02-FY06, the return on investment was 1.7:1. FY02-FY06 ROI calculations do not include royalty income and foundation funding.
- **Technology Transfer** measures provide results for ASU's newly structured technology transfer initiative, Arizona Technology Enterprises (AzTE). Measures for inventions, patents and licensing activity are included. The Biodesign Institute provides a primary focus for AzTE as it facilitates the development of intellectual property, promotes industrial linkages, drives technology marketing, and accelerates the successful transition of ASU discoveries into the marketplace.
- **Workforce Contributions** measures show the impact of TRIF funding and research participation by undergraduate students, graduate students, and post-doctoral appointments in the Biodesign Institute and Biomedical Informatics. The measures also include the number of graduate students and post-doctoral researchers leaving ASU to enter the workforce.
- **Partnerships/Collaborations** are an important component for growth of the Biodesign Institute and BMI. Increasing involvement with non-ASU researchers such as the Mayo Clinic, Barrows Neurological Institute, the Translational Genomics Research Institute and the University of Arizona College of Medicine provides additional opportunities to expand and enhance ASU research in the biomedical areas.
- **Curriculum Innovations and Economic Development** measures, along with selected measures in the other categories, were used for the first TRIF funding cycle (FY02 - FY06). For the second funding cycle (FY07 - FY11), several of these measures were no longer applicable or were replaced with more current and meaningful measures.



*The Department of Biomedical Informatics is located in the Arizona Biomedical Collaborative building (left) in downtown Phoenix and on the Tempe campus in the Brickyard building in Downtown Tempe.*

## FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Rev Budget	FY07 Actual	FY08 Rev Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>ASU CONSOLIDATED TRIF FINANCIAL SCHEDULE</b>											
<b>Biodesign Institute &amp; Capacity Building Project Investments</b>											
Revenue	\$15,217,000	\$25,242,500	\$21,220,700	\$27,210,100	\$26,555,300	\$30,611,700	\$30,611,700	\$25,853,400	\$24,496,100	\$25,726,300	\$27,203,400
Expenditures	4,825,100	20,134,300	12,703,500	18,854,800	19,764,100	30,611,700	27,734,500	25,853,400	24,496,100	25,726,300	27,203,400
Return On Investment	2.5:1	0.4:1	2.1:1	1.9:1	2.4:1	1.7:1	1.9:1	2.2:1	2.6:1	2.7:1	2.8:1
<b>Biomedical Informatics</b>											
Revenue						2,000,000	2,000,000	2,448,800	1,000,000	1,000,000	1,000,000
Expenditures						2,000,000	551,200	2,448,800	1,000,000	1,000,000	1,000,000
Return on Investment						0.4:1	3.2:1	0.8:1	2.9:1	4.8:1	6.2:1
<b>ASU-UA Joint Biomedical Research Fund</b>											
Revenue						1,000,000	1,000,000	1,289,300	500,000	500,000	500,000
Expenditures						1,000,000	210,700	1,289,300	500,000	500,000	500,000
Return on Investment						N/A	N/A	2.5:1	2.5:1	2.5:1	2.5:1
<b>ABC &amp; Phoenix Biomedical Campus Planning</b>											
Revenue						750,000	750,000	616,800			
Expenditures						750,000	133,200	616,800			
<b>ASU Polytechnic &amp; ASU West Certificates of Participation (COPS)</b>											
Revenue	2,500,000	6,100,000	3,572,000	3,815,800	3,781,700	3,791,000	3,791,000	3,751,800	3,748,800	3,747,800	3,748,600
Expenditures	-	6,128,000	3,356,200	3,708,500	3,790,300	3,791,000	3,650,200	3,751,800	3,748,800	3,747,800	3,748,600
<b>Grand Total</b>											
Revenue	17,717,000	31,342,500	24,792,700	31,025,900	30,337,000	38,152,700	38,152,700	33,960,100	29,744,900	30,974,100	32,452,000
Expenditures	4,825,100	26,262,300	16,059,700	22,563,300	23,554,400	38,152,700	32,279,800	33,960,100	29,744,900	30,974,100	32,452,000

Note: FY 2007 Carry Forward amounts include FY 2006 TRIF revenue in excess of budget ("Over-Realized Revenue") received by ABOR in FY 2006 but not allocated to the universities until October 2006 (FY 2007). Because of necessary planning time required by the universities, not all funds were expended in FY 2006.



The Polytechnic campus Student Union (above left) provides a central meeting place for students. TRIF funds have provided for campus infrastructure improvements at both ASUP and ASUW. The West campus Classroom Laboratory / Computer Classroom Building II (above right) provides much needed instructional space, science and computer labs.

## GOALS & RESULTS

The ASU strategic decision to invest its TRIF allocation in the biosciences and supporting technology areas resulted in the formation of the Biodesign Institute and the strategic selection of complementary capacity-building projects for funding. The recently added Biomedical Informatics initiative is part of an emerging scientific discipline that deals with the storage, retrieval, sharing and optimal use of biomedical information, data, and knowledge for problem solving and decision making. The study of biomedical informatics is interdisciplinary, drawing upon many diverse fields including medicine, genetics, biology, engineering, computing and information sciences.

### Goals:

- Increase the governmental and private funding of research connected with the Biodesign Institute.
- Increase the rate of technology transfer and commercial development coming from the bioscience/biotechnology/biomedicine areas.
- Enhance interdisciplinary collaborative research in nanotechnology and advanced materials.
- Focus on use-inspired research that will result in demonstrable improvements in patient care and biomedical research.
- Train a new generation of physicians and other health care professionals facile in biomedical computing.

### Indicative Results:

- FY07 TRIF related Biodesign and Capacity Building Project federal and non-federal awards increased to \$52M, an 11% increase over FY06.

## GOALS & RESULTS (CONT)

- MacroTechnology Works (MTW) was formed to leverage ASU's investment in the \$44M/5-year Army Flexible Display Center grant and facility. MTW provides a vehicle to take new discoveries rapidly to the prototype production phase and works closely with ASU's TRIF initiatives.
- Master's degree in BMI was approved by ABOR in June 2006 and the BMI concentration was approved by the ASU Graduate College in December 2006.
- The ASU-UA Joint Biomedical Research Fund has awarded \$2M in collaborative grants for FY07.

## MANAGEMENT

### OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC AFFAIRS

**Rick Shangraw:** Vice President for Research and Economic Affairs

**Stephen Goodnick:** Associate Vice President for Research

### THE BIODESIGN INSTITUTE

**George Poste:** Director, the Biodesign Institute and Del E. Webb Distinguished Professor of Biology

### BIOMEDICAL INFORMATICS

**Vimla L. Patel:** Professor and Interim Chair, Department of Biomedical Informatics

## ADVISORY BOARDS

The Biodesign Institute and the Department of Biomedical Informatics (BMI) have both established advisory boards that include nationally and internationally renowned industry and academic members. These groups provide an extensive breadth of knowledge, experience and advice to the initiatives.

## LEARN MORE

Office of the Vice President for Research and Economic Affairs

480.965.1225

<http://ovprea.asu.edu/>

The Biodesign Institute

480.727.0370

<http://www.biodesign.asu.edu>

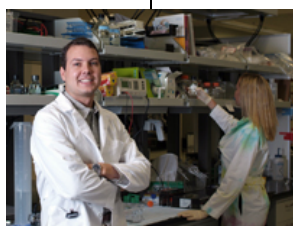
Department of Biomedical Informatics

480.727.7747

<http://bmi.asu.edu>



# ARIZONA STATE UNIVERSITY TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)



*The Institute's interdisciplinary research engages diverse capabilities including directed self assembly of macromolecules (top) and pulsed laser analysis of bioenergy transfer processes (middle).*

*John Chaput, asst. professor at the Biodesign Institute, has used molecular biology tricks to rapidly evolve proteins that have improved stability when compared to naturally occurring proteins (bottom).*

## THE biodesign INSTITUTE

ARIZONA STATE UNIVERSITY

The Biodesign Institute at Arizona State University is ASU's flagship TRIF initiative, and focuses on research that meets urgent societal needs for improved human health and the quality of life.

Today's scientific discoveries are increasingly dependent on large, interdisciplinary teams working together to solve a well-defined problem. In 2007, the Biodesign Institute reorganized around four strategic research themes to maximize collaborations across Biodesign, ASU and affiliated institutions.

Our **Global Public Health** initiative focuses on outpacing the world's most virulent infectious diseases through improved vaccines and rapid methods for disease detection. **Personalized Medicine** identifies the unique signatures to diseases such as cancer to provide early detection and aid the discovery of new preventions and cures. **Energy and the Environment** efforts secures alternative, bio-inspired sources of energy and bioremediation systems. The Institute is also developing new sensors and monitoring technologies to mitigate possible biological, chemical and radioactive threats and thereby **Secure a Safer World**.

These complex challenges require bold thinkers with both specialized expertise and a broader understanding of solving problems as a member of a team. Success hinges on the convergence of new technologies from vastly different fields of science, and translating these discoveries to commercial uses for societal benefit.

Complementary investments in capacity building project areas support research that demonstrates promise for high impact economic development and future integration with the major Biodesign Institute initiatives.

### REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2007

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Dr. George Poste  
Director, The Biodesign Institute  
& Del E. Webb Distinguished  
Professor of Biology



# PERFORMANCE ANALYSIS

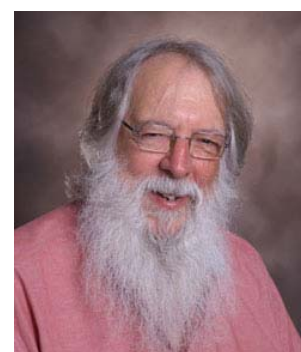
PERFORMANCE MEASURES/DELIVERABLES	FY02	FY02	FY03	FY03	FY04	FY04	FY05	FY05	FY06	FY06	FY07	FY07	FY08	FY08	FY09	FY09	FY10	FY10	FY11	FY11
	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj
<b>Return on Investment</b> (\$ amounts in millions)																				
Federal and non-federal awards	11.15	11.92	11.70	8.63	13.50	27.09	34.53	35.88	43.00	47.00	51.60	52.09	56.76	62.44	68.68	75.55				
Royalty/income																				
Foundation funding																				
<b>Return Total</b>																				
Value of new startups to ASU	.06	.05	.12	.09	.24	1.40	2.20	2.53	3.00	3.8										
New products in marketplace	2	5	3	3	4	5	8	10	10	7										
Value of new products to ASU	.12	.42	.42	.40	.50	1.40	2.20	2.53	3.00	3.8										
<b>Technology Transfer</b>																				
New invention disclosures	15	97	27	91	109	98	120	166	144	152	145	158	147	148	150	151				
New patent applications filed	22	108	8	106	117	128	140	168	154	82	156	140	157	159	160	162				
New patents issued	3	11	2	17	20	18	20	41	20	22	20	15	20	21	21	21				
Total start-up companies licensing ASU technology	2	3	1	3	3	4	4	4	4	4	4	7	4	4	4	4				
Licenses or options signed (as indication of technology adoption by industry)	2	9	3	20	24	24	28	28	32	32	32	22	33	33	33	34				
New software packages distributed	1	-	2	6	8	10	15	2	N/A	N/A										
Form industry-university nationwide research consortium	-	-	x	In Progress	x	4	2	2	2	N/A										
Create research road map in collaboration with industry	x	In Progress	Completed	Completed	-	4	4	1	4	N/A										
Fund proof of concept grants to faculty	5	6	5	6	6	5	14	9	11	6										
Business plans written	2	2	3	6	3	9	10	8	11	2										
Technology transfer portal inquiries from industry	5	1	10	13	15	15	15	20	15	27										
<b>Work Force Contributions</b>																				
Post-doctoral appointments	20	5	5	48	10	44	32	64	37	88	37	56	38	38	39	39				
Post-doctoral researchers leaving to enter the workforce	-	-	-	19	8	24	24	32	26	39	26	26	27	27	27	27				
Graduate students employed	10	29	45	120	50	106	101	121	112	103	113	324	114	115	117	118				
Graduate students earning degrees and entering the workforce	-	-	-	33	20	67	67	63	74	71	75	95	75	76	77	78				
Undergraduate students involved	32	39	50	84	60	139	139	177	170	160	172	157	173	175	177	179				
Increase in number of teachers who graduate with math/science certification	50	9	10	-	15	7	25	(14)	8	7										
Growth in CS/CSE Graduates	20	-21	40	10	60	37	40	53	50	30										
<b>Partnerships/Collaborations</b>																				
The number of Biodesign Institute research grants/contracts involving funding from non-government entities																				
The number of Biodesign Institute research grants/contracts involving subcontracts to non-ASU researchers																				
New research collaborations with industry and national laboratories	8	9	7	13	10	19	19	14	26	49	17	25	17	17	18	18				
<b>Curriculum Innovations</b>																				
Tier 1 Introduction to Information Technology for all students - Completed FY 2002	x	Completed																		
Tier 2 package of 3 courses	x	Partially				Partially		Partially												
Tier 3 concentration for BIS degree			x	Partially		Partially		Partially												
BIS Applied Computing (ASU West) Begins Fall 2005		Approved	x						x											
High school students completing software design material	25	88	30	227	75	200	75	-	N/A	N/A										
Internships w/industry	30	32	40	88	90	136	128	71	75	50										
New courses introduced (Bio, Info, Nano)	4	4	6	6	4	16	18	13	24	5										
<b>Economic Development</b>																				
Companies identifying ASU as a factor for relocating or expanding in AZ	1 large 2 small	2 large	1 large 3 small	0 large 2 small	1 large 2 small	1 large 3 small	1 large 3 small	7 large 3 small	4 large 4 small	3 large 4 small										

Note: The above amounts include the Biodesign Institute and capacity building project investments.

## EXPLANATION OF PERFORMANCE ANALYSIS

- The FY07-FY11 **Return on Investment** measures include federal and non-federal awards, royalty income and foundation funding for Biodesign and capacity building project investments. The sum of these three components (the **Return Total**) is then divided by the related TRIF expenditures for the fiscal year to arrive at the **Return on Investment** ratio included in the financial table below. For the initial five year TRIF funding period FY02-FY06, the cumulative return on investment was 1.7:1. FY02-FY06 ROI calculations do not include royalty income and foundation funding.
- **Technology Transfer** measures provide results for ASU's technology transfer initiative, Arizona Technology Enterprises (AzTE). Measures for inventions, patents and licensing activity are included. AzTE facilitates the development of ASU's intellectual property, promotes industrial linkages, drives technology marketing, and accelerates the successful transition of ASU discoveries into the marketplace.
- **Workforce Contributions** measures show the impact of TRIF funding and research participation by undergraduate students, graduate students, and post-doctoral appointments within the TRIF projects. The measures also include the number of graduate students and post-doctoral researchers leaving ASU to enter the workforce.
- **Partnerships/Collaborations** are an important component for growth of the Biodesign Institute and capacity building project initiatives. Increasing involvement with non-government and non-ASU researchers such as the Mayo Clinic, TGen and Barrows Neurological Institute provides additional opportunities to expand and enhance ASU research.
- **Curriculum Innovations and Economic Development** measures, along with selected measures in the other categories, were used for the first TRIF funding cycle (FY02 - FY06). For the second funding cycle (FY07 - FY11), several of these measures were no longer applicable or were replaced with more current and meaningful measures.

*Dr. Roy Curtiss of ASU's Biodesign Institute, was named "Bioscience Researcher of the Year" at the third annual Excellence in Bioscience Awards Dinner, held recently and sponsored by the Arizona BioIndustry Association.*



## FINANCIALS

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Rev Budget	FY07 Actual	FY08 Rev Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward	\$ -	\$ 10,391,900	\$ 5,108,200	\$ 8,517,200	\$ 8,355,300	\$ 8,869,900	\$ 8,869,900	\$ 2,877,200			
New TRIF Revenue	15,217,000	14,850,600	16,112,500	18,692,900	18,200,000	21,741,800	21,741,800	22,976,200	24,496,100	25,726,300	27,203,400
<b>TOTAL REVENUE</b>	<b>\$15,217,000</b>	<b>\$25,242,500</b>	<b>\$21,220,700</b>	<b>\$27,210,100</b>	<b>\$26,555,300</b>	<b>\$30,611,700</b>	<b>\$30,611,700</b>	<b>\$25,853,400</b>	<b>\$24,496,100</b>	<b>\$25,726,300</b>	<b>\$27,203,400</b>
<b>OPERATING BUDGET</b>											
Personal Services	\$ 1,492,100	\$ 5,907,800	\$ 7,120,900	\$ 9,136,400	\$ 9,500,300	\$ 13,505,400	\$ 13,147,900	\$ 10,930,900	\$ 10,324,500	\$ 10,807,400	\$ 11,379,800
Employee Related Expenses	221,700	938,900	1,386,700	2,048,700	2,207,300	3,078,900	3,334,300	2,500,600	2,374,700	2,485,600	2,617,400
All Other Operating Expenses	2,150,700	10,760,500	3,853,700	6,994,000	7,464,300	10,127,200	10,434,600	8,362,600	7,522,700	7,924,000	8,448,900
<b>Total Operating Budget</b>	<b>3,864,500</b>	<b>17,607,200</b>	<b>12,361,300</b>	<b>18,179,100</b>	<b>19,171,900</b>	<b>26,711,500</b>	<b>26,916,800</b>	<b>21,794,100</b>	<b>20,221,900</b>	<b>21,217,000</b>	<b>22,446,100</b>
<b>CAPITAL BUDGET</b>											
Building Renovation	960,600	2,527,100	342,200	675,700	592,200	3,020,100	40,100	3,179,200	3,394,100	3,260,500	3,507,400
Debt Service						880,100	777,600	880,100	880,100	1,248,800	1,249,900
<b>Total Capital Budget</b>	<b>960,600</b>	<b>2,527,100</b>	<b>342,200</b>	<b>675,700</b>	<b>592,200</b>	<b>3,900,200</b>	<b>817,700</b>	<b>4,059,300</b>	<b>4,274,200</b>	<b>4,509,300</b>	<b>4,757,300</b>
<b>TOTAL EXPENDITURES</b>	<b>\$4,825,100</b>	<b>\$20,134,300</b>	<b>\$12,703,500</b>	<b>\$18,854,800</b>	<b>\$19,764,100</b>	<b>\$30,611,700</b>	<b>\$27,734,500</b>	<b>\$25,853,400</b>	<b>\$24,496,100</b>	<b>\$25,726,300</b>	<b>\$27,203,400</b>
<b>Return On Investment</b>	<b>2.5:1</b>	<b>0.4:1</b>	<b>2.1:1</b>	<b>1.9:1</b>	<b>2.4:1</b>	<b>1.7:1</b>	<b>1.9:1</b>	<b>2.2:1</b>	<b>2.6:1</b>	<b>2.7:1</b>	<b>2.8:1</b>

Note: The above amounts include the Biodesign Institute and capacity building project investments. FY 2007 Carry Forward amounts include FY 2006 TRIF revenue in excess of budget ("Over-Realized Revenue") received by ABOR in FY 2006 but not allocated to the universities until October 2006 (FY 2007). Because of necessary planning time required by the universities, not all funds were expended in FY 2006.

## GOALS & RESULTS

ASU has invested its TRIF allocation in a select number of highly-integrated science and technology projects to ensure the critical mass and focus that will produce results. Because the Biodesign Institute is the cornerstone of funding, the goals/results below primarily focus on the Institute. However, other capacity building projects, including the Institute for Computing and Information Sciences (InCISE), the Decision Theater, Wireless Integrated Nano Technology (WINTech) and Advanced Materials are included in the financial and performance metrics.

### Goals:

- Increase the governmental and private funding of research connected with the Biodesign Institute by 25 percent annually
- Increase the rate of technology transfer and commercial development coming from the bioscience/biotechnology/biomedicine areas
- Identify opportunities where recent IT developments can enable the successful growth of novel transdisciplinary areas of research
- Enhance interdisciplinary collaborative research in nanotechnology and advanced materials

### Indicative Results:

- In FY07, Biodesign recruited 2 senior faculty, 26 post doctoral research scholars, 5 research faculty and 8 research scientists. Total staffing now approximates 600.
- Drs. Michael Rosenberg and Jieping Ye of Biodesign received \$1.2 million from NSF to develop technology to help manage the burgeoning biological data pool.
- Dr. Bertram Jacobs of Biodesign was named Innovator of the Year for Academia at the 2006 Governor's Celebration of Innovation for contribution to the development of safer vaccines for diseases such as small pox and AIDS.
- Dr. Stephen Albert Johnston, Innovations in Medicine, received a \$7.5 million Innovator Award from Dept. of Defense for a vaccine against breast cancer
- Dr. Sudhir Kumar, Director, Evolutionary Functional Genomics, was named a 2006 Promotion and Tenure Exemplar by President Crow.
- Dr. Charles Arntzen, Infectious Diseases and Vaccinology, received the Centennial Award from the Botanical Society of America for contribution to the advancement of plant sciences.
- Dr. George Poste, Director, Biodesign Institute, received 2006 Albert Einstein Award for advancing human health worldwide.
- With the contribution of TRIF investments in Materials related activity, ASU's Electrical Engineering graduate program ranking improved to 26th in the U.S.

## MANAGEMENT

### OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC AFFAIRS

**Rick Shangraw:** Vice President for Research and Economic Affairs

**Stephen Goodnick:** Associate Vice President for Research

### THE BIODESIGN INSTITUTE

**George Poste:** Director, the Biodesign Institute and Del E. Webb Distinguished Professor of Biology

**Michael Tracy:** Deputy Director

## BIODESIGN INSTITUTE ADVISORY BOARD

★ = National Academy Member

⊛ = Nobel Laureate

### Chairman:

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### Members:

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- ★ **Dr. Lucy Shapiro**, Director, Beckman Center for Molecular and Genetic Medicine; Ludwig Professor of Cancer Research — Stanford University School of Medicine
- ★ **Dr. James Wells**, President and CSO — Sunesis Pharmaceuticals

## LEARN MORE

Office of the Vice President for Research and Economic Affairs

480.965.1225

<http://ovprea.asu.edu/>

The Biodesign Institute

480.727.0370

<http://www.biodesign.asu.edu>



REPORT FOR THE FISCAL YEAR ENDING  
JUNE 30, 2007

TECHNOLOGY AND RESEARCH  
INITIATIVE FUND (TRIF)



*The application of informatics and computing to bioscience will enable physicians and other health care practitioners to replace 'off-the-shelf' medical treatments with courses of treatment customized for the individual patient.*

The Department of Biomedical Informatics (BMI) was established in 2005 as a new initiative within the School of Computing and Informatics (SCI) at Arizona State University. The Department is playing an important role in expanding our understanding of disease prevention and treatment and improving patient care through realizing the vision of personalized medicine.

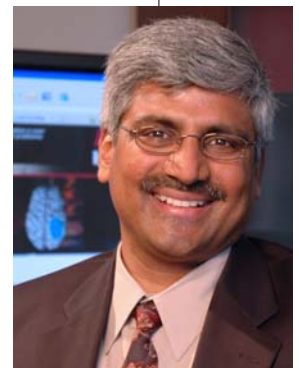
The Department of Biomedical Informatics in collaboration with The University of Arizona supports a partnership between academic researchers, clinical practitioners and regional health care providers to advance research and education in the science and practice of biomedical informatics. The Department's mission is to prepare individuals to make major contributions to the creation and evaluation of computational and informatics tools and their application to biomedical and clinical research, health care practice, public health and education of health professionals and patients.

Biomedical informatics is an emerging scientific discipline that deals with the storage, retrieval, sharing and optimal use of biomedical information, data, and knowledge for problem solving and decision making. The study of biomedical informatics is interdisciplinary, drawing upon many diverse fields including medicine, genetics, biology, engineering, computing and information sciences.

The Department will begin to offer a wide array of academic degrees and programs in biomedical informatics, including a masters degree in Fall 2007, informatics immersion and scholarly projects for medical students at the University of Arizona College of Medicine (UACOM) in Fall 2007, doctoral degree in Fall 2008, undergraduate concentrations in Fall 2009, and continuing education courses for health care professionals.

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Dr. Sethuraman Panchanathan  
Professor and Director,  
School of Computing and Informatics



## PERFORMANCE ANALYSIS

PERFORMANCE MEASURES/IMPACT	FY07 Proj	FY07 Actual	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<b>Return on Investment</b> (\$ amounts in millions)						
Federal and non-federal awards	0.80	1.76	2.00	2.83	4.71	6.10
Royalty income	0.02	0.00	0.02	0.03	0.03	0.04
Foundation funding	0.03	0.00	0.04	0.04	0.05	0.06
<b>Return Total</b>	<b>0.85</b>	<b>1.76</b>	<b>2.06</b>	<b>2.90</b>	<b>4.80</b>	<b>6.20</b>
<b>Economic Impact</b>						
BMI tenure-track faculty hired by the Department [FTE]	2	2	7	11	14	16
BMI research faculty hired by the Department [FTE]	3	3	4	6	7	8
New invention disclosures and patent applications filed	N/A	N/A	3	5	8	10
Total start-up companies licensing ASU technology	N/A	N/A	N/A	1	2	3
<b>Students Trained</b>						
Graduate students earning concentrations in BMI	10	Begin Fall 07	10	10	20	20
Graduate students earning masters degrees in BMI	N/A	N/A	10	20	30	40
Graduate students earning doctoral degrees in BMI	N/A	N/A	N/A	5	10	15
Undergraduate students earning concentrations in BMI	N/A	N/A	N/A	N/A	20	30
Medical students trained in informatics	N/A	N/A	24	48	72	96
<b>Partnerships/Collaborations</b>						
Number of parternships with biomedical providers	4	6	8	12	14	16
Number of parternships with industry	2	1	4	8	12	15

The FY07-FY11 **Return on Investment** measures include federal and non-federal awards, royalty income and foundation funding. The sum of these three components (the **Return Total**) is divided by TRIF expenditures for the fiscal year to arrive at the **Return on Investment** ratio included in the financial table on page 3.

## DISCUSSION OF PERFORMANCE

**Return on Investment** The Department of Biomedical Informatics is well-poised to begin generating substantial research dollars from federal and non-federal awards. BMI investigators and affiliated SCI faculty currently hold 9 grants totaling nearly \$3 million and have submitted 16 proposals totaling over \$9 million. BMI proposal activity will continue to increase as newly recruited senior faculty transfer current projects to ASU, additional research centers are developed (see page 3) and new junior faculty arrive and become research productive. The new biomedical informatics research facility on the downtown Phoenix Biomedical Campus opened in early July 2007.

**Economic Impact** The department will generate research and clinical partnerships that have a significant impact on the local economy. The department is hiring a cadre of world-class biomedical informatics researchers and practitioners that will soon be research productive. Existing university-industry collaborations in biomedical, clinical and bioinformatics will augment the strong public health collaborations already in place. The BMI program is positioned to be a top five program and will draw significant external funding. Its collaborations will generate intellectual property and are well positioned to be competitive in an aggressively growing, venture friendly market niche.

**Students Trained** The department will offer a Master's of Science in Biomedical Informatics degree program in Fall 2007. The department has admitted 12 outstanding students with backgrounds including: medicine, clinical psychology, biology, biophysics, engineering and computer science. In addition, our faculty will provide immersive informatics instruction, beginning with the first cohort of 24 medical students enrolled at UACOM. Development of the doctoral program in biomedical informatics is progressing with ABOR approval for this program expected in December 2007. BMI will defer the proposed concentration for Computer Science & Engineering graduate students until the BMI degree programs are established.

**Partnerships/Collaborations** Partnerships and collaborative relationships will play a critical role in the success of BMI. Collaborative partnerships are in place with the University of Arizona College of Medicine, Banner Health, Barrow Neurological Institute, The Critical Path Institute, Mayo Clinic—Scottsdale, and the Translational Genomics Research Institute. These partnerships include joint hires, joint research projects, and planned BMI student internships and projects. Moving forward, the department will expand its partnerships and research collaborations with industry and relevant state agencies. Current discussions are underway with Siemens, Cisco, and the Arizona Health Care Cost Containment System.

## BMI RESEARCH FOCI

BMI is building core research strengths in Bioinformatics, Imaging Informatics, Clinical Informatics, and Public Health Informatics. In addition, the department will have a unique strength in Cognition and Decision Making, a unique field spanning all of these domains as well as the cognitive sciences.

**Bioinformatics** focuses on the development and application of computational tools to analyze biomedical data and study biological systems. ASU BMI investigators work on projects such as modeling of gene regulatory networks to decipher cancer pathways. Plans are underway to develop a Center for Bioinformatics that will work closely with the Translational Genomic Research Institute (TGen) and our genomic partners.

**Imaging Informatics** focuses on the development of information technology and computational tools to manage and analyze medical images to support decision-making and patient care. Imaging Informatics is a research strength of the ASU School of Computing and Informatics and one that BMI will continue to leverage. Our investigators work on projects such as identifying brain aneurysms using computer tomography angiography.

**Clinical Informatics** focuses on maximizing the use of biomedical information in patient care, clinical research and biomedical education. BMI investigators implement and evaluate computerized order entry systems in hospital clinics. Plans are underway to develop a Center for Clinical Informatics that will work closely with our clinical partners to make health care safer and more effective for Arizonans.

**Public Health Informatics** focuses on applying information science and technology to public health practice and research. The Center for Health Information and Research (CHIR) is led by Dr. William G. Johnson. CHIR has developed a comprehensive relational database containing health information for the entire population of Arizona. CHIR was recently selected as one of six national demonstration sites to test and evaluate health care outcome measures for Medicare beneficiaries.

**Cognition & Decision Making** research focuses on the analysis of medical errors, developing and using clinical guidelines, models for problem solving and decision-making and the evaluation of human-computer interactions. The BMI Center for Cognition and Decision Making is led by Dr. Vimla L. Patel. Current projects include the development of a cognitive framework for understanding and reducing medical errors in critical care environments.

## FINANCIALS

	FY07 Rev Budget	FY07 Actual	FY08 Rev Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>						
Carry Forward	1,000,000	1,000,000	\$ 1,448,800			
New TRIF Revenue	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
<b>TOTAL REVENUE</b>	<b>\$2,000,000</b>	<b>\$2,000,000</b>	<b>\$2,448,800</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>
<b>OPERATING BUDGET</b>						
Personal Services	1,022,000	200	721,100	720,700	720,700	720,700
Employee Related Expenses	216,800	0	79,400	79,300	79,300	79,300
Operating Expenses	761,200	551,000	1,648,300	200,000	200,000	200,000
<b>Total Operating Budget</b>	<b>\$2,000,000</b>	<b>\$551,200</b>	<b>\$2,448,800</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>
<b>CAPITAL BUDGET</b>						
Building Renovation						
Debt Service						
<b>Total Capital Budget</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL EXPENDITURES</b>	<b>\$2,000,000</b>	<b>\$551,200</b>	<b>\$2,448,800</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>
<b>Return On Investment</b>	<b>0.4:1</b>	<b>3.2:1</b>	<b>0.8:1</b>	<b>2.9:1</b>	<b>4.8:1</b>	<b>6.2:1</b>

Note: FY 2007 Carry Forward amounts include FY 2006 TRIF revenue in excess of budget ("Over-Realized Revenue") received by ABOR in FY 2006 but not allocated to the universities until October 2006 (FY 2007). Because of necessary planning time required by the universities, not all funds were expended in FY 2006.

## GOALS & RESULTS

**Goals:** The goals of the Department of Biomedical Informatics include:

- Focusing on use-inspired research that will result in demonstrable improvements in patient care and biomedical research.
- Becoming a nationally recognized leader in biomedical informatics research.
- Embracing new types of collaborations with local and regional partners.
- Leveraging research expertise in Arizona.
- Providing an educational experience that is truly interdisciplinary by bridging traditional boundaries in scientific and medical education.
- Training a new generation of physicians and other health care professionals facile in biomedical computing.
- Serving as a resource to Arizona's biomedical/bioscience community and public health agencies.
- Contributing to the economic development and well-being of the community by supporting and advancing bioscience and biomedical research in Arizona.



Dr. Vimla L. Patel  
Professor and Interim Chair,  
Department of Biomedical Informatics

### Results and Updates:

- Vimla L. Patel was hired as Professor and Interim Chair. Dr. Patel joins ASU from the top-ranked BMI Department at Columbia University.
- Faculty in the department have secured nearly \$3 million in funding. These include a \$894,000 contract from the DHHS Centers for Medicare & Medicaid and a \$710,000 grant from the National Science Foundation.
- Two junior faculty have been hired: Trevor Cohen, MD, PhD from the Columbia University's Department of Biomedical Informatics, and Valintin Dinu, PhD, from Yale University's program in Computational Biology and Bioinformatics. In addition, Edward Shortliffe, Dean of UACOM, was cross-appointed as a BMI Professor.
- The department is negotiating with a Chair candidate and two senior faculty to lead a Center for Bioinformatics and a Center for Clinical Informatics.
- Dr. Patel has moved her laboratory of Decision Making and Cognition to ASU. Negotiations with Banner Health, Mayo and Cisco are underway for joint projects.
- The Master's degree program in Biomedical Informatics received 17 applications and admitted 12 students to date. Five new BMI courses will be offered in Fall 2007.
- BMI Completed the move to the Arizona Biomedical Collaborative Building 1 on the downtown Phoenix Biomedical Campus.

## MANAGEMENT

### IRA. A. FULTON SCHOOL OF ENGINEERING

Deirdre Meldrum, Dean

### SCHOOL OF COMPUTING & INFORMATICS

Sethuraman Panchanathan, Director

Vimla Patel, Professor and Interim Chair, BMI

## ADVISORY BOARD

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☆ = BMI Department Chair

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**Michael Bittner, PhD** — Director and Sr. Investigator, Translational Genomics Research Institute

☆★ **Christopher G. Chute, MD, DrPh** — Professor and Chair of Biomedical Informatics, Mayo Clinic Medical School

☆★ **Joyce A. Mitchell, PhD** — Professor and Chair, Department of Medical Informatics, University of Utah

☆★ **Mark A. Musen, MD, PhD** — Head, Stanford Medical Informatics and Professor of Medicine, Stanford University

**George Poste, DVM, PhD, DSc** — Director, The Biodesign Institute at Arizona State University and Dell E. Webb Distinguished Professor of Biology

**Kristen B. Rosati, JD** — Partner, Coppersmith Gordon Schermer Owens & Nelson, PLC

☆★ **Edward H. Shortliffe, MD, PhD** — Rolf H. Scholdager Professor and Chair, Department of Biomedical Informatics, Columbia University

**Gustavo Stolovitzky, PhD** — Manager, IBM Functional Genomics and Systems Biology Group, IBM Research, TJ Watson Research Center

## BUILDING LOCATIONS

*The BMI Department is located in the Arizona Biomedical*



*Collaborative Building 1 in downtown Phoenix and in the Brickyard Building on the Tempe campus of ASU.*

## LEARN MORE

### Department of Biomedical Informatics

Telephone: 480.727.7747

Web: <http://bmi.asu.edu>

Email: [bmi@asu.edu](mailto:bmi@asu.edu)



**ARIZONA STATE UNIVERSITY POLYTECHNIC**  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 ACTUAL / FY 2008-2011 BUDGET  
**Campus Capital Infrastructure Development**

	FY 2007 REV BUDGET	FY 2007 ACTUAL	FY 2008 REV BUDGET	FY 2009 BUDGET	FY 2010 BUDGET	FY 2011 BUDGET
<b>REVENUE</b>						
Carryforward	\$ (5,000)	\$ (5,000)	\$ 76,900	\$ -	\$ -	\$ -
TRIF Revenue	2,128,000	2,128,000	2,005,900	2,084,200	2,083,800	2,081,600
<b>TOTAL REVENUE</b>	<b>\$ 2,123,000</b>	<b>\$ 2,123,000</b>	<b>\$ 2,082,800</b>	<b>\$ 2,084,200</b>	<b>\$ 2,083,800</b>	<b>\$ 2,081,600</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services						
ERE						
All Other Operating						
<b>TOTAL OPERATING BUDGET</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>CAPITAL BUDGET</b>						
Building Renovation						
Debt Service						
COPs Lease Purchase Payment	2,123,000	2,046,100	2,082,800	2,084,200	2,083,800	2,081,600
<b>TOTAL CAPITAL BUDGET</b>	<b>2,123,000</b>	<b>2,046,100</b>	<b>2,082,800</b>	<b>2,084,200</b>	<b>2,083,800</b>	<b>2,081,600</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 2,123,000</b>	<b>\$ 2,046,100</b>	<b>\$ 2,082,800</b>	<b>\$ 2,084,200</b>	<b>\$ 2,083,800</b>	<b>\$ 2,081,600</b>

**INITIATIVE OVERVIEW**

The ASU Polytechnic Proposition 301 initiative funds \$27.5 million of Certificates of Participation (COPs) for infrastructure development, including multiple building renovations, campus infrastructure improvements and a new campus student union. The building renovations prepared academic space, including classrooms, faculty and staff offices, and student support services to meet anticipated growth. The infrastructure improvements continued the transition of the former Williams Air Force Base to an attractive university campus. The major projects included campus street and roadway improvements, new campus malls, lighting and emergency telephones, and campus landscape improvements.

The COPs were issued in June, 2002. Scheduled payments run through 2021. Approximately \$26.8 million (98%) of the COPs was committed to building renovation and campus infrastructure projects at ASUP. Completed projects include the Administration Building, the Simulator Building renovations, the renovation of Wanner and Sutton Halls, as well as the North and South Pedestrian Malls. Both the new Union Building and the Agribusiness Center renovation projects were completed in August 2004 and were fully operational for the fall semester. ASUP completed all TRIF funded capital improvement projects by June 2005.

**ARIZONA STATE UNIVERSITY WEST**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
**FY 2007 ACTUAL / FY 2008-2011 BUDGET**  
**Classroom Laboratory / Computer Classroom II Building and Central Plant Expansion**

	FY 2007 REV BUDGET	FY 2007 ACTUAL	FY 2008 REV BUDGET	FY 2009 BUDGET	FY 2010 BUDGET	FY 2011 BUDGET
<b>REVENUE</b>						
Carryforward	\$ (3,600)	\$ (3,600)	\$ 63,900			
TRIF Revenue	1,671,600	1,671,600	1,605,100	1,664,600	1,664,000	1,667,000
<b>TOTAL REVENUE</b>	<b>\$ 1,668,000</b>	<b>\$ 1,668,000</b>	<b>\$ 1,669,000</b>	<b>\$ 1,664,600</b>	<b>\$ 1,664,000</b>	<b>\$ 1,667,000</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services						
ERE						
All Other Operating						
<b>TOTAL OPERATING BUDGET</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>CAPITAL BUDGET</b>						
Building Renovation						
Debt Service						
COP's Lease Purchase Payment	1,668,000	1,604,100	1,669,000	1,664,600	1,664,000	1,667,000
<b>TOTAL CAPITAL BUDGET</b>	<b>1,668,000</b>	<b>1,604,100</b>	<b>1,669,000</b>	<b>1,664,600</b>	<b>1,664,000</b>	<b>1,667,000</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 1,668,000</b>	<b>\$ 1,604,100</b>	<b>\$ 1,669,000</b>	<b>\$ 1,664,600</b>	<b>\$ 1,664,000</b>	<b>\$ 1,667,000</b>

**INITIATIVE OVERVIEW**

The ASU West Proposition 301 initiative funds \$21.6 million of Certificates of Participation (COPs) for two campus improvement projects, a 104,400 gross square foot (GSF) Laboratory/Computer Classroom Building (CLCC II) and a Central Plant expansion. The CLCC II building includes approximately 42,000 net assignable square footage (NASF) of instructional space with a 150 seat lecture hall, two 80 seat classrooms, ten 60 seat classrooms, two 40 seat computer classrooms, five science labs and one computer lab. The Central Plant expansion added 4,800 GSF for a new 1,000 ton chiller, a thermal storage tank, and utility line extensions required to service the CLCC II building.

The COPs were issued in June, 2002. Scheduled payments run through 2021. Construction on the projects was complete for the Spring 2004 semester.

**ARIZONA STATE UNIVERSITY**  
**FY 2007-2011 ASU-UA Joint Biomedical Research Fund**

**September 1, 2007**

Arizona State University and The University of Arizona jointly administer the TRIF-funded *Collaborative on Biomedical Research Grant Program*, with awards totaling \$2,000,000 (\$1,000,000 each) in FY 2007 and \$1,000,000 (\$500,000 each) per year in FY 2008-FY 2011.

These projects are collaborative in nature and may also include other biomedically oriented organizations such as the Translational Genomics Research Institute (T-Gen), the Critical Path Institute (C-Path), the many health-related institutions in the state, and Northern Arizona University. This investment will accelerate development of the research enterprise associated with the Phoenix Track of the UA College of Medicine and the state-wide development of biomedical research. The funds are targeted to support joint research ventures among the institutions, and translating from basic to clinical research.

The main objectives of the program are to provide seed funding to:

1. Support the development and strengthening of collaborative research ties between ASU and UA as a basis for enhancement of state-wide interaction among research institutions; and
2. Support the development and submission of proposals for external funding of research from competitive granting agencies (e.g., NSF, NIH, DOE, etc.) and industry.

To administer these funds, ASU and UA have established a coordinating committee to set the scientific and technical criteria for selection and to make the awards. The coordinating committee includes the Presidents and Vice Presidents for Research from ASU and UA. Review of proposals includes input from faculty at these universities and, when deemed useful, also will be from prominent biomedical scientists from outside the university system. While some projects in the first year were selected specifically to enhance collaborative ties between ASU's Biodesign Institute and UA's BIO5 Institute, as a general practice, projects are solicited through a broad Request for Proposals, and are selected according to the following criteria:

- Scientific excellence
- Collaboration of faculty members from more than one institution as principal investigators
- Likelihood of success in securing long-term, significant federal or other (e.g., Science Foundation Arizona) funding
- Clear demonstration of the value-added significance of the inter-institutional collaboration required
- Potential for significant impact on our understanding of basic biomedical mechanisms or translation of research results to the clinical setting
- Potential for impact on overall State-wide strength in the biomedical sciences.

Thus far the program has awarded \$1,999,977 in FY 2007 and \$1,000,000 in FY 2008 for the following projects:

<b>Title</b>	<b>FY 2007</b>	<b>FY 2008</b>
Proteomic and Metabolomic Biomarker Investigation of Type 2 Diabetes	\$250,000	
Geno- and Immuno-Signatures in Acute Asthma	\$297,977	
Development of a Rapid Immunosignature Diagnostic Test for Valley Fever	\$320,000	
Molecular Therapeutics Collaborative Program between BIO5 and Biodesign Institutes	\$325,000	
Rapid Biomarker Analysis for Emergency Medicine	\$157,141	\$196,682
A Network-Science Approach to Normal- Tissue Organization and Carcinogenesis	\$141,562	\$180,468
A Digital Media Based Biofeedback System for Neural Rehabilitation	\$147,309	\$184,057
Evaluating the Role of VDR Polymorphisms and B-Catenin Signaling in Colorectal Adenoma Risk	\$65,414	\$81,642
Selective Modulation of Basal Ganglia Excitability: A Potential Gene Therapy for Parkinson's Disease	\$151,685	\$178,441
Novel Superluminescent LEDs and Ultrahigh-resolution for OCT for Medical Imaging Applications	\$143,889	\$178,710
<b>TOTAL AWARDS</b>	<b>\$1,999,977</b>	<b>\$1,000,000</b>

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## **PLANNING FOR PHOENIX BIOMEDICAL CAMPUS (PBC)**

Status Report on Steering Committee Activities Related to the Medical Education Building (MEB), Arizona Biomedical Collaborative II (ABC II), and the Phoenix Biomedical Campus Comprehensive Development Plan

September 1, 2007

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### **1. Committee Activities:**

The Phoenix Biomedical Campus (PBC) Steering Committee is composed of representatives from The University of Arizona, Arizona State University, Northern Arizona University, the Arizona Board of Regents, the City of Phoenix, and other stakeholders. Since October of 2006, the Committee has met on a regular basis. The following is a chronological list of events and activities related to the Steering Committee's efforts:

- In March 2007, welcomed Dr. Edward H. (Ted) Shortliffe as Dean of The University of Arizona College of Medicine-Phoenix, in Partnership with Arizona State University on the Phoenix Biomedical Campus. Dean Shortliffe has been actively involved in the planning process; for example, joining biomedical campus field investigations at the University of Pennsylvania Medical Center in Philadelphia.
- Retained the services of the SmithGroup (facilities programming), Rider Levett Bucknall (cost estimating), and Ayers Saint Gross (ASG) (campus master planning). These procurements were expedited through The University of Arizona's open-end contracting process. As such, the UA is serving as the contracting agent for purposes of billings, invoices, etc.
- Using the combined services of the SmithGroup and Ryder Hunt, completed the final programming and initial cost estimating for the Medical Education Building (MEB) and Arizona Biomedical Collaborative II (ABC II) in May 2007. Approximately 710,000 square feet of needed facilities were identified, with a preliminary total cost in excess of \$470 million.
- Also in May 2007, completed a Conceptual Ten Year Facilities Plan for the Biomedical Campus. The Plan examines the demand for facilities to accommodate projected enrollment and staffing, and concludes that additional research space will be needed in the ten-year planning horizon.

- In July 2007, issued a Request for Qualifications for professional design services on both MEB and ABC II. Statements of Qualifications were received on July 30, 2007, and will be evaluated by a selection team representing the Steering Committee. It is projected that teams will be selected by late August 2007 and that contracts can be negotiated by early October 2007.
- Commenced the Campus Comprehensive Development Plan for the 28-acre Phoenix Biomedical Campus. Initial activities included benchmarking other academic health science center campuses and reviewing long-term program facility requirements. Subsequently, Steering Committee representatives and key officials have visited and are continuing to visit selected campuses and medical centers throughout the United States (e.g., Johns Hopkins). The Committee has also met with various utility groups and other key stakeholders, and is now preparing alternative campus development strategies with the support of their planning consultants.

## **2. Proposed Schedule:**

- August 2007: Complete site visits in August 2007, and finalize alternative campus development concepts. Initiate public review process.
- September 2007-mid-October 2007: Select preferred campus plan, finalize design guidelines and other scope elements (utilities, parking, circulation, etc.). Forward to Arizona Board of Regents and the City of Phoenix Mayor and Council for consideration and possible adoption.

## **3. Issues to be Resolved:**

- Role of private sector in developing the PBC campus.
- Funding or financing of parking structure and other components of the PBC campus infrastructure (e.g., open space, utilities, etc.).

## **4. Use of \$1.5 Million in ABOR Planning Funds:**

ASU and UA were each allocated \$750,000 in TRIF planning funds by the Arizona Board of Regents for this purpose. To date, \$344,300 has been spent with an additional \$220,000 encumbered for programming, cost estimating, and planning of MEB, ABC II, and related support facilities for the long-term development of the 28-acre PBC. The balance of these funds will be utilized in the design of the MEB and ABC II projects, augmenting the \$10.5 million already allocated for design phase activities.

**NORTHERN ARIZONA UNIVERSITY  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 ACTUAL / FY 2008 - 2011 BUDGETS  
SUMMARY**

	FY 2007 REVISED BUDGET	FY 2007 ACTUAL	FY 2008 REVISED BUDGET	FY 2009 BUDGET	FY 2010 BUDGET	FY 2011 BUDGET
<b>REVENUE</b>						
Carryforward	\$ 10,148,577	\$ 10,148,577	\$ 6,058,991	\$ -	\$ -	\$ -
TRIF Revenue	12,377,875	12,377,875	13,036,715	13,840,555	14,502,042	15,289,419
<b>TOTAL REVENUE</b>	<b>\$ 22,526,452</b>	<b>\$ 22,526,452</b>	<b>\$ 19,095,706</b>	<b>\$ 13,840,555</b>	<b>\$ 14,502,042</b>	<b>\$ 15,289,419</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services	\$ 6,352,246	\$ 5,696,027	\$ 7,050,727	\$ 5,890,734	\$ 5,908,232	\$ 5,937,876
ERE	1,893,625	1,583,404	1,892,474	1,421,820	1,428,401	1,440,725
All Other Operating	4,331,351	2,198,500	7,228,605	4,222,380	4,732,979	5,344,604
<b>TOTAL OPERATING BUDGET</b>	<b>12,577,222</b>	<b>9,477,931</b>	<b>16,171,806</b>	<b>11,534,934</b>	<b>12,069,612</b>	<b>12,723,205</b>
<b>CAPITAL BUDGET</b>						
Building Renovation	-	-	-	-	-	-
Debt Service	6,081,262	4,989,530	2,185,423	2,305,621	2,432,430	2,566,214
Conference Center	2,000,000	2,000,000	-	-	-	-
<b>TOTAL CAPITAL BUDGET</b>	<b>8,081,262</b>	<b>6,989,530</b>	<b>2,185,423</b>	<b>2,305,621</b>	<b>2,432,430</b>	<b>2,566,214</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 20,658,484</b>	<b>\$ 16,467,461</b>	<b>\$ 18,357,229</b>	<b>\$ 13,840,555</b>	<b>\$ 14,502,042</b>	<b>\$ 15,289,419</b>
<b>AZUN</b>	<b>\$ 4,058,332</b>	<b>\$ 2,320,413</b>	<b>\$ 3,128,634</b>	<b>\$ 4,454,901</b>	<b>\$ 2,516,053</b>	<b>\$ 2,654,436</b>
<b>SUMMARY BY INITIATIVE</b>						
Access and Workforce Development	\$ 5,556,985	\$ 5,556,985	\$ 5,185,423	\$ 5,305,621	\$ 5,432,430	\$ 5,566,214
Growing Biotechnology	921,948	921,948	871,539	913,880	913,880	913,880
e-Learning	2,041,506	2,041,506	2,034,698	1,810,000	1,810,000	1,810,000
ERDENE (Environmental)	1,967,864	1,967,864	2,532,896	1,872,092	1,872,092	1,872,092
Capital Projects	2,662,178	2,662,178	-	-	-	-
University Initiatives	3,187,593	2,893,803	1,725,848	1,626,521	2,133,760	2,668,895
Allied Health Expansion	2,160,205	32,165	3,182,836	1,156,220	1,169,940	1,229,169
Statewide Expansion	2,160,205	391,012	2,823,989	1,156,221	1,169,940	1,229,169
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 20,658,484</b>	<b>\$ 16,467,461</b>	<b>\$ 18,357,229</b>	<b>\$ 13,840,555</b>	<b>\$ 14,502,042</b>	<b>\$ 15,289,419</b>

\*Note: FY 2007 revenue/expense reported prior to official fiscal year close. \*\*Note: AZUN 2009-2011 assumes renewal of MOU between ABOR and NAU. Current MOU is set to expire 6/30/08.

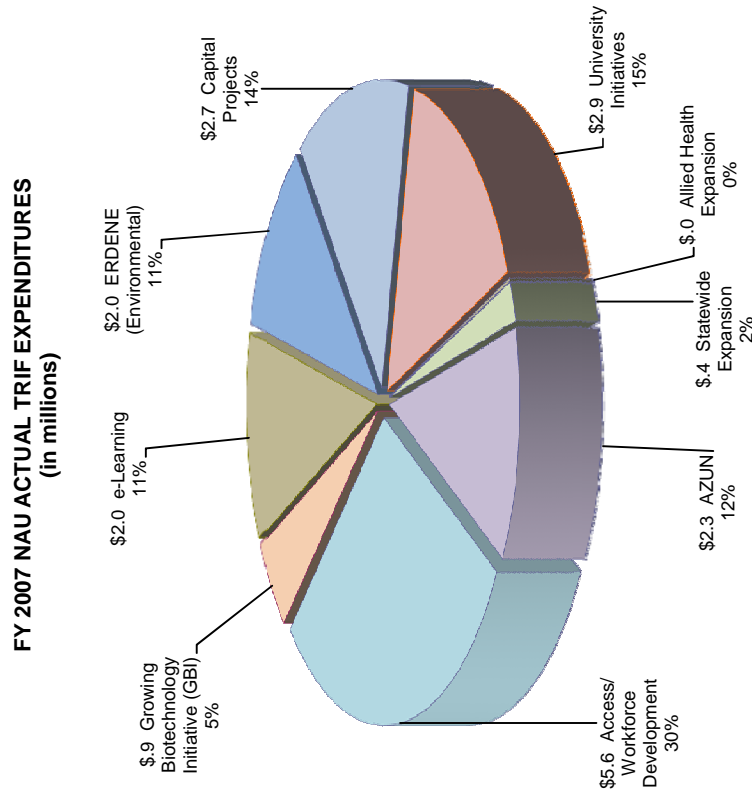
**NORTHERN ARIZONA UNIVERSITY  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 ACTUAL / FY 2008 - 2011 BUDGETS  
ARIZONA UNIVERSITIES NETWORK (AZUN) SUMMARY**

	<b>FY 2007 REVISED BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 REVISED BUDGET</b>	<b>FY 2009 BUDGET</b>	<b>FY 2010 BUDGET</b>	<b>FY 2011 BUDGET</b>
<b>REVENUE</b>						
Carryforward	\$ 3,115,813	\$ 3,115,813	\$ 2,938,105	\$ 2,070,021	\$ -	\$ -
TRIF Revenue	2,142,705	2,142,705	2,260,550	2,384,880	-	-
<b>TOTAL REVENUE</b>	<b>\$ 5,258,518</b>	<b>\$ 5,258,518</b>	<b>\$ 5,198,655</b>	<b>\$ 4,454,901</b>	<b>\$ -</b>	<b>\$ -</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services	\$ 1,086,139	\$ 721,011	\$ 973,664	\$ 1,069,176	\$ -	\$ -
ERE	316,393	236,840	281,407	311,843	-	-
All Other Operating	2,655,800	1,362,562	1,873,563	3,073,882	-	-
<b>TOTAL OPERATING BUDGET</b>	<b>4,058,332</b>	<b>2,320,413</b>	<b>3,128,634</b>	<b>4,454,901</b>	<b>-</b>	<b>-</b>
<b>CAPITAL BUDGET</b>						
Building Renovation	-	-	-	-	-	-
Debt Service	-	-	-	-	-	-
Conference Center	-	-	-	-	-	-
<b>TOTAL CAPITAL BUDGET</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 4,058,332</b>	<b>\$ 2,320,413</b>	<b>\$ 3,128,634</b>	<b>\$ 4,454,901</b>	<b>\$ 2,516,053</b>	<b>\$ 2,654,436</b>

\*Note: FY 2007 revenue/expense reported prior to official fiscal year close.

**NORTHERN ARIZONA UNIVERSITY**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
**FY 2007 BUDGET / ACTUAL**  
**SUMMARY BY PROGRAM AREA**

	FY 2007 REVISED BUDGET	FY 2007 ACTUAL
<b>REVENUE</b>		
Carryforward	\$ 10,148,577	\$ 10,148,577
TRIF Revenue	12,377,875	12,377,875
<b>TOTAL REVENUE</b>	<b>\$ 22,526,452</b>	<b>\$ 22,526,452</b>
<b>EXPENDITURES</b>		
<b>OPERATING BUDGET</b>		
Personal Services	\$ 6,352,246	\$ 5,696,027
ERE	1,893,625	1,583,404
All Other Operating	4,331,351	2,198,500
<b>TOTAL OPERATING BUDGET</b>	<b>12,577,222</b>	<b>9,477,931</b>
<b>CAPITAL BUDGET</b>		
Building Renovation	-	-
Debt Service	6,081,262	4,989,530
Conference Center	2,000,000	2,000,000
<b>TOTAL CAPITAL BUDGET</b>	<b>8,081,262</b>	<b>6,989,530</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 20,658,484</b>	<b>\$ 16,467,461</b>
<b>AZUN</b>	<b>\$ 4,058,332</b>	<b>\$ 2,320,413</b>
<b>SUMMARY BY INITIATIVE</b>		
Access/Workforce Development	\$ 5,556,985	\$ 5,556,985
Growing Biotechnology Initiative (GBI)	921,948	921,948
e-Learning	2,041,506	2,041,506
ERDENE (Environmental)	1,967,864	1,967,864
Capital Projects	2,662,178	2,662,178
University Initiatives	3,187,593	2,893,803
Allied Health Expansion	2,160,205	32,165
Statewide Expansion	2,160,205	391,012
AZUN	4,058,332	2,320,413
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 24,716,816</b>	<b>\$ 18,787,874</b>



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# TRIF PROGRAM



NORTHERN  
ARIZONA  
UNIVERSITY

September 1, 2007

## THE NORTHERN ARIZONA UNIVERSITY TRIF PROGRAM

In the first five years of TRIF funding, from FY 2002 to FY 2006, Northern Arizona University made significant strides in two areas: Workforce Development and Applied Research.

Two of our eight projects, [Growing Biotechnology Infrastructure \(GBI\)](#) and [Education and Research for the New Economy \(ERDENE\)](#), together represent progress in environmental issues, policies, and biotechnology all of which are areas of concern to Arizona's policymakers and citizens.

Another three projects, [Access & Workforce Development \(AWD\)](#), [e-Learning](#), and the [Arizona Universities Network \(AZUN\)](#) together have resulted in substantial expansion in educational opportunities to the state's time and place bound students, involvement of Flagstaff based faculty in web course development, and improvement in technology enhanced instruction. [AZUN](#), from its statewide perspective, particularly combines areas of strength within each of the state universities to make available unique programs that represent multi-university efforts and capabilities.

The remaining three projects, [University Initiatives](#), [Healthcare Program Expansion](#), and [Statewide Expansion](#) have allowed Northern Arizona University to invest in TRIF related opportunities that would not have otherwise been possible. ABOR approved NAU's request to form a new College of Health & Human Services, to expand Healthcare Programs on the Flagstaff campus, and in NAU's Tucson, Yuma, and Phoenix facilities. In addition, a new Health Professions Building is in progress for occupation by FY 2010. Meeting our present and future higher education goals would not have been possible without the combined support of TRIF and new State funding.

The university will continue to successfully and responsibly manage TRIF funding, implement our TRIF initiatives according to the approved Business Plans, and use approved TRIF over-attainment funds to develop our new Phoenix-North Valley facility.

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*Dr. John Haeger, President  
Northern Arizona University*

# PERFORMANCE ANALYSIS

GBI / ERDENE	FY 02		FY 03		FY 04		FY 05		FY 06		FY 07		FY 08		FY 09		FY 10		FY 11		
	Proj	Act	Proj	Act	Proj	Act	Proj	Act	Proj	Act	Proj	Act	Proj	Act	Proj	Act	Proj	Act	Proj	Act	
<b>ROI</b>	\$6.20	\$7.90	\$6.10	\$11.30	\$6.60	\$11.00	\$8.10	\$15.20	\$8.30	\$8.90	\$7.20	\$14.90	\$8.10	\$8.10	\$8.90	\$10.10	\$10.90				
		4.20:1		4.56:1		3.72:1		5.71:1		3.28:1		5.1:1		2.91:1		3.63:1		3.91:1			
<b>Publications/Conferences</b>																					
	0	14	15	19	15	21	17	28	8	26	3	21	5	5	10	15	20				
	17	133	135	180	138	197	150	373	47	166	160	286	180	190	210	220					
<b>Tech Transfer</b>																					
	2	2	2	2	2	2	2	1	3	3	2	2	3	4	5	6					
	0	0	1	5	1	49	1	8	3	13	2	5	5	7	10	12					
<b>Economic Development</b>																					
	2	3	6	3	7	7	9	21	12	10	1	5	3	5	7	11					
<b>Workforce Contributions</b>																					
	92	116	110	149	116	162	120	60	131	67	70	58	82	85	93	100					
	76	106	110	205	112	106	100	93	110	135	120	119	135	160	175	195					
<b>Specific Collaborations</b>																					
	0	85	85	312	85	1361	90	142	46	274	121	42	132	142	152	162					
	17	58	48	105	55	112	59	142	66	154	75	86	84	92	99	108					
	17	23	24	104	24	63	27	98	32	84	38	143	41	47	48	54					
<b>Access and Workforce Development / e-Learning</b>																					
<b>New Students Served</b>																					
	250	460	542	545	807	807	600	679	700	773	700	804	700	750	750	750					
	120	200	266	200	414	300	464	350	350	540	400	721	500	500	600	600					
	44	50	182	60	303	200	442	350	350	528	400	673	400	450	500	500					
	11	12	19	15	37	20	41	40	40	41	40	41	42	44	46	48					
<b>Enhanced Courses Developed</b>																					
	10	125	150	101	130	121	90	141	80	22	100	80	95	90	85	80					
	25	150	175	117	190	155	120	126	120	241	200	325	225	250	300	350					
<b>Student Course Involvement</b>																					
	0	7,110	4,000	9,476	4,500	10,133	11,000	12,381	12,000	14,116	12,500	20,526	12,750	13,000	13,500	14,000					
	0	0	500	1,703	600	136	500	980	500	568	150	480	175	200	300	300					
<b>Partnerships</b>																					
	30	30	51	30	119	60	127	120	120	844	350	1,791	75	50	200	200					
	17	18	19	18	20	19	20	19	19	22	20	22	20	20	20	20					
	2	6	21	6	42	26	77	51	51	80	51	80	54	57	60	62					
<b>Technology Transfer</b>																					
	0	2	5	2	0	2	0	2	2	0	1	0	1	1	1	1					

# PERFORMANCE ANALYSIS

In addition to the Initiative successes described on page 1 and 2 of this brochure, Northern Arizona University has made significant progress with their "University Initiative" project investments. TRIF funds contributed substantially to two new buildings: the Applied Research and Development building and the new NAU Hotel and Conference Center. TRIF funds were approved to build NAU's new Health Professions Building, which is in its early planning stage, and projected to be occupied by FY 2010. With TRIF over-attainment funds, NAU has already started expanding health care programs on its Flagstaff campus and the new Phoenix-North Valley facility. The new North Valley facility allows NAU to expand and consolidate programs in Maricopa County. TRIF funds have also been used to supplement both forest and genomics research on a short-term basis.



Applied Research and Development Building (ARD Bldg)  
Occupied April 2007

# FINANCIAL INFORMATION

Actual  
Budget

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
<b>GILBERT/ERE</b>	Carryforward	\$0	\$538,756	\$734,337	\$273,222	\$830,232	\$1,008,633	\$904,793	\$0	\$0
	New TRIF Revenue	\$2,417,502	\$2,674,544	\$2,498,906	\$2,745,600	\$2,888,423	\$2,785,972	\$2,499,642	\$2,785,972	\$2,785,972
	<b>TOTAL REVENUE</b>	<b>\$2,417,502</b>	<b>\$3,213,300</b>	<b>\$3,233,243</b>	<b>\$3,018,822</b>	<b>\$3,718,655</b>	<b>\$3,794,605</b>	<b>\$3,404,435</b>	<b>\$2,785,972</b>	<b>\$2,785,972</b>
	Personal Services	\$1,278,627	\$1,637,980	\$2,132,447	\$2,335,730	\$1,770,726	\$2,422,274	\$2,987,995	\$2,390,343	\$2,390,343
	Other Operating	\$600,119	\$840,983	\$827,573	\$326,742	\$939,296	\$467,538	\$416,440	\$395,629	\$395,629
<b>TOTAL EXPENSES</b>	<b>\$1,878,746</b>	<b>\$2,478,963</b>	<b>\$2,960,020</b>	<b>\$2,662,472</b>	<b>\$2,710,022</b>	<b>\$2,889,812</b>	<b>\$3,404,435</b>	<b>\$2,785,972</b>	<b>\$2,785,972</b>	<b>\$2,785,972</b>
<b>AWD/LEARNING</b>	Carryforward	\$0	\$2,164,798	\$2,711,282	\$2,468,080	\$2,776,537	\$1,680,175	\$963,175	\$0	\$0
	New TRIF Revenue	\$5,135,099	\$4,878,299	\$5,662,818	\$4,927,273	\$5,183,586	\$6,881,491	\$6,995,423	\$7,115,621	\$7,242,430
	<b>TOTAL REVENUE</b>	<b>\$5,135,099</b>	<b>\$7,043,097</b>	<b>\$8,374,100</b>	<b>\$7,395,353</b>	<b>\$7,960,123</b>	<b>\$8,561,666</b>	<b>\$7,958,598</b>	<b>\$7,115,621</b>	<b>\$7,242,430</b>
	Personal Services	\$2,326,003	\$3,412,531	\$4,069,277	\$4,011,236	\$4,150,864	\$4,703,165	\$4,270,724	\$4,148,892	\$4,148,892
	Other Operating	\$644,328	\$919,284	\$1,836,743	\$1,115,074	\$2,209,443	\$823,835	\$763,974	\$661,108	\$661,108
Debt Service	-	-	-	-	-	\$2,071,491	\$2,185,423	\$2,305,621	\$2,432,430	\$2,566,214
<b>TOTAL EXPENSES</b>	<b>\$2,970,331</b>	<b>\$4,331,815</b>	<b>\$5,906,020</b>	<b>\$5,126,310</b>	<b>\$6,360,307</b>	<b>\$7,598,491</b>	<b>\$7,220,121</b>	<b>\$7,115,621</b>	<b>\$7,242,430</b>	<b>\$7,376,214</b>
<b>UNIVERSITY INITIATIVES AND CAPITAL</b>	Carry Forward	\$0	\$206,744	\$664,608	\$1,522,437	\$3,054,613	\$5,159,771	\$293,790	\$0	\$0
	New TRIF Revenue	\$298,203	\$590,810	\$938,517	\$2,552,961	\$1,764,371	\$690,000	\$1,432,058	\$1,626,521	\$2,133,760
	<b>TOTAL REVENUE</b>	<b>\$298,203</b>	<b>\$797,554</b>	<b>\$1,603,125</b>	<b>\$4,075,398</b>	<b>\$4,818,984</b>	<b>\$5,849,771</b>	<b>\$1,725,848</b>	<b>\$1,626,521</b>	<b>\$2,133,760</b>
	Personal Services	\$36,174	\$72,666	\$62,927	\$385,155	\$340,462	\$153,992	\$484,212	\$345,519	\$364,523
	Operating	\$55,285	\$60,280	\$17,761	\$43,618	-\$681,250	\$483,950	\$1,241,636	\$1,281,002	\$1,769,237
Debt Service	-	-	-	-	\$0	\$2,918,039	-	-	-	
Conference Center	-	-	-	-	\$0	\$2,000,000	-	-	-	
<b>TOTAL EXPENSES</b>	<b>\$91,459</b>	<b>\$132,946</b>	<b>\$80,688</b>	<b>\$428,773</b>	<b>-\$340,788</b>	<b>\$5,555,981</b>	<b>\$1,725,848</b>	<b>\$1,626,521</b>	<b>\$2,133,760</b>	<b>\$2,668,895</b>
<b>HEALTHCARE AND STATEWIDE EXPANSION</b>	Carry Forward	-	-	-	-	\$2,299,998	\$3,897,233	\$0	\$0	\$0
	New TRIF Revenue	-	-	-	\$0	\$1,150,000	\$2,020,412	\$2,312,441	\$2,339,880	\$2,458,338
	<b>TOTAL REVENUE</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,150,000</b>	<b>\$4,320,410</b>	<b>\$6,006,825</b>	<b>\$2,312,441</b>	<b>\$2,339,880</b>
	Personal Services	-	-	-	-	\$0	\$1,200,270	\$427,800	\$432,875	\$454,792
Operating	-	-	-	-	-	\$423,177	\$4,806,555	\$1,884,641	\$1,907,005	\$2,003,546
<b>TOTAL EXPENSES</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$423,177</b>	<b>\$6,006,825</b>	<b>\$2,312,441</b>	<b>\$2,339,880</b>	<b>\$2,458,338</b>
<b>AZUN</b>	Carry Forward	-	-	-	\$1,615,559	\$2,534,652	\$3,115,813	\$2,938,105	\$2,070,021	-
	New TRIF Revenue	-	-	-	\$1,228,962	\$2,034,906	\$2,142,705	\$2,260,550	\$2,384,880	-
	<b>TOTAL REVENUE</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>\$2,844,521</b>	<b>\$4,569,558</b>	<b>\$5,258,518</b>	<b>\$5,198,655</b>	<b>\$4,454,901</b>	<b>\$4,454,901</b>
	Personal Services	-	-	-	\$2,232	\$264,940	\$721,011	\$973,664	\$1,069,176	-
	ERE	-	-	-	\$751	\$79,611	\$236,840	\$281,407	\$311,843	-
	All Other Operating	-	-	-	\$306,886	\$1,109,214	\$1,362,562	\$1,873,563	\$3,073,882	-
<b>TOTAL EXPENSES</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>\$309,869</b>	<b>\$1,453,745</b>	<b>\$2,320,413</b>	<b>\$3,128,634</b>	<b>\$4,454,901</b>	<b>\$4,454,901</b>	<b>\$4,454,901</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## ADVISORY BOARDS

### NAU TRIF OVERSIGHT BOARD

All Northern Arizona University TRIF Initiatives are principally overseen by Dr. John D. Haeger, assisted by Provost Liz Grobsmith and Dr. Lee Drickamer, Vice President for Research (Interim). Appropriate Vice Presidents and Deans also participate in specific project management.

### GROWING BIOTECHNOLOGY (GBI)

#### ENVIRONMENTAL RESEARCH, DEVELOPMENT, AND EDUCATION FOR THE NEW ECONOMY (ERDENE)

GBI Director Dr. Tim Porter and ERDENE Director Dr. Gary Deason report to Dr. Lee Drickamer, Vice President for Research (Interim) and Regents' Professor. Research Initiatives within GBI and ERDENE report to their respective directors.

#### GBI and ERDENE Advisory Board Members:

Laura Huenneke, Dean,  
College Engineering & Natural Sciences

Thomas Whitham, Regents' Professor,  
NAU, Department of Biological Sciences

Barry Gold, Gordon & Betty Moore Foundation

David LaRoche, U.S. Environmental Protection Agency

Edwin Lewis, NAU Professor of Chemistry and Biochemistry

Michael Bittner, Translational Genomics Research Institute

Mary O'Connell, New Mexico State University,  
Plant & Environmental Science

Will Ott and Tom Rainey, Northern Arizona  
Technology and Business Incubator

### NAU TRIF OVERSIGHT BOARD MEMBERS:

Saundra Johnson, Chair, Flinn Foundation  
Paul Begovac, W.L. GORE & Associates, Inc;  
Julie Pastrick, Flagstaff Chamber of Commerce;  
Gary Smith, Unisource;  
Carl Taylor, Coconino County Board of Supervisors;  
Nat White, Lowell Observatory.

### E-LEARNING

#### ACCESS and WORKFORCE DEVELOPMENT (AWD)

AWD is managed by Fred Hurst, Vice President for Extended Programs and Dean of Distance Learning, who reports to President John Haeger.

e-Learning is managed by Director Don Carter, who reports to the Vice Provost for Undergraduate Studies, Dr. Karen Pugliesi. The Vice Provost for Undergraduate Studies reports to Provost Liz Grobsmith.

#### e-Learning and AWD Advisory Board Members:

Tacy Ashby, Ed.D., Superintendent,  
Cave Creek Unified School District;

Jane Bristol, Director of Economic Development, City of Prescott;

Gypsy Denzine, Ph.D., Associate Dean, NAU College of Education;

Pete Hatfield, C.M.E., Honeywell,  
Global Repair Development Engineering;

Mike Kearns, Chancellor-Elect, Mohave Community College

Colleen McGregor, B.S., Designation Specialist & NAU Student,  
Health Systems Development, AZ Department of Health Services;

Mike Paredes, Greater Yuma Economic Council;

Raul Sandoval, Ed.D., Executive Assistant to the President,  
South Mountain Community College

## LEARN MORE

- ⇒ To learn more about **TRIF at NAU**, contact Dr. Lee Drickamer, Vice President for Research (Interim) and Regents' Professor, at [Lee.Drickamer@nau.edu](mailto:Lee.Drickamer@nau.edu) or 928-523-0388.
- ⇒ To find out more about **GBI**, contact Dr. Tim Porter in the Department of Physics, at [Tim.Porter@nau.edu](mailto:Tim.Porter@nau.edu) or 928-523-2540.
- ⇒ To find out more about **ERDENE**, contact Dr. Gary Deason in the Center for Sustainable Environments at [Gary.Deason@nau.edu](mailto:Gary.Deason@nau.edu) or 928-523-4889.
- ⇒ To find out more about **E-Learning**, contact Director Don Carter at [Don.Carter@nau.edu](mailto:Don.Carter@nau.edu), 928-523-1605. or go to [www.nau.edu/elearning](http://www.nau.edu/elearning)
- ⇒ To find out more about **AWD or Statewide Expansion**, contact Fred Hurst, Vice President for Extended Programs and Dean of Distance Learning, at [Fred.Hurst@nau.edu](mailto:Fred.Hurst@nau.edu), or call 928-523-6598, or go to [www.distance.nau.edu](http://www.distance.nau.edu)
- ⇒ To find out more about **Health Care Program expansion**, contact Dr. M.J. McMahon, Executive Vice President, at [mj.mcmahon@nau.edu](mailto:mj.mcmahon@nau.edu), (928) 523-6515, or <http://jan.ucc.nau.edu/~hp-p/>.
- ⇒ To find out more about general TRIF projects and research at NAU, go to [www.research.nau.edu](http://www.research.nau.edu).

NORTHERN  
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# ACCESS & WORKFORCE DEVELOPMENT



NORTHERN ARIZONA UNIVERSITY

September 1, 2007

## ACCESS & WORKFORCE DEVELOPMENT

The Northern Arizona University's Access and Workforce Development (A/WD) initiative addresses the needs of Arizona employers and their current and future employees. A/WD is focused on areas of demonstrated need as defined by the Governor's Taskforce on Education and the Arizona Partnership for a New Economy with support from the Technology and Research Initiative Fund (TRIF).



The Northern Arizona University's E-Learning and Access and Workforce Development Initiatives are closely aligned, sharing staffing and leveraging limited funding to accomplish workforce development goals. Similarly, the NAU efforts are in synergy with the efforts of the Arizona Universities Network (AZUN).

The Access and Workforce Development initiative represents a major commitment by Northern Arizona University to provide education services to Arizona citizens who are time or place bound. This initiative:

1. Addresses the teacher shortage with emphases on alternative certification and preparation of mathematics and science teachers
2. Provides engineers with advanced training to support business and industry
3. Increases the number of advance-trained nurses and other health professionals to maintain quality of life
4. Educates information technology professionals to serve the new economy needs of the state
5. Prepares post-baccalaureate business/non-profit managers to be leaders in existing and new businesses
6. Develops and maintains the support infrastructure for future development of degree and certificates responsive to the needs of the new economy.

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Fred Hurst  
Vice President, Extended Programs  
Dean, Distance Learning

# PERFORMANCE ANALYSIS

METRICS (\$ in millions)	FY 02 Proj	FY 02 Act	FY 03 Proj	FY 03 Act	FY 04 Proj	FY 04 Act	FY 05 Proj	FY 05 Act	FY 06 Proj	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY 09 Proj	FY 10 Proj	FY 11 Proj
<b>Technology Transfer and Industry Collaborations</b>																
Courses/Modules Sold/Brokered		0	2	5	2	0	2	0	2	0	1	0	1	1	1	1
<b>Workforce Contributions</b>																
Potential New Students Served																
New Teachers		250	460	542	545	807	600	679	700	773	700	804	700	750	750	750
Nurses/Health Professionals		120	200	266	200	414	300	464	350	540	400	721	500	500		600
Engineers with Advanced Training		20	N/A	Rprtd in AZUN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business/Non-Profit Managers		44	50	182	60	303	200	442	350	528	400	673	400	450	450	500
<b>Curriculum Innovations</b>																
Number Degree/Certificate Programs		11	12	19	15	37	20	41	40	41	40	41	42	44	46	48
Statewide Access (Rural and Urban) (Yes/No)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional/National Global Access		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number New/Revised Courses		75	80	72	100	105	80	153	180	176	40	206	40	40	40	40
<b>Partnerships/Collaborations</b>																
Number Community College Partners		14	15	16	15	17	16	17	16	19	17	19	17	17	17	17
Tri-University (ASU,NAU,U of A)		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Number K-12 Partners (Schools/Districts)		30	30	51	30	119	60	127	120	127	120	127	125	130	135	140
Number Industry Partnerships		2	5	21	5	42	25	75	50	80	50	80	53	56	59	61

Proposed metrics are based on the expectation of continuous growth in initiative funding over the period FY 2007- FY 2011.

## PERFORMANCE ANALYSIS

### Work Force Contributions: FY 2007 Objectives and Accomplishments

The objectives for FY 2007 included the expansion of existing programs, development or conversion of courses and programs to the web, increasing student capacity in new and existing programs, and incremental growth in enrollment for the following areas: Education, Health Professions, Business and Public Service.

Enrollments for FY 2007 exceeded projections with the on-going expansion of face-to-face programs, establishment of new cohorts, sustained growth in web enrollments, strategic marketing and recruitment efforts, and the expansion to new locations and partnerships all contributing factors in the success of these programs.

- Education saw an overall enrollment growth of 4% from FY 2006, with enrollment in Career and Technical Education seeing the largest growth of 23% with an increase from 137 to 169 students. A new faculty member was added in support of the Elementary Education program in the Phoenix area and cohorts continue to be established in the Phoenix Metro and Tucson areas to meet student needs.
- The Health Professions sustained growth across all programs with the RN to BSN expanding enrollments by 43% from 105 to 150 students. The Master of Nursing and the Accelerated BSN experienced moderate growth of 10% and 12% respectively, and the BAS/BS in Health Sciences substantially increased program enrollments from 191 to 310 students.
- Business and Public Service programs saw strong demand for their programs with both the BAILS/BAS in Public Agency Service and the BAS in Computer Technology program enrollments increasing by more than 30%. The Master in Administration program experienced similar demand with enrollments once again growing by more than 25% over the prior year, expanding from 283 to 361 students. All seven emphases for this program are offered on-line with the Leadership emphasis now available on the ground through the Mesa, North Valley, and North Tucson locations.

## FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Revised Budget	FY 2007 Actual	FY 2008 Revised Budget	FY 2009 Budget	FY 2010 Budget	FY 2011 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$1,490,660	\$2,074,249	\$1,637,061	\$1,579,182	\$1,223,971	\$1,223,971	\$738,477	\$0	\$0	\$0
New TRIF Revenue	\$3,780,744	\$3,716,346	\$3,958,296	\$2,767,273	\$2,911,225	\$5,071,491	\$5,071,491	\$5,185,423	\$5,305,621	\$5,432,430	\$5,566,214
<b>TOTAL REVENUE</b>	<b>\$3,780,774</b>	<b>\$5,207,006</b>	<b>\$6,032,545</b>	<b>\$4,404,334</b>	<b>\$4,490,407</b>	<b>\$6,295,462</b>	<b>\$6,295,462</b>	<b>\$5,923,900</b>	<b>\$5,305,621</b>	<b>\$5,432,430</b>	<b>\$5,566,214</b>
<b>OPERATING BUDGET</b>											
Personal Services	\$1,758,482	\$2,309,262	\$2,758,700	\$2,485,637	\$2,453,797	\$2,973,241	\$2,973,241	\$2,540,800	\$2,540,800	\$2,540,800	\$2,540,800
Operating	\$531,632	\$823,495	\$1,636,784	\$644,637	\$812,639	\$512,253	\$512,253	\$459,200	\$459,200	\$459,200	\$459,200
Debt Services *	-	-	-	-	-	\$2,071,491	\$2,071,491	\$2,185,423	\$2,305,621	\$2,432,430	\$2,566,214
<b>TOTAL EXPENDITURES</b>	<b>\$2,290,114</b>	<b>\$3,132,757</b>	<b>\$4,395,484</b>	<b>\$3,130,274</b>	<b>\$3,266,436</b>	<b>\$5,556,985</b>	<b>\$5,556,985</b>	<b>\$5,185,423</b>	<b>\$5,305,621</b>	<b>\$5,432,430</b>	<b>\$5,566,214</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a six-tenths-cent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

\*Debt Service will be used to cover bond payments associated with the completion of the new Health Professions/Nursing Building

## PERFORMANCE ANALYSIS

### Infrastructure: FY 2007 Objectives and Accomplishments

Objectives were established and met in the following areas to support the A/WD initiatives and to keep pace with the demands of program expansion.

Student Services – Assistance is available to students in-person at over 37 offices around the state, by toll-free phone and online chat. Advising capacity for on-line degrees was increased by two full-time and one part-time advising resource, allowing for a 28% increase in student contact. An increased number of students are using the chat services offered on the Distance Learning website. The average satisfaction of students using the chat tool is 4.5 on a 5 point scale, 5 being excellent.

Technical Infrastructure – High-bandwidth demand is satisfied by 200 Mbps bandwidth; Internet 2 connectivity supports the national exchange of instructional and research data. Modem pools were maintained in rural areas to serve students, with the pools moving to new locations as expansion/relocation activity occurred. The Citrix server has been replaced by the Sun Secure Global Network, and allows remote access of software by approximately 4,015 students. A hardware fire wall solution was implemented to improve web site security, and the ITV video conference network underwent a major upgrade.

Faculty Support – 206 web courses have been developed since FY 2003 with TRIF funding. Over 800 Web classes were taught during Academic Year 2006-2007 using a combination of TRIF and Distance Learning funding with approximately 13% growth in Web enrollments.

Marketing – A comprehensive advertising campaign was launched with the theme, “Everywhere you want to learn.” TRIF programs such as early childhood and elementary education, dental hygiene, business, and administration were heavily promoted through print and web advertising. New brochures, posters, flyers, and bookmarks were developed, produced, and

## MANAGEMENT

Programmatic oversight is in the NAU Distance Learning department with the vice president for extended programs and dean of distance learning directly responsible for activities. Due to the size of this initiative, a single point of contact (SPOC) was assigned to coordinate each program and each college also assigned a SPOC to coordinate with Distance Learning. This new management scheme has resulted in a high level of coordination. Integration with ongoing operations helps ensure sustainability.

## LEARN MORE

Contact Fred Hurst, Vice President for Extended Programs and Dean for Distance Learning, at [Fred.Hurst@nau.edu](mailto:Fred.Hurst@nau.edu), or call 928-523-6598. Or Visit the Distance Learning website at <http://www.distance.nau.edu/>

## ADVISORY BOARD

The A/WD Advisory Board provides guidance on certificate, degree program and student service needs. The key points of discussion during the April 2007 meeting of the board centered around the following topics:

- The process for developing and delivering new programs including needs assessment, modes of delivery and reaching diverse student populations.
- Methods of increasing community engagement.
- Matching business needs with student demand.
- The roles of Board members.

### AWD Advisory Board Members:

#### **Tacy Ashby**

Ed.D., Superintendent,  
Cave Creek Unified School District;

#### **Jane Bristol**

Director of Economic Development, City of Prescott;

#### **Gypsy Denzine**

Ph.D., Associate Dean, College of Education;

#### **Pete Hatfield**

C.M.E., Honeywell  
Global Repair Development Engineering;

#### **Mike Kearns**

Chancellor-Elect, Mohave Community College;

#### **Colleen McGregor**

B.S., Designation Specialist & Current NAU Student  
Health Systems Development,  
Arizona Department of Health Services;

#### **Mike Paredes**

Greater Yuma Economic Council;

#### **Raul Sandoval**

Ed.D., Executive Assistant to the President,  
South Mountain Community College;

#### **Lt. Jeri Williams**

M.Ed., Operations Lieutenant,  
City of Phoenix Police Department,  
Planning & Research Bureau.

**NORTHERN  
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# THE ARIZONA UNIVERSITIES NETWORK

The **Arizona Board of Regents** gateway to quality distance learning



Arizona Universities Network (AZUN), from its statewide perspective, combines areas of strength within each of the state universities, to make available unique programs that represent multi-university efforts and capabilities. The initiative creates educational opportunities that can be delivered to new populations of potential students, including those in rural areas or who are place-bound and/or time-bound; and those with physical disabilities that prevent residence on campus. AZUN provides a high level of innovative student services that enable distance learning students to be successful in completing their chosen degree programs.

Arizona Universities Network offers students access to distance-delivered degrees and certificates through the public higher education system now and to meet increased demand in the future. Students can earn an undergraduate degree, graduate degree, or professional certification from one of the three state universities. AZUN also serves students who seek non-degree options and those taking classes for personal or professional enrichment.

Students benefit from the many options offered by AZUN:

- Access to easily transferable classes from all three state institutions
- Wide selection of accredited degree programs offered online
- Ease of cross-institution enrollment once admitted to a participating AZUN university
- Ability to select a degree or non-degree track, with a full- or part-time course load
- Automatic transfer of credits earned from the provider institution to the student's home institution
- Flexible learning formats providing anywhere, anytime access
- Consultation via email or phone with a home-institution coordinator when selecting classes or a program of study
- Payment of one tuition bill for classes taken at all three participating institutions
- Use of financial aid for classes taken through AZUN
- Graduation with a degree or certification conferred by the student's home institution

September 1, 2007

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Fred Hurst  
Vice President for Extended Programs  
and Dean for Distance Learning  
Northern Arizona University

# PERFORMANCE ANALYSIS

METRICS (\$ in millions)	FY 05 Proj	FY 05 Act	FY 06 Proj	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY 09 Proj
<b>Workforce Contributions</b>								
<b>Potential New Students Served</b>								
Teachers <sup>1</sup>	20	11	100	40	200	209	315	331
Nurses <sup>1</sup>	10	73	80	42	60	92	63	66
Fire Science Baccalaureate Completers	-	-	In Progress <sup>2</sup> 50	In Progress <sup>2</sup>	50	In Progress <sup>2</sup>	53	55
Law Enforcement Baccalaureate Completers	-	-	In Progress <sup>2</sup> 50	In Progress <sup>2</sup>	50	16	53	55
<b>Curriculum Innovations</b>								
Degree/Certificate Programs (new)	9(4)	9(6)	9(4)	9(3)	9(4)	9(3)	9(4)	9(4)
Regional/National Global Access	-	yes	-	yes	-	yes	-	-
New/Revised Courses <sup>1</sup>	5	30	40	16	30	27	30	30
<b>Partnerships/Collaborations</b>								
Community College Partners	17	17	15	19	19	19	19	19
K-12 Partners (schools/districts)	127	127	30	127	127	127	127	127
Out-of-State Partners	0	0	1	0	1	0	1	1
<b>Growth Indicators</b>								
Students Cross-Registering (home and provider enrollments per academic year) <sup>3</sup>	250	331	400	370	400	379	420	441
Web Course Completion Rates <sup>4</sup>	TBD	TBD	TBD	91%	-	91%	-	-
Enrollment System-Wide in Electronically-Delivered Courses (on and off campus) <sup>5</sup>	42,799	40,615	44,000	49,523	58,500	64,939	61,425	64,496
Number of Electronically-Delivered Courses (on and off campus) <sup>5</sup>	1,715	1,170	1,800	1,860	2,200	2,362	2,310	2,426
Number of Electronically-Delivered Programs System-Wide	45	49	48	56	58	89	61	64
Number of New Enrollments System-Wide	TBD	-	TBD	8,908	9,000	15,416	9,450	9,923
Satisfaction and Quality Measures (Experience Rated as Good or Very Good) <sup>6</sup>	TBD	TBD	TBD	91%	-	Mean = 7.2	-	-

<sup>1</sup> FY 2006 actuals adjusted to reflect changes identified during the review and standardization of reporting processes.

<sup>2</sup> Currently recruiting faculty, building courses and structuring program for online delivery.

<sup>3</sup> Students are counted in courses at both home and provider institutions.

<sup>4</sup> Reflects NAU completion rates only; information unavailable for ASU and UA.

<sup>5</sup> FY 2005 Actuals revised to reflect academic year numbers only for reporting consistency.

<sup>6</sup> New survey tool implemented in FY 2007 to benchmark student satisfaction reporting; scale 1-10 with 10 being very satisfied.

## PERFORMANCE ANALYSIS

### Program Development: FY 2007 Objectives and Accomplishments

Nursing: Additional cohorts established with Tucson Medical Center. Enrollments climbed from 10 students to 44 students during FY 2007.

Teacher Education: The Early Childhood Education and the B. S. Elementary Teacher Education are now active and growing. A combined enrollment of 116 students are being served in the Elementary Education program through the Central Valley and Tucson areas, and the Early Childhood program currently has 32 students enrolled at the Paradise Valley location.

Fire Science and Law Enforcement: The Northern Arizona University Bachelor of Applied Science in Administration of Justice program saw enrollment of 16 students for this newly approved program. Two faculty positions are currently being searched to support the Bachelor of Applied Science in Fire Science program. Courses within these programs are being developed for online delivery.

Nurse Educator Program (NED): The third and final year of the project was successful with the objectives of the grant having been met. The 15 credit nurse educator certificate program has been approved and courses offered 3 times. A Master's in Nursing Education has been created with mapped pathways to ASU's new DNP and PhD programs. A total of 11 students will have completed the NED series with an additional 39 students currently enrolled. A web log was launched and has been very effective in monitoring and documenting student practicum activities. The use of PDAs in instruction was met with mixed success - some students have reported actively using them in their teaching practice; while others do not plan to continue using them as their work environment is not supportive. A more extensive orientation is planned this coming fall and will have integrated hands-on PDA experiences in all of the NED classes.

SOLISTIC— Secondary Online Integrated Science Teacher Certification Program: Two math courses have been developed with one course piloted during Spring 07 and the second course piloted during Summer 07. Although recruitment for the Fall 06 program (13 initially w/ 3 drops) was lower than anticipated, the cohort expanded by additional Spring 07 enrollments (4 new students). AEPA Professional Knowledge pre-test scores improved over past cohort scores (70% avg vs. 62% avg).

ARRO (Arizona Regents Reach Out) Grants: Two grants were awarded during FY 2007 utilizing AZUN funding: 1) MethOIDE (Methamphetamine and Other-Illicit-Drug Education) - Online Program for Medical/Health Students and Professionals (UA); 2) Tribal Financial Managers Certificate Program (ASU). Progress reports will be made through the ARRO reporting process.

## FINANCIAL INFORMATION

	FY 2005 Budget	FY 2005 Actual	FY 2006 Budget	FY 2006 Actual	FY 2007 Revised Budget	FY 2007 Actual	FY 2008 Revised Budget	FY 2009 Budget
<b>REVENUE</b>								
Carry Forward	\$1,615,559	\$1,615,559	\$2,531,942	\$2,534,652	\$3,115,813	\$3,115,813	\$2,938,105	\$2,070,021
New TRIF Revenue	\$1,228,962	\$1,228,962	\$2,031,000	\$2,034,906	\$2,142,705	\$2,142,705	\$2,260,550	\$2,384,880
<b>TOTAL REVENUE</b>	<b>\$2,844,521</b>	<b>\$2,844,521</b>	<b>\$4,562,942</b>	<b>\$4,569,558</b>	<b>\$5,258,518</b>	<b>\$5,258,518</b>	<b>\$5,198,655</b>	<b>\$4,454,901</b>
<b>OPERATING BUDGET</b>								
Personal Services	\$798,925	\$2,232	\$1,460,141	\$264,920	\$1,086,139	\$721,011	\$973,664	\$1,069,176
ERE	\$208,958	\$751	\$501,924	\$79,611	\$316,393	\$236,840	\$281,407	\$311,843
All Other Operating	\$807,659	\$306,886	\$2,600,877	\$1,109,214	\$2,655,800	\$1,362,562	\$1,873,563	\$3,073,882
<b>TOTAL EX-PENDITURES</b>	<b>\$1,815,542</b>	<b>\$309,869</b>	<b>\$4,562,942</b>	<b>\$1,453,745</b>	<b>\$4,058,332</b>	<b>\$2,320,413</b>	<b>\$3,128,634</b>	<b>\$4,454,901</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a six-tenths-cent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## PERFORMANCE ANALYSIS

### Program Development Continued...

#### Development and Delivery of Shortened-Format Web Courses:

A total of 49 web courses were offered in the new 7-week format during FY07, with 9 being new course developments. Courses were representative of a range of university academic programs at both the undergraduate and graduate levels.

#### Development and Delivery of High Capacity Undergraduate

Web Courses: Approaches and support mechanisms have been developed to ensure high capacity in critical Web-delivered courses, including high capacity in single-section courses with lead faculty supported by graduate teaching assistants; multiple sections of the same course taught by qualified instructors under the mentoring and supervision of regular faculty; and enrollment management strategies for Web sections to maximize available capacity. The number of high capacity sections offered grew from 138 to 170.

#### Continue the Development of Competency-Based and

Experiential Learning: Competency-based and experiential learning allows students to receive credit for life experience towards degree or certificate completion. Career and technical education, as well as nursing, accept non-credit training and professional experience in lieu of having students complete courses that would be redundant with their prior training and experience. Impediments to expansion of competency-based and experiential learning include a lack of administrative infrastructure, academic standards, and cost implications.

### Infrastructure: FY 2007 Objectives and Accomplishments

AZUN Portal Project: The AZUN Web portal project was designed to interconnect the universities' student information systems (SISs) to provide automated admissions, registration, tuition/fee payments and financial aid information for current and prospective students interested in taking courses from the three universities.

Phase I of the Portal replicated the functions of the original AZUN Web site (course and degree search with articulation information) and implemented the online admissions function. Completion was achieved in December of 2006. A draft plan is under consideration by the Board to delay implementation of Phase II of the Portal until the number of students using AZUN to cross-register among the universities increases to 1,000 per semester. Until that time, the universities believe that it is more cost effective to manually cross-register students.

The universities will continue to monitor the student services provided by the AZUN Portal to ensure seamless and efficient operation. Technical staff at the AZUN and universities levels will continue to meet to enhance the Portal's capacities and to prepare to develop new functionalities.

## LEARN MORE

Contact Fred Hurst, Vice President for Extended Programs and Dean for Distance Learning, at [Fred.Hurst@nau.edu](mailto:Fred.Hurst@nau.edu), or 928-523-6598. Or Visit the AZUN website at <http://www.azun.net>.

### Infrastructure continued...

Student Services: AZUN prospective and current students are assisted by telephone and email with admissions, enrollment, payment, and other student services. Contact was made to remind students to enroll, to assist with completing payments as well as to assist web students with email, and accessing their class. Assistance was also provided to prospective students to help them navigate to the institution of their choice (NAU, ASU, UA). Advising capacity for on-line degrees was increased by two full-time and one part-time advising resource in FY07, which allowed for a 28% increase in student contact. An increased number of students are using the chat services offered on the website, and the average satisfaction of students using the tool is 4.5 on a 5 point scale, 5 being excellent.

Articulation: Each of the universities has tables published on the Course Applicability System (CAS) website to show equivalent classes at the other two institutions. Provider credits are automatically sent to the student's home institution and appear as transfer credits on the student's transcript. The community colleges and universities agreed to allow the AZUN Web Portal to access the CAS information and display it for students searching for electronically delivered classes.

Technology: A hardware fire wall solution has been implemented to improve security for the AZUN web site. A new Tandberg bridge, gatekeeper software and hardware, and class scheduling server have been purchased as a major upgrade to the ITV video conference network, and an all-digital ITV System at North Valley has been installed.

Marketing: A new advertising campaign was researched, designed and developed with the theme, "We'll meet at your place." The new campaign was rolled out in January, 2007. AZUN ads appeared in magazines and newspapers around Arizona, and on kiosks in Sky Harbor Airport, billboards in Phoenix, and transit shelters and malls in the Phoenix/Tucson area. Radio spots ran on stations KZON and KTAR, with additional underwriting for NPR stations from Flagstaff to Tucson. As in 2006, lead generation companies were contracted to provide a steady stream of new prospects for AZUN programs.

## MANAGEMENT

Programmatic oversight is in the NAU Distance Learning department of Northern Arizona University with the vice president for extended programs and dean of distance learning directly responsible for activities. Integration with ongoing operations helps ensure sustainability and provides a high level of coordination. The Arizona Board of Regents provides ultimate oversight.



The Arizona Board of Regents gateway to quality distance learning

# e - Learning



NORTHERN  
ARIZONA  
UNIVERSITY

September 1, 2007

## e - Learning

Northern Arizona University's e-Learning Initiative promotes effective and innovative use of information technology to support student learning, provide educational access, and develop technology skills among students and faculty.

NAU's e-Learning supports the TRIF initiative in the following ways:

- ◆ Educate faculty and students in methods and skills required by today's technology based workforce,
- ◆ Develops engaging and effective web-based and technology enhanced courses,
- ◆ Promotes a learning-centered approach to increase student success,
- ◆ Provides expanded access to pursuing an education regardless of students' locations.

The e-Learning Center works with faculty to evaluate emerging technologies and new teaching practices. Promising technologies, such as live web-based video conferencing, classroom response systems, and social software, including wikis, blogs, and podcasts, are incorporated into pilot courses, studied, assessed, and where appropriate, promoted across the curriculum.

The e-Learning Center's programs actively involve faculty and students in the use of technology. For example, as of fall 2006, the e-Learning Center and NAU's Information Technology Services (ITS) group collaborated to offer online access to course materials for every class taught at NAU. This approach allows faculty to provide students easy access to syllabi, readings, assignments, and grades, and it also gives students and faculty new and effective ways to communicate.

Other programs developed and supported by the e-Learning Center include: 1. ongoing faculty development events, such as round-table forums and focus groups, 2. quarterly showcases highlighting faculty achievements in the use of instructional technologies, and 3. the e-Learning Institute, an annual 3-day conference that promotes technology and learning centered "best practices" at NAU and colleges and universities in the southwest.

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*Don Carter,  
e-Learning Director*

# PERFORMANCE ANALYSIS

METRICS	FY 02 Proj	FY 02 Act	FY 03 Proj	FY 03 Act	FY 04 Proj	FY 04 Act	FY 05 Proj	FY 05 Act	FY 06 Proj	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY 09 Proj	FY 10 Proj	FY 11 Proj
<b>Work force Contributions</b>																
Number of new Web courses developed and offered	10	125	150	101/140	130	121	90	141	80	22/471	100	78	95	90	85	80
Number of new Hybrid courses developed											15	2 (c)	25	35	45	55
Number of new IT – enhanced courses developed	0	0	20	32	30	42	50	53	60	7	20	80	25	30	35	40
Number of courses redesigns											15	5	20	25	30	35
Number of faculty participating in Web development	25	150	175	117	190	155	120	126	120	241	200	325	225	250	300	350
Number of student enrollments in online courses	0	7,110	4,000	9,476	4,500	10,133	11,000	12,381	12,000	14,116	12,500	20,526	12,750	13,000	13,500	14,000
Number of student enrollments in hybrid courses											1,000	36 (A)	1,300	1,600	2,000	2,500
Number student enrollments in enhanced courses											2,000	2769	3,000	4,000	5,000	6,000
Increase student academic success in Web courses				5%	0	9%	5%	16%	5%	5.3% decrease	5%	5%	5%	5%	5%	5%
Increase in student success in enhanced & redesigned courses											5%	First Year Base-line	5%	5%	5%	5%
Percentage of students satisfied with Web learning	0	0	0	84%	85%	89.2%	90%	87%	90%	87%	91%	86% (B)	92%	93%	94%	95%
Number of graduates with technical literacy skills	0	1,500	1,750	889	2,000	1,633	1,500	1,919	1,500	2,238	2,000	1995	2,050	2,100	2,150	2,200
Number of graduates with advanced technical literacy skills											1,000	282	1,200	1,500	1,600	1,700
<b>Partnerships</b>																
Number of private sector partnerships	0	0	1	0	1	0	1	2	1	2	1	2	1	1	1	1
Number of scholarly publications/conference presentations											3	8	5	7	10	10

(A) This measures depend on course descriptors in the class schedule. These policies are currently in the approval process.  
 (B) 86% satisfied or very satisfied with web learning at NAU, 89% say NAU has successfully or very successfully integrated learning technology  
 (C) Of the 13,068 classes offered at NAU in FY07, 7,333 or 56% of them used the course shell for some class activities.

## PERFORMANCE ANALYSIS

Our e-Learning Initiative has a clear focus on workforce development. Enhancement of technological skills as a result of the technology integration across curriculums prepare NAU graduates for a knowledge and innovation based Arizona economy.

- ◆ Curriculum innovations are critical to developing students' technological skills. These innovations include the development and offering of new online courses, hybrid courses, and course redesign at the undergraduate level.
- ◆ Advances in student centered e-Learning occur through research and development (R&D) activities. The e-Learning Center's R&D efforts are reflected in support for faculty through innovation funds and a "best practice" laboratory. New technologies, teaching practices, and standards of quality centered on learning in a technological environment are core to the e-Learning Initiative.
- ◆ Increasing access to higher education for Arizona's citizens is a major goal for e-Learning. Through information and instructional technology, students who are time-restricted or place-bound, will be able to enroll in NAU courses and degree programs through improved University access.
- ◆ The e-Learning Center supports partnerships and collaborations between academic units and distance learning programs at NAU. For example, the e-Learning Center provides support for the creation and continuous improvement in online, hybrid, and on-site courses. Many of the online courses are offered through the Arizona Universities Network (AZUN).
- ◆ Impact of the e-Learning Initiative is measured by the number of students with enhanced and advanced

technical literacy skills. Multiple indicators (e.g., observations, questionnaires, test score data, interviews, etc.) are used to characterize the level of student technological skills.

- ⇒ DFW (Drop, Failure, Withdrawal) rates are one measure of course effectiveness. In 2007, the e-Learning Center measured a 5% DFW decrease rate.
- ⇒ A 45% percent increase in web course enrollment, providing greater educational access by time and place bound students.
- ⇒ As students and faculty embrace online access to course materials, the demand for hybrid and web-enhanced courses has increased. ELC's response has been to broaden support for all types of technology enhanced courses.
- ⇒ Eighty-four faculty new to teaching technology enhanced courses.
- ◆ Other programs developed and supported by the e-Learning Center include:
  - ⇒ Ongoing development support to faculty creating fully-online and hybrid courses
  - ⇒ Daily training opportunities for faculty in the use of course management tools and other instructional technologies
  - ⇒ Just-in-time technical support for faculty including Phone Help, email help, convenient satellite ELC offices, searchable Frequently Asked Questions on the ELC web site, and "Tech Buddies" (trained student workers) to help faculty troubleshoot problems.
  - ⇒ Review of fully-online and hybrid courses for technical quality and accessibility.

## FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Revised Budget	FY 2007 Actuals	FY 2008 Revised Budget	FY 2009 Budget	FY 2010 Budget	FY 2011 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$674,138	\$637,033	\$831,019	\$1,197,355	\$456,204	\$456,204	\$224,698	\$0	\$0	\$0
New TRIF Revenue	\$1,354,355	\$1,161,953	\$1,704,522	\$2,160,000	\$2,272,361	\$1,810,000	\$1,810,000	\$1,810,000	\$1,810,000	\$1,810,000	\$1,810,000
<b>TOTAL REVENUE</b>	<b>\$1,354,355</b>	<b>\$1,836,091</b>	<b>\$2,341,555</b>	<b>\$2,991,019</b>	<b>\$3,469,716</b>	<b>\$2,266,204</b>	<b>\$2,266,204</b>	<b>\$2,034,698</b>	<b>\$1,810,000</b>	<b>\$1,810,000</b>	<b>\$1,810,000</b>
<b>OPERATING BUDGET</b>											
Personal Services	\$567,521	\$1,103,269	\$1,310,577	\$1,525,599	\$1,697,066	\$1,729,924	\$1,729,924	\$1,729,924	\$1,608,092	\$1,608,092	\$1,608,092
Operating	\$112,696	\$95,789	\$199,959	\$470,437	\$1,316,446	\$311,582	\$311,582	\$304,774	\$201,908	\$201,908	\$201,908
<b>TOTAL EXPENDITURES</b>	<b>\$680,217</b>	<b>\$1,199,058</b>	<b>\$1,510,536</b>	<b>\$1,996,036</b>	<b>\$3,013,512</b>	<b>\$2,041,506</b>	<b>\$2,041,506</b>	<b>\$2,034,698</b>	<b>\$1,810,000</b>	<b>\$1,810,000</b>	<b>\$1,810,000</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## MANAGEMENT

The e-Learning Center is managed by the Director of e-Learning, Don Carter, who reports to Dr. Karen Pugliesi,

## ADVISORY BOARDS

The e-Learning Center is guided by two advisory boards, one internal and one external. The Internal Advisory Board consists of administrative and faculty leaders on campus who have vested interest in the success and implementation of the Initiative.

### Internal Advisory Board Members:

Don, Carter, e-Learning Center Director  
 Linda Shadiow, Faculty Development Director  
 Bob Larson, School of Forestry  
 Larry Gould, Associate Dean, Social & Behavioral Sciences  
 Pin Ng, Associate Professor Economics, Business Administration  
 Tim Smith, College of Arts & Letters  
 Paul Morgan, College of Engineering & Natural Sciences  
 Ric Wigall, College of Education  
 Sherry Markel, Council of Chairs  
 Patrick Deegan, Associate Dean, Distance Learning  
 John Campbell, Director Academic Computing, ITS

The External Advisory Board is composed of three members who are leaders in the field of e-Learning and who provide guidance and national perspective on teaching and learning using technology.

### External Advisory Board Members:

Steve Carlson, WL GORE, Medical Products Division  
 Dr. Phil Long, Senior Strategist, MIT, Boston, MA.  
 Dr. Judith Boettcher, Consultant/Principal, Designing for Learning, Executive Director of CREN from 1997-2003, Corporation for Research and Educational Networking.

The e-Learning Faculty Committee, composed of the faculty who serve on the internal advisory board, is responsible for recommending baseline learning outcomes, addressing standards, selecting courses for redesign, and reviewing internal grant projects.

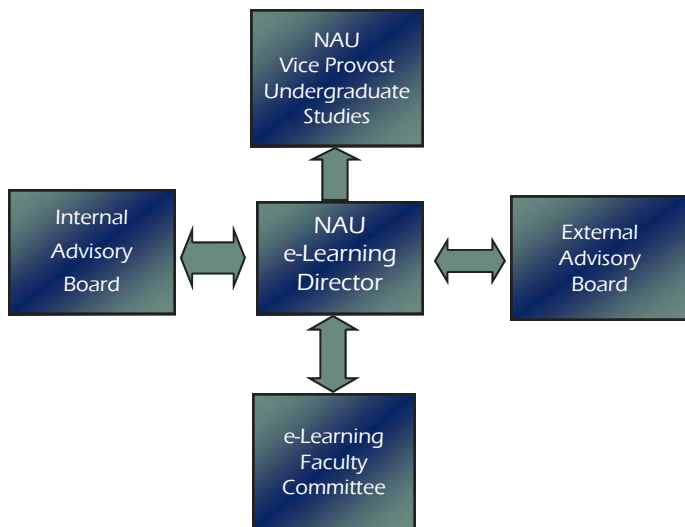
### e-Learning Faculty Committee:

Bob Larson, School of Forestry  
 Larry Gould, Associate Dean, Social & Behavioral Sciences  
 Pin Ng, Associate Professor Economics, Business Administration  
 Tim Smith, College of Arts & Letters  
 Paul Morgan, College of Engineering & Natural Sciences  
 Ric Wigall, College of Education

## GOALS

The "e" in e-Learning means more than electronic or online courses. The "e" includes our ability to create engaging, effective, and efficient teaching and learning environments. NAU's goals include:

- ◆ Increase NAU's capacity to serve local and distance students by bringing affordable and convenient courses to those who cannot attend classes on campus or need more schedule flexibility.
- ◆ Use learner centered principles and information technology to accommodate varied teaching and learning styles, providing motivation and support for continued student success.
- ◆ A guarantee that ALL students who graduate from NAU, regardless of their entering preparation, are technically literate and prepared for a lifetime of learning.
- ◆ Establish NAU as a leader in applying e-Learning practices to enhance educational quality and access.



## LEARN MORE

Contact Don Carter, Director of the NAU e-Learning Initiative, at [don.carter@nau.edu](mailto:don.carter@nau.edu), or 928-523-1605. Or visit the e-Learning Center website at <http://www.nau.edu/elearning>

**NORTHERN  
ARIZONA  
UNIVERSITY**



ENVIRONMENTAL RESEARCH, DEVELOPMENT,  
AND EDUCATION FOR THE NEW ECONOMY  
(ERDENE)



NORTHERN  
ARIZONA  
UNIVERSITY

September 1, 2007

**ERDENE**

Long-term environmental and human health depends on ecological understanding, economic vitality and social values. Environmental Research, Development, and Education for the New Economy (ERDENE) integrates ecological understanding, business acumen and technological ingenuity to sustain the health of our environment and the vitality of our communities.

ERDENE focuses on Northern Arizona University's (NAU) environmental research strengths in five major areas including ecological restoration, water resources, renewable energy technologies, applied research for sustaining rural communities, and comprehensive monitoring and management of complex systems.

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NAU Faculty and Students  
Working on Wind Turbines in Northern Arizona

ERDENE applies ecological research and knowledge to lessen human impact on the natural world, mitigate previous actions detrimental to our natural heritage, and stimulate economic and community development. The program promotes environmental, economic and community health by addressing real problems in innovative ways.



Dr. Gary Deason  
ERDENE Director

# PERFORMANCE ANALYSIS

METRICS (\$ in millions)	FY02 Proj	FY02 Act	FY03 Proj	FY03 Act	FY04 Proj	FY04 Act	FY05 Proj	FY05 Act	FY06 Proj	FY06 Act	FY07 Proj	FY07 Act	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<u>Return on Investment</u>																
Federal and State Funds	\$4.5	\$5.5	\$4.3	\$4.3	\$4.3	\$4.4	\$5.7	\$12.9	\$6.3	\$3.3	\$5.0	\$8.3	\$3.9	\$4.2	\$4.5	\$4.8
Industrial Dollars	\$0.10	\$0.40	\$0.10	\$0.40	\$0.10	\$0.50	\$0.10	\$0.50	\$0.20	\$0.10	\$0.20	\$0.07	\$0.30	\$0.40	\$0.40	\$0.50
Other Dollars	\$0.20	\$0.60	\$0.20	\$0.30	\$0.20	\$0.50	\$0.30	\$0.50	\$0.30	\$0.40	\$0.50	\$0.40	\$0.60	\$0.70	\$0.80	\$0.90
Qualitative Returns Including Presentations & Publications	10	121	120	180	120	138	130	305	27	119	150	221	150	160	170	180
<u>Technology Transfer</u>																
Products Generated and in the Marketplace	0	0	0	0	0	49	0	6	2	12	3	5	3	6	8	10
Business Spinoffs	0	1	1	0	1	1	1	1	2	1	0	4	0	1	2	3
Patent Applications Generated	0	1	1	0	1	0	1	0	2	0	0	1	1	2	3	4
Conferences Sponsored	0	14	15	19	15	21	17	28	8	26	3	21	5	10	15	20
Business Expansions	2	2	2	1	3	5	4	16	8	5	0	4	1	2	3	4
<u>Work Force Contributions</u>																
Graduate/Postdoc Students in Pipeline or Graduated	35	56	50	87	56	102	60	35	61	38	65	32	62	65	68	70
High End Baccalaureates in Specific Disciplines	23	38	33	27	38	47	45	23	84	15	8	3	6	6	6	6
Baccalaureates Produced in Related Disciplines	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	50	15	42	45	48	50
Certificates Granted	0	0	5	0	5	3	7	73	8	0	5	0	5	5	5	5
Undergrad Students in Pipeline	0	26	30	126	32	63	35	40	35	45	50	78	55	60	65	70
Continuing Ed Professionals	0	85	85	312	85	1361	90	142	46	265	250	42	130	140	150	160
<u>Specific Curriculum Innovations</u>																
New Programs such as Certificates (full time students)	5	3	5	1	6	1	6	0	9	2	0	2	1	1	1	1
Revised Courses	5	10	6	14	6	16	8	22	9	6	2	6	3	4	4	4
New Courses (full time students)	5	2	7	9	10	29	10	31	15	12	2	5	2	3	3	3
New Programs -- Participating Professionals	0	0	0	0	0	0	0	0	0	9	0	4	2	2	2	2
<u>Partnerships</u>																
Community College 2+2 Programs	2	2	3	9	3	7	4	8	5	8	2	6	4	6	8	10
Tri-University (ASU, NAU, UofA)	4	4	3	6	3	7	4	10	5	9	5	2	8	12	15	18
Industry/Private Sector Collaborations	13	17	18	73	18	58	24	79	27	48	35	55	38	40	42	45
Community-based (including tribes)	8	34	25	58	30	51	30	60	46	76	35	78	38	40	42	45
Regional, Nat'l, International Research and Linkages	5	20	20	41	22	54	25	72	15	69	35	75	38	40	42	45
<u>Companies identifying the university as a reason to relocate</u>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3

## PERFORMANCE ANALYSIS

- ERDENE will focus its efforts on securing new funding in five areas: ecological restoration, renewable energy technologies, rural and tribal community development, water resource management, and environmental monitoring.
- Technology transfer performance covers a broad spectrum of activities including patents, spin-off companies, products, and business expansions. A significant measure of ERDENE's technology transfer productivity is through sponsored conferences and workshops for business, industry, and government agencies.
- ERDENE works closely with Flagstaff businesses and civic organizations to develop and recruit new sustainable resource based companies to northern Arizona.
- Workforce contributions are measured by undergraduate and graduate students in the pipeline or graduated with degrees or certificates relevant to area and the number of continuing education professionals participating in training programs offered through ERDENE.
- ERDENE supports student research and critical skill development to enhance preparedness for Arizona's workforce opportunities.

- ERDENE collaborations are measured by the number of partnerships with community colleges, universities, industries, communities, and regional/national/international organizations.



Students and Faculty from the Ecological Restoration Institute on a forest restoration field trip.

## FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Revised Budget	FY 2007 Actual	FY 2008 Revised Budget	FY 2009 Budget	FY 2010 Budget	FY 2011 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$175,540	\$224,067	\$254,812	\$476,956	\$667,386	\$667,386	\$571,614	\$0	\$0	\$0
New TRIF Revenue	\$1,450,500	\$1,551,412	\$1,681,405	\$1,977,600	\$2,080,472	\$1,872,092	\$1,872,092	\$1,961,282	\$1,872,092	\$1,872,092	\$1,872,092
<b>TOTAL REVENUE</b>	<b>\$1,450,500</b>	<b>\$1,726,952</b>	<b>\$1,905,472</b>	<b>\$2,232,412</b>	<b>\$2,557,428</b>	<b>\$2,539,478</b>	<b>\$2,539,478</b>	<b>\$2,532,896</b>	<b>\$1,872,092</b>	<b>\$1,872,092</b>	<b>\$1,872,092</b>
<b>OPERATING BUDGET</b>											
Personal Services	\$1,062,225	\$1,260,419	\$1,426,244	\$1,639,348	\$1,425,694	\$1,902,726	\$1,902,726	\$2,383,597	\$1,759,766	\$1,759,766	\$1,759,766
Operating	\$212,735	\$242,466	\$224,416	\$259,376	\$464,348	\$65,138	\$65,138	\$149,299	\$112,326	\$112,326	\$112,326
<b>TOTAL EXPENDITURES</b>	<b>\$1,274,960</b>	<b>\$1,502,885</b>	<b>\$1,650,660</b>	<b>\$1,898,724</b>	<b>\$1,890,042</b>	<b>\$1,967,864</b>	<b>\$1,967,864</b>	<b>\$2,532,896</b>	<b>\$1,872,092</b>	<b>\$1,872,092</b>	<b>\$1,872,092</b>
<b>ROI *</b>	<b>5.1 : 1</b>	<b>3.4 : 1</b>	<b>3.0 : 1</b>	<b>7.2 : 1</b>	<b>2.0 : 1</b>	<b>1.7 : 1</b>	<b>3.0 : 1</b>	<b>3.1 : 1</b>	<b>3.2 : 1</b>	<b>3.3 : 1</b>	<b>3.4 : 1</b>

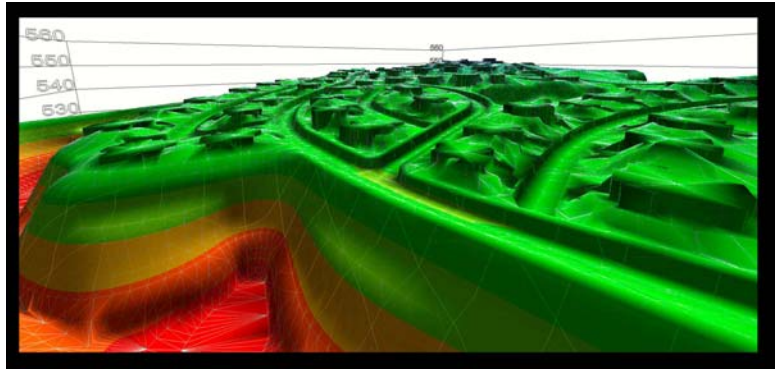
\* New ROI methodology used in FY 2007, and will continue to be used for all future years. This is an ABOR requested calculation change from FY 2002-2006.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

ERDENE goals specifically include:

- ◆ Promote environmental, economic and community health through research, outreach, and education.
- ◆ Address Arizona’s environmental and economic issues with a focus on sustainable systems.
- ◆ Support initiatives with specific environmental, economic and social benefits to Arizona citizens.
- ◆ Continue to identify and capture new funding to further the economic development of Arizona.



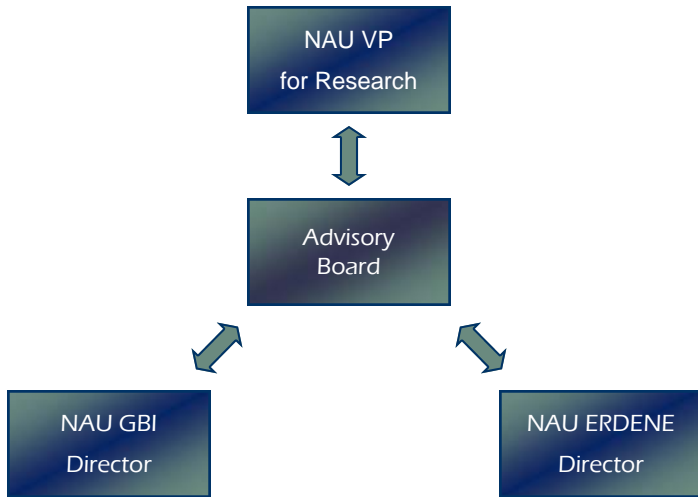
*Wind Resource Modeling*

## ADVISORY BOARD

A new Research and Development Advisory Board has been formed to oversee Growing Biotechnology (GBI) and Environmental Research, Development, and Education for the New Economy (ERDENE) initiatives. This board consists of deans, faculty, and people from off campus with expertise in environmental and biotechnology.

## MANAGEMENT

ERDENE director, Dr. Gary Deason, reports through the Center for Sustainable Environments to Dr. Lee Drickamer, Vice President for Research (Interim) and Regents’ Professor, for TRIF related activities.



**Michael Bittner**

Translational Genomics Research Institute

**Will Ott and Tom Rainey**

Northern Arizona Technology and Business Incubator

**Barry Gold**

Gordon and Betty Moore Foundation

**Laura Huenneke**

NAU College of Engineering and Natural Sciences

**David LaRoche**

U.S. Environmental Protection Agency

**Edwin Lewis**

NAU Department of Chemistry and Biochemistry

**Stephanie McKinney**

Greater Flagstaff Economic Council

**Mary O’Connell**

New Mexico State University Plant and Environmental Science Department

**Thomas Whitham**

NAU Department of Biological Sciences

## LEARN MORE

Contact Dr. Gary Deason, ERDENE Director, at the Center for Sustainable Environments at Gary.Deason@nau.edu, or 928-523-4889, or visit any of the following websites to learn more about individual initiatives:

- ◆ Center for Sustainable Environments <http://www.environment.nau.edu>
- ◆ Sustainable Energy Solutions <http://ses.nau.edu>
- ◆ Ecological Restoration Institute <http://www.eri.nau.edu/cms/>
- ◆ Merriam Powell Center for Environmental Research <http://www.mpcer.nau.edu/smallindex.html>

**NORTHERN ARIZONA UNIVERSITY**



# GROWING BIOTECHNOLOGY INITIATIVE (GBI)



**NORTHERN ARIZONA UNIVERSITY**

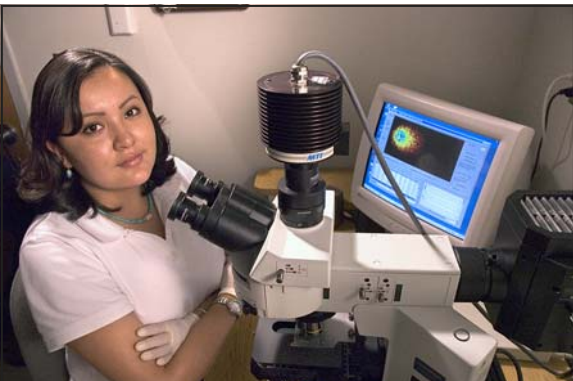
September 1, 2007

## GROWING BIOTECHNOLOGY

The Growing Biotechnology Initiative (GBI) enables outstanding interdisciplinary research and development in biosciences, biotechnology, and bioengineering at Northern Arizona University (NAU) to be translated rapidly and effectively to address critical health, technology, and education issues essential for the Arizona New Economy.

GBI, and its associated center SABRE (Strategic Alliance for Bioscience Research and Education) will continue its focus on research in new and emerging areas in the biosciences, including infectious diseases, medical instrumentation, forensic genetics, cancer, musculoskeletal and cardiopulmonary rehabilitation, endocrine systems, biomaterials, and respiratory failure. It is also expanding specific funding opportunities for product development based on research that has been previously funded.

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Advisory Boards	4
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*Monica Yazzie, an undergraduate student studies the role of heavy metals in cancer biology.*

Research areas supported by GBI and SABRE focus primarily on strategic initiatives identified in the revised 2007 Arizona Bioscience Roadmap, and specifically areas to be identified in the forthcoming Northern Arizona Bioscience Roadmap.

GBI's vision is to position Arizona as a global leader in the fast-growing biotechnology industry through research, technology transfer, business recruitment, and workforce development.

An emphasis on student participation at both undergraduate and graduate levels in research, combined with the high productivity of university researchers, gives NAU a unique position in Arizona to provide cutting-edge research while providing education and workforce development at all levels for the growing bioscience and biotechnology industries in the State of Arizona.



*Dr. Tim Porter, Director Growing Biotechnology (GBI)*

# PERFORMANCE ANALYSIS

METRICS (\$ in millions)	FY 02 Proj	FY 02 Act	FY 03 Proj	FY 03 Act	FY 04 Proj	FY 04 Act	FY 05 Proj	FY 05 Act	FY 06 Proj	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY 09 Proj	FY 10 Proj	FY 11 Proj
<u>Return on Investment</u>																
External Funding Federal, State & Local	\$1.4	\$1.4	\$1.5	\$6.3	\$2.0	\$5.6	\$2.0	\$1.3	\$1.5	\$4.2	\$2.5	\$4.1	\$2.8	\$3.1	\$3.4	\$3.7
External Funding Other	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	\$0.9	\$0.3	\$0.05	\$0.5	\$0.5	\$1.0	\$1.0
Number of Scholarly Publications	7	12	15	0	18	59	20	3-8	20	47	20	65	30	30	40	40
<u>Technology Transfer</u>																
Patent Applications Generated	2	1	1	2	1	2	1	1	1	3	2	1	2	2	2	2
Products Generated and in the Marketplace	0	0	1	5	1	0	1	2	1	1	1	0	2	1	2	2
Business Expansions	0	0	2	0	2	0	2	2	1	1	1	1	1	1	1	1
Technology Transfer: startup companies created	0	0	0	2	0	1	0	0	0	1	0	1	1	0	0	1
Industry Partnerships	0	0	0	2	0	2	2	2	3	8	1	4	1	2	1	2
<u>Economic Development</u>																
Incubation/Formation of Biotech Concerns in Flagstaff/Northern Arizona	0	0	1	0	1	0	2	2	1	2	0	0	0	1	1	2
<u>Work Force Contributions</u>																
Graduate/Postdoc Students in Pipeline	57	60	60	62	60	60	60	25	70	29	10	26	20	20	25	30
Undergraduate Students with Research Experience	76	80	80	79	80	43	65	53	75	90	70	41	80	100	110	125
M.S./Ph.D. Graduate Increases	2	1	3	12	3	5	3	8	5	10	3	0	3	3	3	3
<u>Specific Collaborations</u>																
New Research Collaborations	4	6	6	29	6	3	1	17	2	28	2	13	2	5	5	7

## PERFORMANCE ANALYSIS

- TRIF funds will be leveraged as a result of anticipated new dollars received from agencies, industry, and business.



Environmental Genomics and Genetics Laboratory

- Technology transfer measures are based largely on the development and licensing of new technologies and products. GBI will provide specific grant support to faculty for intellectual property development.
- GBI works closely with the City of Flagstaff and the Northern Arizona Technology and Business Incubator to assist in the incubation, formation, and recruitment of biotechnology companies to northern Arizona.

- Workforce development is a major emphasis area for GBI. Recruiting undergraduate and graduate students into the bioscience pipeline and preparing

them for the biotechnology workforce is a high priority.

- GBI is committed to developing new partnerships with industry, business, universities, national laboratories, and governmental agencies. The number of new collaborations and partnerships in joint research ventures is expected to increase over the next five years as the bioscience industry in Arizona continues to grow.
- Selected accomplishments this previous year include genetic studies into drought and pest resistance in Arizona forests, development and business formation related to cell signaling and its relation to disease pathways, acquisition of instrumentation for isotopic analysis, and mass spectrometry to be used for research and student training, and studies related to respiratory failure.



## FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Revised Budget	FY 2007 Actual	FY 2008 Revised Budget	FY 2009 Budget	FY 2010 Budget	TFY 2011 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$363,216	\$510,270	\$18,410	\$353,276	\$341,247	\$341,247	\$333,179	\$0	\$0	\$0
New TRIF Revenue	\$967,002	\$1,123,132	\$817,501	\$768,000	\$807,951	\$913,880	\$913,880	\$538,360	\$913,880	\$913,880	\$913,880
<b>TOTAL REVENUE</b>	<b>\$967,002</b>	<b>\$1,486,348</b>	<b>\$1,327,771</b>	<b>\$786,410</b>	<b>\$1,161,227</b>	<b>\$1,255,127</b>	<b>\$1,255,127</b>	<b>\$871,539</b>	<b>\$913,880</b>	<b>\$913,880</b>	<b>\$913,880</b>
<b>OPERATING BUDGET</b>											
Personal Services	\$216,402	\$377,561	\$706,203	\$696,382	\$345,031	\$519,548	\$519,548	\$604,398	\$630,577	\$630,577	\$630,577
Operating	\$387,384	\$598,517	\$603,157	\$67,366	\$474,949	\$402,400	\$402,400	\$267,141	\$283,303	\$283,303	\$283,303
<b>TOTAL EXPENDITURES</b>	<b>\$603,786</b>	<b>\$976,078</b>	<b>\$1,309,360</b>	<b>\$763,748</b>	<b>\$819,980</b>	<b>\$921,948</b>	<b>\$921,948</b>	<b>\$871,539</b>	<b>\$913,880</b>	<b>\$913,880</b>	<b>\$913,880</b>
<b>ROI *</b>	<b>2.3 : 1</b>	<b>6.4 : 1</b>	<b>4.2 : 1</b>	<b>1.8 : 1</b>	<b>6.2 : 1</b>	<b>2.2 : 1</b>	<b>9.8 : 1</b>	<b>10.2 : 1</b>	<b>10.4 : 1</b>	<b>10.6 : 1</b>	<b>10.6 : 1</b>

\* New ROI methodology used in FY 2007, and will continue to be used for all future years. This is an ABOR requested calculation change from FY 2002-2006.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

GBI will foster biotechnology innovation, discovery, technology transfer, and workforce development.

Specific goals include:

- ◆ Facilitate technology transfer including patents, licenses, and new businesses based in the biosciences.
- ◆ Work closely with the City of Flagstaff and the Northern Arizona Technology and Business Incubator in recruiting and developing new biotechnology business in Northern Arizona.
- ◆ Create and refine courses in biotechnology and related fields to provide the training and experience NAU graduates will need to be productive members of Arizona’s biotechnology workforce
- ◆ Create and maintain partnerships with government, business, and research institutions. Focus on our relationships with University of Arizona and Arizona State University to build the State’s bioscience capacity.



The NAU Greenhouse

## MANAGEMENT

GBI’s director, Dr. Tim Porter, reports to Dr. Lee Drickamer, Vice President for Research (Interim) and Regents’ Professor . For TRIF related activities. Research initiatives within GBI report to Dr. Porter.

## ADVISORY BOARD

A new Research and Development Advisory Board has been formed to oversee Growing Biotechnology and Environmental Research, Development, and Education for the New Economy (ERDENE) Initiatives. This board will consist of deans, faculty, and people from off campus, with expertise in environmental biotechnology areas.

**Michael Bittner**

Translational Genomics Research Institute

**Will Ott and Tom Rainey**

Northern Arizona Technology and Business Incubator

**Barry Gold**

Gordon and Betty Moore Foundation

**Laura Huenneke, Dean**

NAU College of Engineering and Natural Sciences

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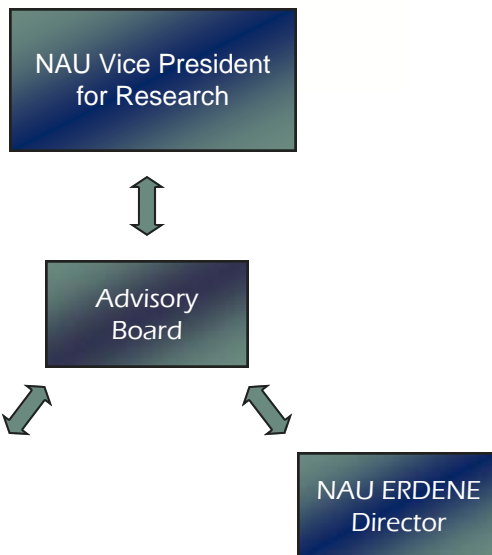
**Mary O’Connell**

New Mexico State University  
Plant & Environmental Science

**Thomas Whitham**

NAU Regents’ Professor,  
Dept of Biological Sciences

**NORTHERN ARIZONA UNIVERSITY**



## LEARN MORE

Contact Dr. Tim Porter at the Department of Physics at [Tim.Porter@nau.edu](mailto:Tim.Porter@nau.edu), or call (928) 523-2540.

# HEALTHCARE PROGRAM EXPANSION



NORTHERN ARIZONA UNIVERSITY

September 1, 2007

## Healthcare Program Expansion

Health Care Program Expansion directly supports Arizona Board of Regents initiatives for health workforce planning. In addition, Northern Arizona University's request responds to the Joint Conference Committee (JCC) recommendations to provide convenient, affordable access to baccalaureate education throughout the state. These programs will complement the professional medical / health program degrees offered by UA, ASU, and the new College of Medicine in Phoenix. In FY 2007, NAU leased a building just off Interstate-17 in the Phoenix area. The building consolidates all of NAU's current operations in Maricopa County and permits NAU leadership to begin implementing the first strategy of their Health Care Program Expansion Plan.

According to Stephen N. Collier, PhD, Director and Professor, Office of Health Professionals Education and Workforce Development, The University of Alabama at Birmingham, "Most states in the U.S. are experiencing significant shortages of health professionals. Arizona is no exception. Because the physicians workforce determines much of what happens in the overall health care system, other health professional groups are often overlooked." They include a variety of disciplines, some of which are currently offered by Northern Arizona University, and others that could be added to our program portfolio. To fully develop this initiative will require long-term state support, student tuition and fee adjustments, and contributions from NAU's regular TRIF allocation.

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## STRATEGIES AND GOALS

This college realignment plan not only advances an important strategic initiative for the university and the state, but also opens the door to further interdisciplinary collaboration.

*John D. Haeger, NAU President, March 2007  
Liz Grobsmith, Provost and Vice President for Academic Affairs*

The goal of this project is to expand access to and availability of Health Care Education in Arizona. Northern Arizona University has a three-part strategy for helping to address the need for health care professionals in Arizona:

1. Enhance existing programs at Flagstaff where it results in increases in the number of health care professionals,
2. Make existing programs directly available in metropolitan and rural areas of Arizona to increase the number of health care professionals,
3. Institute new programs in health care disciplines currently underserved by existing public university programming.

The TRIF over-attainment dollars currently allocated to NAU will allow the university to make progress on the first two of these strategies. A source of ongoing support is required to continue progress, and an investment of significant additional funds will be required in order to make progress on the third.

**STRATEGY 1: Enhance existing programs at Flagstaff where it results in increases in the number of health care professionals.**

Supports Four ABOR Strategic Planning Goals:

1. Increase Student Participation in University Education,
2. Enhance the Quality of Student Education,
3. Increase Affordable Education for Students,
4. Provide an Educated Competitive Workforce.

**Goal #1: Increase capacity in the Flagstaff-based entry-level Doctor of Physical Therapy (DPT) program**

The current entry-level Doctorate of Physical Therapy (DPT) program admits a cohort of 44 students annually. In FY 2007, Northern Arizona University prepared to expand the number of students entering the Fall 2007 cohort by hiring one full-time faculty member and investing in equipment and space on the Flagstaff campus. NAU leadership believe this was the most economical way to produce additional licensed physical therapists.

**Goal #2: Implement a health sciences degree completion program for students with Associate in Applied Science (AAS) degrees in technical health care areas.**

Northern Arizona University currently has a degree completion program in conjunction with Gateway Community College's Diagnostic Medical Imaging Training AAS degree. The university received an Arizona Regents Reaching Out (ARRO) grant to investigate expansion of this program to graduates of other technical programs. In 2007, a search committee was formed to hire one faculty and staff member to implement the planning completed through the AARO grant. Significant progress was also made building community college partnerships, allowing NAU to move forward with an expanded program by Fall 2007. AAS graduates can now augment their education, and obtain a bachelor's degree with this on-line program on the Flagstaff campus.

**Goal #3: Stabilize and expand the existing master's degree in clinical speech pathology.**

Speech Pathologists continue to be in demand throughout Arizona. In FY 2007, Northern Arizona University moved forward by hiring a clinic director and conducted a search for their new faculty line. NAU leadership is preparing to expand this master's program by Fall 2008. NAU also developed a plan to establish a Master's in Communication Sciences & Disorders on the NAU Yuma campus. Pre-requisite classes will begin

## STRATEGIES AND GOALS

*Continued from page 2*

in Fall 2007, to prepare students interested for Fall 2008 program entry. These changes will increase the number of students it can accept into this program.

**Goal #4: Increase capacity in the Flagstaff-based Athletic Training program**

In FY 2007, Northern Arizona University hired one full-time faculty member, and have expanded the bachelor's-level program in Athletic Training from 16 students annually, to 24 students by Fall 2007. Given the solid base of faculty and facilities currently available on the Flagstaff campus, this is the most economical way to produce additional athletic trainers.

**STRATEGY 2: Make existing programs directly available in metropolitan and rural areas of Arizona to increase the number of health care professionals in these areas.**

**Supports Four ABOR Strategic Planning Goals:**

1. Increase Student Participation in University Education,
2. Enhance the Quality of Student Education,
3. Increase Affordable Education for Students,
4. Provide an Educated Competitive Workforce.

**Goal #1: Relocate the existing Post-Professional Doctor of Physical Therapy Program to Phoenix.**

In FY 2007, the Post-Professional Doctor of Physical Therapy Program was relocated to Phoenix and one full-time faculty member was hired. The program is building and transitioning seamlessly in NAU's new I-17 facility. The Post-Professional DPT program is a 36 credit hour program that enable licensed professionals to attain doctoral status. Relocating the program to Phoenix has had two major benefits: (1) it makes doctoral education more easily accessible to the large population of physical therapists in a major metropolitan area, and (2) it will provide a platform for development of a Phoenix-based cohort for the entry-level DPT program, to be implemented in phase #2 of our planned health-care program expansion.

By achieving these goals,

Northern Arizona University will:

- allow more students to participate in an affordable, public-university based program,
- enhance the education they will receive, and
- expand the number of health care professionals in the Arizona workforce

**Goal #2: Expand the existing Dental Hygiene completion program to include either a hybrid or face-to-face cohort program in Phoenix.**

In FY 2007, Northern Arizona University recruited and hired one full-time faculty member who will be located in Phoenix. NAU leadership has begun program development to begin their first cohort in Spring 2008. Northern Arizona University provides an on-line dental hygiene bachelor's completion program – the first of its kind in the nation. By locating a faculty member in Phoenix, the university can institute a face-to-face or hybrid program to make bachelor-completion education accessible to the large population of dental hygienists in that major metropolitan area. Several of the Maricopa Community College District schools offer the AAS in Dental Hygiene; and Northern Arizona University continues to build partnerships with these schools to offer their students additional education.

**Goal #3: Expand the existing nursing cohort in Tucson and establish a new cohort-based program in partnership with the Yuma Regional Medical Center.**

In FY 2007, NAU leadership continued to expand their nursing program in Tucson. In addition, Northern Arizona University's School of Nursing strategically partnered with Yuma Regional Medical Center, Arizona Western College, and statewide program personnel to investigate the feasibility of a four year nursing program in Yuma. Northern Arizona University has already built successful nursing satellite programs on the Navajo Reservation and in Tucson, and with additional investment could double the number of students educated annually in Tucson and develop a similar program in Yuma.

# FINANCIAL INFORMATION

## Strategy 1:

Program	ENROLLMENTS								DEGREE AWARDS			
	One Time Costs	Recurring Costs, Staff (inc ERE)	Recurring Costs									
				FY08	FY09	FY10	FY11	FY09	FY10	FY11	FY12	
Physical Therapy	\$158,000	\$80,000	\$7,000	8	16	24	24		5	8	8	8
Health Sciences Bachelor's Completion Program	\$50,000	\$130,000	\$29,000	10	20	30	40		10	15	25	35
Communication Sciences & Disorders	\$33,000	\$170,000	\$14,000	10	20	20	20		5	10	15	20
Athletic Training	\$15,000	\$80,000	\$10,000	8	16	24	24		8	8	8	8
<b>TOTALS</b>	<b>\$256,000</b>	<b>\$460,000</b>	<b>\$60,000</b>	<b>36</b>	<b>72</b>	<b>98</b>	<b>108</b>		<b>28</b>	<b>41</b>	<b>56</b>	<b>71</b>

## Strategy 2:

Program	ENROLLMENTS								DEGREE AWARDS			
	One-Time Costs	Recurring Costs, Staff (inc ERE)	Recurring Costs									
				FY08	FY09	FY10	FY11	FY09	FY10	FY11	FY12	
Transfer Post-Professional Doctorate of Physical Therapy to Phoenix	\$40,000	\$80,000	\$24,000	8	16	20	20		8	15	18	18
Create In-Person Dental Hygiene Completion Program in Phoenix	\$100,000	\$210,000	\$50,000	10	20	30	30		10	15	20	25
Expand Nursing in Tucson	\$26,000	\$160,000	\$14,000	40	40	40	40		20	37	37	37
New Nursing Program in Yuma	\$330,000	\$160,000	\$114,000	10	20	40	40		5	15	35	35
<b>TOTALS</b>	<b>\$496,000</b>	<b>\$610,000</b>	<b>\$202,000</b>	<b>68</b>	<b>96</b>	<b>130</b>	<b>130</b>		<b>43</b>	<b>82</b>	<b>110</b>	<b>115</b>

*"Northern Arizona University's health professions expansion initiative meets the public agenda and an extraordinary state need"*

*John D. Haeger, NAU President, October 2006*

In April 2007, the Arizona Board of Regents (ABOR) unanimously approved an organizational realignment at Northern Arizona University that created a new College of Health and Human Services. The new college combines NAU's current schools of Nursing and Health Professions. Search committees have already been appointed for an Executive Director of Nursing and for a Dean of the new college. ABOR approved \$2.15 M in TRIF funding to expand existing health care programs in physical therapy and nursing. In addition, the State of Arizona's FY 2008 budget includes an additional \$4 M to create new health professions programs to combat shortages in several fields.

Northern Arizona University has responsibly hired new faculty members to expand Physical Therapy, Athletic Training, and Communication Sciences & Disorders Programs on the Flagstaff campus. Faculty have also been hired for the health profession programs being transferred and expanded in Phoenix. Expanded Phoenix programs include Post Professional Doctorate of Physical Therapy, Dental Hygiene and Health Sciences Completion Programs.

**NORTHERN  
ARIZONA  
UNIVERSITY**



## LEARN MORE

Contact Dr. MJ McMahon, Executive Vice President, at [mj.mcmahon@nau.edu](mailto:mj.mcmahon@nau.edu), or 928-523-6515. <http://jan.ucc.nau.edu/~hp-p/>

# STATEWIDE EXPANSION



NORTHERN ARIZONA UNIVERSITY

September 1, 2007

## NAU's STATEWIDE EXPANSION

Northern Arizona University has a long history of providing Arizonans with access to higher education in their home communities. While NAU remains committed to bringing educational opportunities to rural Arizonans where they live and work, the need for access is equally important in urban areas for specific academic programs addressing workforce needs and the different demographics presented by non-traditional students.

With Board approval the University has entered into a long-term lease of a high profile commercial building on I-17 between Bell and Greenway Roads. Signage will be clearly visible from I-17 to the north, south, and east. This will be an anchor facility



NAU's New Phoenix—North Valley Facility

- consolidating existing offices and academic programs,
- serving as a platform to expand existing and launch new academic programs in high demand workforce development areas such as nursing, doctorate of physical therapy, dental hygiene, teacher education, and
- providing advanced training for managers in rapidly growing non-profit and business fields.

The TRIF funds will be used for lease payments, furniture, fixtures, and equipment (FF&E) including high speed data connections for voice, video, and data, as well as other information technology equipment. The University will move all offices and classrooms from leased space in the current facilities at Third Street and Thomas. Programs throughout the Valley and in Tucson will be coordinated by staff located in this facility.

The allocated and requested TRIF funding will be used to establish a lasting NAU presence in Maricopa County.

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### Statewide Expansion Supports Five of ABOR's Strategic Plan Goals:

1. Increase Student Participation in University Education
2. Enhance the quality of Student Education
3. Increase Affordable Education for Students
4. Provide an Educated, Competitive Workforce
6. Optimize University Resource Acquisition and Work Environment

## CURRENT AND FUTURE ACADEMIC PROGRAMS

The University has been working with Paradise Valley Community College for a number of years to reduce the amount of space we utilize on their campus so that they have the space needed for their rapidly growing programs. We will move most of our offices and classrooms from their campus to the I-17 facility.

This facility will be used to expand existing and launch new health care programs also funded by the Board from the over-attainment TRIF funds. Relocating Post-Professional Doctor of Physical Therapy to the I-17 facility for fall of 2007 will:

1. make doctoral education more easily accessible to the large population of physical therapists in the state's major metropolitan area and
2. provide a platform for development of a Phoenix-based cohort for the entry-level DPT program, targeted for Fall 2008.



The University also plans to expand the existing Dental Hygiene completion program to include a hybrid or face-to-face cohort program at the I-17 facility for Spring 2008. Professional Dental Hygiene associations are lobbying for the Bachelor of Dental Hygiene to become the standard educational qualification for entry into the field. In addition, many students with an Associate in Applied Science degree (AAS) welcome the opportunity to augment their degree with education that leads to a bachelor's degree. Northern Arizona University provides an online dental hygiene bachelor's completion program – the first of its kind in the nation. However, not all students find online education to be the most effective approach to learning. By locating two faculty members in Phoenix, the University can institute a face-to-face or hybrid program to

make bachelor's completion education more easily accessible to the large population of dental hygienists in the state's major metropolitan area. Several of the Maricopa County Community College District schools offer the Associate in Applied Science degree (AAS) in Dental Hygiene; Northern Arizona University proposes to partner with these schools to offer their students additional education, and technical training that is a part of the Bachelor of Science in Dental Hygiene (BSDH) in Flagstaff.

In 2008, with Board and legislative support, Northern Arizona University intends to expand the unique Health Science 2+2 degree completion program at the I-17 facility to include Respiratory Care, Physical Therapy Assisting, Surgical Technology, Paramedic Care, and Medical Assisting. In partnership with the Maricopa County Community College District, students will move seamlessly from their associate degree to a Northern Arizona University bachelor's degree—continuously or returning after working in the field. Also under consideration for offering in 2008 are the MS in Health Sciences and the Speech/Language Pathology Assistant certificate.

The expansion of these health programs in the I-17 facility illustrates the ideal synergy of the Board allocations funding both the facility infrastructure costs as well as the development and delivery costs for new health care programs.

Looking to 2009 and beyond, with needed support, the University is exploring programs for Physician Assistants, Occupational Therapy, Family Nurse Practitioner, and other high demand healthcare fields. Working with ASU and community college partners, the University plans to complement and expand existing program options for students while providing desperately needed healthcare workers to ensure the enhanced quality of life Arizonans expect.

There is also a strong synergy with other TRIF funded projects such as the Arizona Universities Network (AZUN) and the University's allocation of original TRIF funds to our Access and Workforce Development (AWD) Initiative. The academic program foci of AZUN and AWD require space for faculty and staff to deliver online, hybrid, and classroom based programs to students.

Several of the University's Maricopa County Community College partners have expressed an interest in offering classes in the facility. Students could seamlessly move from their associate degree to a bachelor completion while continuing to attend classes at the same building.

CURRENT AND FUTURE ACADEMIC PROGRAMS

North Valley Program Planning

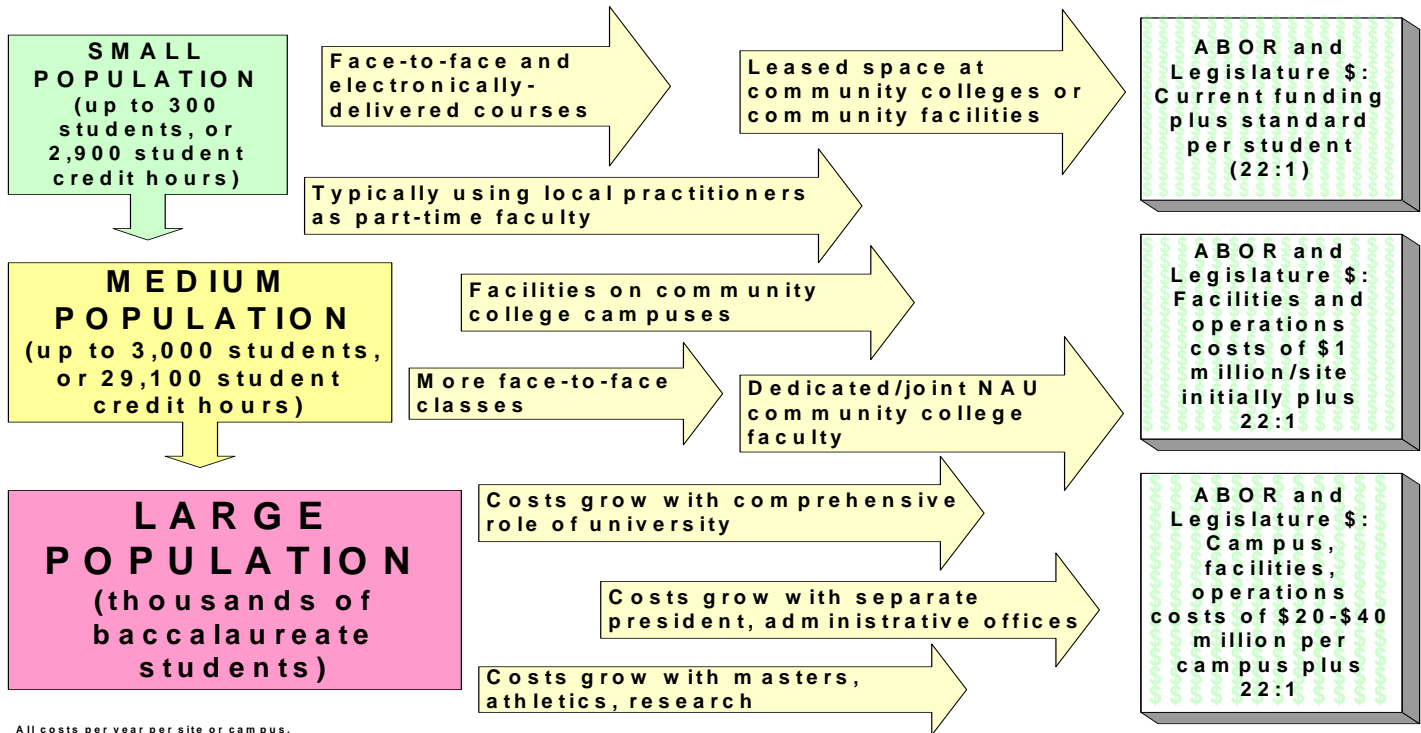
2017			Potential Additions in 2018			Potential Additions in 2019		
Location	Program	Students	Location	Program	Students	Location	Program	Students
<b>Undergraduate Programs</b>								
I-17 Sts	ES Career/Technical Education	25			30			30
I-17 Sts	EALS Sociology	10			20			20
I-17 Sts	EALS Organizational Communication	10			20			25
I-17 Sts	ES Dental Hygiene Degree Completion	10			20			30
GCC	ES Elementary Education	16			26			26
GCC	ES Speech Communication	10			20			25
GWCC	ES Health Science DMT	35			40			40
			I-17 Sts	BS Administration of Justice	15			20
			I-17 Sts	BS Early Childhood Education	16			20
			I-17 Sts	BS Interior Design	15			20
			I-17 Sts	BS Health Science: 5 Tracks	15			30
			I-17 Fin	Bachelor of Administration	20			30
			I-17 Sts or GCC	BS Fire Science	15			25
			I-17 Sts	Bachelor of Interdisciplinary Studies	30			40
						I-17 Sts	BS Occupational Therapy	15
						I-17 Sts	BS Psychology	20
<b>Graduate Programs</b>								
I-17 Sts	MEd Educational Leadership plus certification	180			175			200
I-17 Sts	MEd Elementary Education - GPE	40			50			50
I-17 Sts	MEd Early Childhood Education	20			30			30
I-17 Sts	MEd Secondary Education - GPE	8			12			20
I-17 Sts	MEd Counseling Human Relations	30			40			40
I-17 Sts	MEd School Counseling	95			40			40
I-17 Sts	MA Community Counseling	30			30			30
I-17 Sts	MA English	15			20			20
I-17 Sts	Doctor of Physical Therapy	8			16			20
			I-17 Sts	Master of Administration	15			20
			I-17 Sts	MEd Elementary Education plus certification	20			25
			I-17 Fin	MEd Special Education	20			25
			I-17 Sts	MS Health Sciences	20			30
						I-17 Sts	MSN Family Nurse Practitioner	10
						I-17 Sts	MA Applied Communication	15
						I-17 Sts	MS Physician Assistant	10
<b>Certificate Programs</b>								
			I-17 Sts	Professional Writing	8			12
			I-17 Sts	Public Management	12			16
			I-17 Sts	Speech/Lang Pathology Assistant	8			16
<b>TOTAL</b>		<b>481</b>			<b>618</b>			<b>642</b>

Programs in blue require approval and development online. Programs in purple have been developed and offered either in Flagstaff or online.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## EXPAND ON DEMAND

As student and employer demand increases (from about 300 to 3,000 students), permanent state funded debt service facilities are constructed on jointly shared community college campuses (similar to the Northern Arizona University and Arizona Western College shared campus in Yuma). Where our community college partners do not have the ability or desire to co-locate, Northern Arizona University will build stand alone facilities. As student demand reaches critical mass (3,000 or more students) a branch campus will be developed. This strategy is the least costly with the added benefit of spreading the state investment over many years. Northern Arizona University has the enrollment in the greater Maricopa County Valley to justify the strategies identified in the "Medium Population" category in the Expand on Demand model. At our current student enrollment growth rate, the University will move into the "Large Population" category creating the need for future campus facilities.



## FINANCIAL INFORMATION

In April 2007, the Arizona Board of Regents (ABOR) unanimously approved an organizational realignment at Northern Arizona University that created a new College of Health and Human Services. The new college combines NAU's current schools of Nursing and Health Professions. Search committees have already been appointed for an Executive Director of Nursing and for a Dean of the new college. ABOR approved \$2.15 M in TRIF funding to expand existing health care programs in physical therapy and nursing. In addition, the State of Arizona's FY 2008 budget includes an additional \$4 M to create new health professions programs to combat shortages in several fields.

New faculty members have been hired to expand Physical Therapy, Athletic Training, and Communication Sciences & Disorders Programs on the Flagstaff campus. Faculty have also been hired for the health profession programs being transferred and expanded in Phoenix. Expanded programs include Post-Professional Doctorate of Physical Therapy, Dental Hygiene, and the Health Sciences Completion Program.

"Northern Arizona University's health professions expansion initiative meets the public agenda and an extraordinary state need"

*John D. Haeger, NAU President, October 2006*



## LEARN MORE

Contact Fred Hurst, Vice President for Extended Programs, and Dean of Distance Learning, at [fred.hurst@nau.edu](mailto:fred.hurst@nau.edu), or 928-523-6598. [www.nau.edu/distance](http://www.nau.edu/distance)

# UNIVERSITY INITIATIVES



NORTHERN  
ARIZONA  
UNIVERSITY

September 1, 2007

## NORTHERN ARIZONA UNIVERSITY INITIATIVES

Today's rapidly evolving, competitive, and dynamic world requires nations, states, and universities to be flexible, responsive, and innovative within a very short time frame. NAU is prepared for the opportunities and challenges of this environment by setting aside funds for university initiatives and scenarios that may arise.

As with all NAU TRIF initiatives, these funds will be directed to meet the goals of the TRIF legislation and state economic development priorities. It is anticipated that investments will be made within the general context of the four NAU TRIF business plans focused on access/workforce development, E-learning, biotechnology and environmental research,

### Contents

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*Dr. John Haeger, President  
Northern Arizona University*

*NAU's New Hotel and Conference Center  
Expected Completion: April 2008*

# PERFORMANCE ANALYSIS



Exterior of New Laboratory Facility

Occupied: January, 2007

Interior of New Laboratory Facility

Occupied: January, 2007



Existing Health Professions Bldg.  
New Health Professions Bldg is in  
Initial Planning Phase

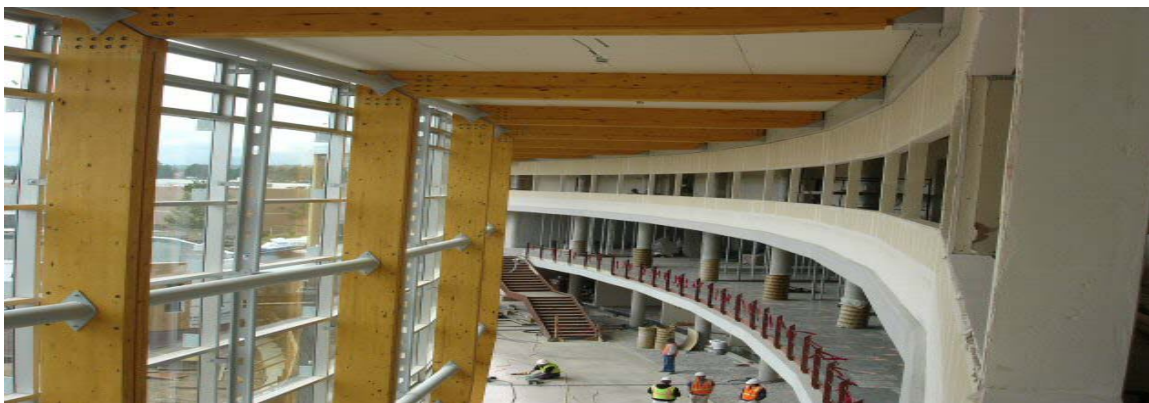
Expected Completion: FY 2010

# PERFORMANCE ANALYSIS



Applied Research and Development Bldg

Occupied: April 2007



# FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Revised Budget	FY 2007 Actual	FY 2008 Revised Budget	FY 2009 Budget	FY 2010 Budget	FY 2011 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$206,744	\$664,608	\$1,522,437	\$3,054,612	\$5,159,771	\$5,159,771	\$293,790	\$0	\$0	\$0
TRIF Revenue	\$298,203	\$590,810	\$938,517	\$2,552,961	\$1,764,371	\$690,000	\$690,000	\$1,432,058	\$1,626,521	\$2,133,760	\$2,668,895
<b>TOTAL REVENUE</b>	<b>\$298,203</b>	<b>\$797,554</b>	<b>\$1,603,125</b>	<b>\$4,075,398</b>	<b>\$4,818,983</b>	<b>\$5,849,771</b>	<b>\$5,849,771</b>	<b>\$1,725,848</b>	<b>\$1,626,521</b>	<b>\$2,133,760</b>	<b>\$2,668,895</b>
<b>OPERATING BUDGET</b>											
Personal Services	\$36,174	\$72,666	\$62,927	\$385,155	\$340,462	\$310,432	\$153,992	\$484,212	\$345,519	\$364,523	\$384,574
Operating	\$55,285	\$60,280	\$17,761	\$43,618	-\$681,250	\$379,568	\$483,950	\$1,241,636	\$1,281,002	\$1,769,237	\$2,284,321
Building Renovation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Conference Center	\$0	\$0	\$0	\$0	\$0	\$2,000,000	\$2,000,000	\$0	\$0	\$0	\$0
Debt Service	\$0	\$0	\$0	\$0	\$0	\$3,159,771	\$2,918,039	\$0	\$0	\$0	\$0
<b>TOTAL EXPENDITURES</b>	<b>\$91,459</b>	<b>\$132,946</b>	<b>\$80,688</b>	<b>\$428,773</b>	<b>-\$340,788</b>	<b>\$5,849,771</b>	<b>\$5,555,981</b>	<b>\$1,725,848</b>	<b>\$1,626,521</b>	<b>\$2,133,760</b>	<b>\$2,668,895</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

# GOALS

University Initiatives will provide coordinated oversight of all NAU TRIF Initiatives. This oversight will support our established programs, and ensure flexibility to respond to new demands. Our overall goal is to provide infrastructure that enables a coordinated and integrated approach to research, education, connections with business and practical applications in the face of our changing economy. Specifically we will:

- ◆ Support the Applied Research and Development Building, a showcase for our commitment to sustainability.
- ◆ Support the biology and chemistry laboratory building to meet the rapidly expanding needs of our Growing Biotechnology initiative.
- ◆ Support efforts to expand allied health care program options beyond NAU’s campus for Arizona’s citizens.
- ◆ Construct new Health Professions Building, which has been significantly affected by the success of our Access/Workforce Development Initiative.
- ◆ Complete a conference center and hotel complex, which will expand our academic reputation throughout the nation, and will demonstrate our commitment to sustaining and improving economic and community relationships.
- ◆ Continue to strengthen partnership between Translational Genomics Research Institute (TGen North) and NAU, where several joint and adjunct faculty members staff the facility and graduate students are trained.
- ◆ Continue to improve science facilities and broaden faculty research opportunities to compete for Science Foundation Arizona Grants.

*“At Northern Arizona University, our TRIF University Initiatives provide benefits that vary from enhancement of economic relationships with the Flagstaff community and increased attention to the great need for health professionals, to the infrastructure for advanced research in molecular and ecological sciences.”*

*Lee Drickamer, Ph.D.,  
Vice President for Research (Interim) and Regents’ Professor*

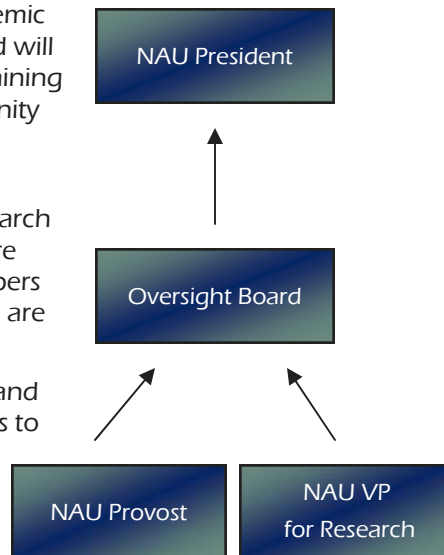


# OVERSIGHT BOARD

The NAU TRIF Oversight Board will provide general direction and guidance to the President regarding NAU’s TRIF programming including University Initiatives.

Oversight Board Membership:

- Paul Begovac**  
W.L. GORE & Associates, Inc.
- Sandra Johnson, Chair**  
Flinn Foundation
- Julie Pastrick**  
Flagstaff Chamber of Commerce
- Gary Smith**  
Unisource
- Carl Taylor**  
Coconino County Board of Supervisors
- Nat White**  
Lowell Observatory



# MANAGEMENT

NAU President, Dr. John D. Haeger, oversees University Initiative activities. He is assisted in this effort by the Oversight Board, Provost and Vice President for Research. Appropriate Vice Presidents and Deans will also participate in specific projects.

# LEARN MORE

Contact: Dr. Lee Drickamer, Vice President for Research (Interim) and Regents’ Professor, at [Lee.Drickamer@nau.edu](mailto:Lee.Drickamer@nau.edu) or 928-523-0388.

**NORTHERN ARIZONA UNIVERSITY**

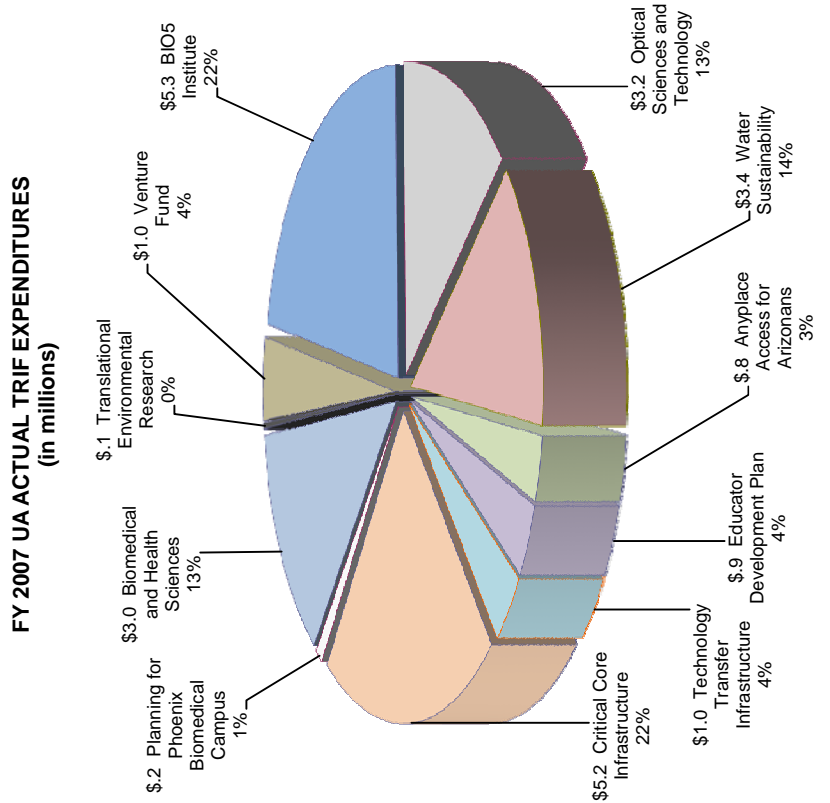


**THE UNIVERSITY OF ARIZONA**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
**FY 2007 ACTUAL / FY 2008 - 2011 BUDGETS**  
**SUMMARY**

	<b>FY 2007 REVISED BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 REVISED BUDGET</b>	<b>FY 2009 BUDGET</b>	<b>FY 2010 BUDGET</b>	<b>FY 2011 BUDGET</b>
<b>REVENUE</b>						
Carryforward	\$ 6,812,073	\$ 6,812,073	\$ 8,026,022	\$ -	\$ -	\$ -
TRIF Revenue	25,351,822	25,351,822	26,702,289	28,344,559	29,704,019	31,317,268
<b>TOTAL REVENUE</b>	<b>\$ 32,163,895</b>	<b>\$ 32,163,895</b>	<b>\$ 34,728,311</b>	<b>\$ 28,344,559</b>	<b>\$ 29,704,019</b>	<b>\$ 31,317,268</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services	\$ 14,510,913	\$ 8,486,483	\$ 17,561,368	\$ 13,575,619	\$ 14,449,820	\$ 15,523,352
ERE	4,487,916	2,606,677	5,233,887	4,046,134	4,306,648	4,626,559
All Other Operating	7,474,990	8,410,706	5,946,435	4,838,871	4,802,699	4,747,239
<b>TOTAL OPERATING BUDGET</b>	<b>26,473,819</b>	<b>19,503,866</b>	<b>28,741,690</b>	<b>22,460,624</b>	<b>23,559,167</b>	<b>24,897,150</b>
<b>CAPITAL BUDGET</b>						
Building Renovation	269,007	169,007	350,000	-	-	-
Debt Service	5,421,069	4,465,000	5,636,621	5,883,935	6,144,852	6,420,118
<b>TOTAL CAPITAL BUDGET</b>	<b>5,690,076</b>	<b>4,634,007</b>	<b>5,986,621</b>	<b>5,883,935</b>	<b>6,144,852</b>	<b>6,420,118</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 32,163,895</b>	<b>\$ 24,137,873</b>	<b>\$ 34,728,311</b>	<b>\$ 28,344,559</b>	<b>\$ 29,704,019</b>	<b>\$ 31,317,268</b>
<b>SUMMARY BY INITIATIVE</b>						
BIO5 Institute	\$ 6,980,867	\$ 5,288,883	\$ 7,579,796	\$ 5,087,812	\$ 5,087,812	\$ 5,087,812
Optical Sciences and Technology	3,782,078	3,187,607	4,350,138	3,275,667	3,275,667	3,275,667
Water Sustainability	4,544,628	3,405,987	4,709,768	3,246,106	3,246,106	3,246,106
Anyplace Access for Arizonans	1,027,141	832,903	1,393,632	1,030,394	1,030,394	1,030,394
Educator Development Plan	1,092,420	948,541	1,007,696	813,817	813,817	813,817
Technology Transfer Infrastructure	999,748	966,919	858,039	825,210	825,210	825,210
Critical Core Infrastructure	5,249,069	5,186,186	5,677,504	5,711,935	5,972,852	6,248,118
Planning for Phoenix Biomedical Campus	750,000	211,146	538,854	-	-	-
Biomedical and Health Sciences:						
Expansion of Phoenix Biomedical Campus	2,145,000	2,009,192	2,208,808	2,073,000	1,973,000	1,973,000
ASU-UA Joint Biomedical Research Fund	1,000,000	187,472	1,312,528	500,000	500,000	500,000
Arizona Clinical and Translational Research	1,000,000	74,051	1,825,949	700,000	600,000	750,000
McKnight Brain Institute	1,250,500	396,763	1,023,737	800,000	800,000	800,000
College of Nursing Online Programs	350,000	345,462	305,538	240,000	300,000	350,000
Translational Environmental Research	790,822	67,918	1,229,088	311,883	506,761	543,676
Venture Fund	1,201,622	1,028,843	707,236	3,728,735	4,772,400	5,873,468
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 32,163,895</b>	<b>\$ 24,137,873</b>	<b>\$ 34,728,311</b>	<b>\$ 28,344,559</b>	<b>\$ 29,704,019</b>	<b>\$ 31,317,268</b>

**THE UNIVERSITY OF ARIZONA**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
**FY 2007 BUDGET / ACTUAL**  
**SUMMARY BY PROGRAM AREA**

	FY 2007 REVISED BUDGET	FY 2007 ACTUAL
<b>REVENUE</b>		
Carryforward	\$ 6,812,073	\$ 6,812,073
TRIF Revenue	25,351,822	25,351,822
<b>TOTAL REVENUE</b>	<b>\$ 32,163,895</b>	<b>\$ 32,163,895</b>
<b>EXPENDITURES</b>		
<b>OPERATING BUDGET</b>		
Personal Services	\$ 14,510,913	\$ 8,486,483
ERE	4,487,916	2,606,677
All Other Operating	7,474,990	8,410,706
<b>TOTAL OPERATING BUDGET</b>	<b>26,473,819</b>	<b>19,503,866</b>
<b>CAPITAL BUDGET</b>		
Building Renovation	269,007	169,007
Debt Service	5,421,069	4,465,000
<b>TOTAL CAPITAL BUDGET</b>	<b>5,690,076</b>	<b>4,634,007</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 32,163,895</b>	<b>\$ 24,137,873</b>
<b>SUMMARY BY INITIATIVE</b>		
BIO5 Institute	\$ 6,980,867	\$ 5,288,883
Optical Sciences and Technology	3,782,078	3,187,607
Water Sustainability	4,544,628	3,405,987
Anyplace Access for Arizonans	1,027,141	832,903
Educator Development Plan	1,092,420	948,541
Technology Transfer Infrastructure	999,748	966,919
Critical Core Infrastructure	5,249,069	5,186,186
Planning for Phoenix Biomedical Campus	750,000	211,146
Biomedical and Health Sciences	5,745,500	3,012,940
Translational Environmental Research	790,822	67,918
Venture Fund	1,201,622	1,028,843
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 32,163,895</b>	<b>\$ 24,137,873</b>



**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)**

**TRIF PROGRAM**

**THE UNIVERSITY OF ARIZONA.**

Arizona's First University.

September 1, 2007



**THE UNIVERSITY OF ARIZONA TRIF PROGRAM**



The Technology and Research Initiative Fund (TRIF) is a special investment in higher education made possible by the passage of a special ballot proposition (Education 2000, also known as Proposition 301) by Arizona voters in November 2000. Proceeds from a six-tenths of a cent increase in state sales tax are apportioned

(for 20 years from the passage of Proposition 301) to statewide education at all levels. The TRIF portion of the revenues is shared with the state's public universities, each of which invests their allocations differently. At the University of Arizona, TRIF funds support creative research efforts in critical high-technology areas, translation of research results to clinical or commercial application, and education of a workforce prepared for the knowledge-based economy of the 21st Century. Some of our funds specifically support creation of specialized research facilities, enhancement of technology transfer infrastructure, and distance-learning activities that serve important community needs.

Current research-intensive initiatives include: the BIO5 Institute, the McKnight Brain Institute, Optical Sciences and Technology, Translational Environmental Research, Water Sustainability, and biomedical research done collaboratively with Arizona State University.

Educational initiatives include: Anyplace Access for Arizonans, the Educator Development Plan, expansion of the Phoenix Biomedical Campus, and on-line degree and certificate programs of the College of Nursing.

Foundational support for multiple initiatives goes to: development for the Arizona Clinical and Translational Research and Educational Consortium, Critical Core Infrastructure, and Technology Transfer Infrastructure.

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*Eugene G. Sander  
Executive Vice President  
and Provost*



*Leslie P. Tolbert  
Vice President for Research,  
Graduate Studies, and  
Economic Development*

## PERFORMANCE ANALYSIS

### SELECTED KEY METRICS\*

	FY 02 Proj	FY 02 Actual	FY 03 Proj	FY 03 Actual	FY 04 Proj	FY 04 Actual	FY 05 Proj	FY 05 Actual	FY 06 Proj	FY 06 Actual	FY 07 Proj	FY 07 Actual	FY 08 Proj	FY 09 Proj	FY 10 Proj	FY 11 Proj	
<b>GRANTS/GIFTS/CONTRACTS RECEIVED</b>																	
ACIST		\$1.12 M		\$5.034 M		\$5.4 M		\$3.81 M		\$2.06 M							
Anyplace Access		\$3,000		\$327,000		\$372,000		\$945,000	\$1.0 M	\$848,000	\$1.11 M	\$3.45M	\$1.22M	\$1.33 M	\$1.44 M	\$1.55 M	
BIO5	\$2 M	\$1.4 M	\$4 M	\$12.6 M	\$6 M	\$25.1 M	\$8 M	\$25.5 M	\$25 M	\$27.1 M	\$28.6 M	\$35.37M	\$28.7 M	\$28.8 M	\$28.9 M	\$29 M	
Educator Develop Plan						\$25,000		\$2,225 M		\$3,115 M							
McKnight Brain Institute											\$1.885 M	\$1.885M	\$1.885 M	\$2.22 M	\$2.42 M	\$2.62 M	
Nursing Online															\$500,000	\$500,000	
Op Sci & Technology		\$11.325 M		\$3.398 M		\$19.94 M		\$2.428 M		\$9,677 M	\$16 M	\$21.74M	\$16.35 M	\$16.7 M	\$17.05 M	\$17.4 M	
Trans Env. Research											\$50,000	\$71,195	\$610,000	\$815,000	\$1.32 M	\$1.725 M	
Water Sustainability		\$400,000		\$332,700		\$800,000		\$440,000		\$413,700	\$12.2 M	\$10.52M	\$11.2 M	\$9.6 M	\$9.6 M	\$9.6 M	
<b>WORKFORCE CONTRIBUTIONS</b>																	
<i>Number of certificate/undergraduate/graduate degrees awarded</i>																	
Anyplace Access											9	69	69	68	125	130	135
Nursing Online Programs											47	39	48	53	56	60	
<i>Number graduate/continuing education students</i>																	
Anyplace Access					20	19	40	37	143	385	267	267	377	400	410	420	
Nursing Online Programs											169	152	181	191	197	205	
<i>Number of teachers certified</i>																	
Educator Develop Plan		43		50		64		76		60	85	85	87	94	95	95	
<b>TECHNOLOGY TRANSFER/INDUSTRIAL COLLABORATIONS</b>																	
<i>Licenses &amp; invention disclosures</i>																	
BIO5			132		63	70	90	70	63	26	34	29	32	35	36		
Trans Envi. Research										0	1	1	2	4	6		
<i>Start-up companies</i>																	
Op Sci & Technology	2	2	1	1	0	0	0	0	1	1	0	0	1	0	1	1	
Tech Transfer	3	5	4	1	5	4	6	5	8	3	8	2	8	9	9	9	
<i>U.S. Patents issued</i>																	
BIO5			7		11	10	10	10	6								
Tech Transfer	9	8	10	12	15	18	18	10	20	13	20	11	23	26	29	32	
<b>CURRICULUM INNOVATIONS /STUDENTS SERVED</b>																	
Anyplace Access			10		19		36	37	38	34	34	34	34	34	34	34	
Nursing Online Programs										17	21	17	18	15	9		
<i>K-12 students benefiting from teacher training</i>																	
BIO5										25,650	5,475	32,283	6,075	6,675	7,375	7,875	
Educator Develop Plan		2,150		2,500		3,200		3,800		3,000	4,250	4,250	8,600	13,300	18,050	22,000	
Water Sustainability		0		26,500		26,340		29,230		33,480	25,000	30,565	26,000	27,000	28,000	29,000	
<b>OUTREACH/Educational outreach presentations</b>																	
McKnight Brain Institute											10	11	10	10	10	10	
Op Sci & Technology		3		2		2		2	1	3	1	17	1	1	2	2	
<b>NEW FACULTY HIRED</b>																	
BIO5	5	7	5	8	5	8	3	6	6	6	4	9	4	4	4	4	
Op Sci & Technology	4	3	4	6	2	0	2	1	2	1	2	3	2	2	2	2	
Water Sustainability		1		0		1		1		N	9	9	2	2	2	2	
<b>OTHER</b>																	
<i>Special fees collected</i>																	
Anyplace Access		\$0		\$0		\$0		\$179,000	\$240K	\$243K	\$240K	\$240K	\$240K	\$240K	\$240K	\$240K	
Nursing Online Programs											\$250K	\$372K	\$250K	\$250K	\$250K	\$250K	

\* selected data taken from August 2007 individual initiative brochures

# FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward & Over-realized	\$ -	\$ 7,585,374	\$ 2,877,555	\$ 4,009,727	\$ 5,800,121	\$ 6,812,073	\$ 6,812,073	\$ 8,026,022	\$ -	\$ -	\$ -
ACIST	\$ 3,864,703	\$ 4,131,026	\$ 4,220,089	\$ 4,383,731	\$ 3,386,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Anyplace Access	\$ 972,919	\$ 959,744	\$ 1,004,778	\$ 1,003,088	\$ 1,162,231	\$ 1,030,394	\$ 1,030,394	\$ 1,199,394	\$ 1,030,394	\$ 1,030,394	\$ 1,030,394
Critical Core Infrastructure	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,230,200	\$ 5,230,200	\$ 5,614,621	\$ 5,711,935	\$ 5,972,852	\$ 6,248,118
Tech Transfer Infrastructure	\$ 484,815	\$ 576,422	\$ 703,348	\$ 803,892	\$ 961,846	\$ 826,810	\$ 826,810	\$ 825,210	\$ 825,210	\$ 825,210	\$ 825,210
Workforce Education	\$ 775,705	\$ 769,523	\$ 808,320	\$ 801,574	\$ 961,846	\$ 863,817	\$ 863,817	\$ 863,817	\$ 813,817	\$ 813,817	\$ 813,817
BIO5	\$ 4,837,623	\$ 4,803,518	\$ 5,251,866	\$ 6,976,943	\$ 5,811,155	\$ 6,294,063	\$ 6,294,063	\$ 5,887,812	\$ 5,087,812	\$ 5,087,812	\$ 5,087,812
Optics & Technology	\$ 4,395,646	\$ 4,803,518	\$ 4,521,523	\$ 4,491,847	\$ 4,047,769	\$ 3,646,492	\$ 3,646,492	\$ 3,755,667	\$ 3,275,667	\$ 3,275,667	\$ 3,275,667
Water Sustainability	\$ 474,283	\$ 480,352	\$ 2,009,566	\$ 2,460,948	\$ 3,907,500	\$ 3,854,645	\$ 3,854,645	\$ 3,571,127	\$ 3,246,106	\$ 3,246,106	\$ 3,246,106
Venture Fund	\$ -	\$ -	\$ -	\$ 68,123	\$ -	\$ 714,079	\$ 714,079	\$ 534,457	\$ 3,728,735	\$ 4,772,400	\$ 5,873,468
ACTREC	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 900,000	\$ 700,000	\$ 600,000	\$ 750,000
CON Online Programs	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 301,000	\$ 240,000	\$ 300,000	\$ 350,000
Expansion Phx Biomed Campus	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,250,000	\$ 1,250,000	\$ 2,073,000	\$ 2,073,000	\$ 1,973,000	\$ 1,973,000
ASU-UA Joint Biomed Res Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000
McKnight Brain Institute	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 350,500	\$ 350,500	\$ 170,000	\$ 800,000	\$ 800,000	\$ 800,000
Planning ABC	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Trans. Environment Research	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 790,822	\$ 790,822	\$ 506,184	\$ 311,883	\$ 506,761	\$ 543,676
<b>TOTAL REVENUE</b>	<b>\$ 15,805,694</b>	<b>\$ 24,109,477</b>	<b>\$ 21,397,045</b>	<b>\$ 24,999,873</b>	<b>\$ 26,038,968</b>	<b>\$ 32,163,895</b>	<b>\$ 32,163,895</b>	<b>\$ 34,728,311</b>	<b>\$ 28,344,559</b>	<b>\$ 29,704,019</b>	<b>\$ 31,317,268</b>
<b>EXPENDITURES</b>											
ACIST	\$ 2,182,290	\$ 4,286,510	\$ 4,859,477	\$ 4,350,084	\$ 3,876,167	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Anyplace Access	\$ 65,251	\$ 1,679,794	\$ 1,088,510	\$ 1,081,762	\$ 1,199,054	\$ 1,027,141	\$ 832,903	\$ 1,393,632	\$ 1,030,394	\$ 1,030,394	\$ 1,030,394
Critical Core Infra.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,249,069	\$ 5,186,186	\$ 5,677,504	\$ 5,711,935	\$ 5,972,852	\$ 6,248,118
Tech Transfer Infrastructure	\$ 367,735	\$ 577,644	\$ 558,834	\$ 762,795	\$ 1,090,377	\$ 999,748	\$ 966,919	\$ 858,039	\$ 825,210	\$ 825,210	\$ 825,210
Workforce Education	\$ 637,248	\$ 646,438	\$ 876,201	\$ 862,376	\$ 861,613	\$ 1,092,420	\$ 948,541	\$ 1,007,696	\$ 813,817	\$ 813,817	\$ 813,817
BIO5	\$ 2,075,899	\$ 7,199,779	\$ 3,852,669	\$ 6,220,377	\$ 7,645,577	\$ 6,980,867	\$ 5,288,883	\$ 7,579,796	\$ 5,087,812	\$ 5,087,812	\$ 5,087,812
Optics & Technology	\$ 2,859,694	\$ 6,014,645	\$ 4,480,050	\$ 3,627,920	\$ 4,142,408	\$ 3,782,078	\$ 3,187,607	\$ 4,350,138	\$ 3,275,667	\$ 3,275,667	\$ 3,275,667
Water Sustainability	\$ 32,203	\$ 827,112	\$ 1,667,088	\$ 2,302,796	\$ 3,813,467	\$ 4,544,628	\$ 3,405,987	\$ 4,709,768	\$ 3,246,106	\$ 3,246,106	\$ 3,246,106
Venture Fund	\$ -	\$ -	\$ -	\$ -	\$ 68,123	\$ 1,201,622	\$ 1,028,843	\$ 707,236	\$ 3,728,735	\$ 4,772,400	\$ 5,873,468
ACTREC	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,000,000	\$ 74,051	\$ 1,825,949	\$ 700,000	\$ 600,000	\$ 750,000
CON Online Programs	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 350,000	\$ 345,462	\$ 305,538	\$ 240,000	\$ 300,000	\$ 350,000
Expansion Phx Biomed	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,145,000	\$ 2,009,192	\$ 2,208,808	\$ 2,073,000	\$ 1,973,000	\$ 1,973,000
ASU-UA Joint Biomed	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,000,000	\$ 187,472	\$ 1,312,528	\$ 500,000	\$ 500,000	\$ 500,000
McKnight Brain Institute	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,250,500	\$ 396,763	\$ 1,023,737	\$ 800,000	\$ 800,000	\$ 800,000
Planning ABC	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 750,000	\$ 211,146	\$ 538,854	\$ -	\$ -	\$ -
Trans. Environment Research	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 790,822	\$ 67,918	\$ 1,229,088	\$ 311,883	\$ 506,761	\$ 543,676
<b>TOTAL EXPENDITURES</b>	<b>\$ 8,220,320</b>	<b>\$ 21,231,922</b>	<b>\$ 17,382,829</b>	<b>\$ 19,208,110</b>	<b>\$ 22,696,786</b>	<b>\$ 32,163,895</b>	<b>\$ 24,137,873</b>	<b>\$ 34,728,311</b>	<b>\$ 28,344,559</b>	<b>\$ 29,704,019</b>	<b>\$ 31,317,268</b>

FY 2007 Carry Forward amounts include FY 2006 TRIF revenue in excess of budget (Over-Realized Revenue) received by ABOR in FY 2006 but not allocated to the universities until November 2006 (FY 2007). Because of necessary planning time required by the universities, not all funds were expended in FY 2006. Some initiatives were funded from "over-realized" TRIF funds, so do not show direct allocations.

FINANCIAL RETURN ON INVESTMENT (ROI)*						
INITIATIVE	FY02 ROI	FY03 ROI	FY 04 ROI	FY05 ROI	FY 06 ROI	FY 07 ROI
ACIST	0.5	1.2	0.7	0.9	0.5	-
BIO5	0.7	2.2	6.6	4.3	3.5	6.7
McKnight	-	-	-	-	-	5.88
Optics	4.0	0.6	4.5	0.7	1.90	6.8
TER	-	-	-	-	-	1.05
Water Sustainability	0.00	2.2	1.5	1.5	0.90	3.1

\* Total grants/contracts, gifts, royalty revenues, license-based cost recovery, divided by total TRIF expenditures.

## MANAGEMENT AND ADVISORY BOARDS

**Management:** All University of Arizona TRIF Initiatives report to Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies, and Economic Development. The Directors of the individual initiatives are listed below:

**ACTREC:** Dr. Leslie Boyer, Medical Director, Arizona Poison and Drug Information Center, and Associate Professor, Clinical Pediatrics

**Anyplace Access for Arizonans:** Dr. David Cox, Associate Vice President for Outreach, College of Agriculture and Life Sciences (<http://trif.arizona.edu/access>)

**ASU/UA Joint Collaboration:** Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies, and Economic Development

**BIO5:** Dr. Vicki Chandler, Regents Professor, BIO5 Institute ([www.bio5.org](http://www.bio5.org))

**Critical Core Infrastructure:** Ms. Michele Norin, Interim CIO and Executive Director, Center for Computing and Information Technology

**Evelyn F. McKnight Brain Institute:** Dr. Carol A. Barnes, Regents Professor and Evelyn F. McKnight Endowed Professor, Psychology

**Nursing Online Programs:** Dr. Marjorie A. Isenberg, Dean and Professor, College of Nursing

**Optical Sciences and Technology Initiative:** Dr. James C. Wyant, Dean and Professor, College of Optical Sciences

**Accelerated Planning for Phoenix Biomedical Campus:** Mr. Joel Valdez, Senior Vice President, Business Affairs

**Expansion of Phoenix Biomedical Campus:** Mr. Joel Valdez, Senior Vice President, Business Affairs

**Technology Transfer Infrastructure:** Bruce Wright, Associate Vice President for Economic Development, and Dr. Patrick Jones, Director of Office of Technology Transfer

**Translational Environmental Research :** Dr. Jonathan Overpeck, Director, Institute for the Study of Planet Earth

**Venture Fund:** Dr. Eugene G. Sander, Executive Vice President and Provost, and Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies, and Economic Development

**Water Sustainability:** Dr. Sharon Megdal, Director, Water Resources Research Center, College of Agriculture and Life Sciences

**Workforce Initiative: Educator Development Plan:** Dr. Ronald W. Marx, Dean, College of Education

**Advisory Boards:** Each University of Arizona TRIF Initiative has its own Advisory Board, composed of experts in the community who can help to steer activities toward maximum societal impact. For additional information, refer to page 4 of the brochures for the individual TRIF initiatives.

## LEARN MORE

Contact Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies, and Economic Development, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513. For more information, visit our website at [www.vpr.arizona.edu/trif](http://www.vpr.arizona.edu/trif).

**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)**

**ANYPLACE ACCESS FOR ARIZONANS**

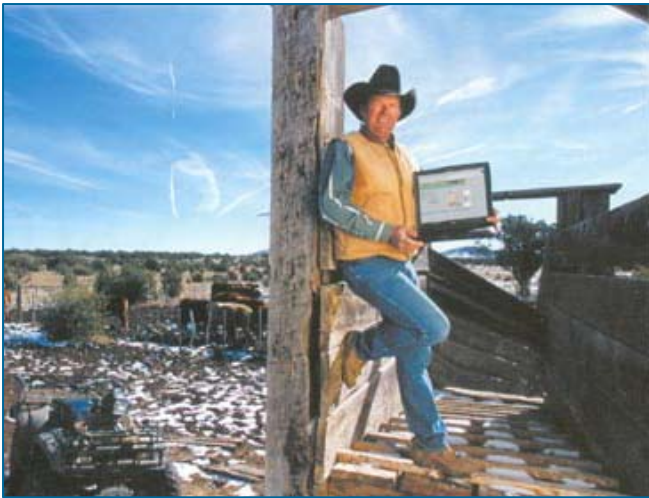
**THE UNIVERSITY OF ARIZONA.**

Arizona's First University.

September 1, 2007



Anyplace Access for Arizonans responds to workforce and workplace needs within the State of Arizona, exploiting new information and communication technologies to extend valuable education and outreach activities to a broad and diverse constituency. With long traditions of statewide Cooperative Extension and advanced distance education, The University of Arizona has unique opportunities to serve the state through electronically delivered content that can increase people's lifelong earnings, improve their productivity on the job, and solve practical problems in their daily lives.



The "RangeView" website, one of many resources providing what Arizonans need when and where they need it.

Our vision is to extend access to *the best* that public higher education can offer to all Arizonans, regardless of place. Both formal and non-formal education are within the scope of this initiative, which aims to benefit all Arizonans, including not only those who seek higher education for themselves, but also those who seek knowledge and information for use in ordinary work and life settings.

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Dr. David E. Cox  
Associate Dean and Director

# PERFORMANCE ANALYSIS

Metrics	FY 02 proj	FY 02 actual	FY 03 proj	FY 03 actual	FY 04 proj	FY 04 actual	FY 05 proj	FY 05 actual	FY 06 proj	FY 06 actual	FY 07 proj	FY 07 actual	FY 08 proj	FY 09 proj	FY 10 proj	FY 11 proj
<b>RETURN ON INVESTMENT</b>																
Federal funds awarded		\$0		\$302K		\$339K		\$945K	\$1M	\$848K	\$1.1M	\$3.4M	\$1.2M	\$1.3M	\$1.4M	\$1.5M
State funds awarded		\$3K		\$15K		\$33K		\$0	0	\$0	\$0	\$45K	\$0	\$0	\$0	\$0
Corporate funds awarded		\$0		\$10K		\$0		\$0	0	\$0	\$10K	0	\$20K	\$30K	\$40K	\$50K
<b>ACCESS/WORKFORCE CONTRIBUTIONS</b>																
Number graduate students enrolled within initiative		0		0	20	19	40	37	73	161	147	39	177	200	210	220
Number graduate degrees awarded		0		0		0		0	0	0	19	0	18	25	30	35
Number certificates granted		0		0		0		0	0	9	50	0	50	100	100	100
Number continuing education professional students		0		0		0		0	70	224	120	8	200	200	200	200
<b>CURRICULUM INNOVATIONS</b>																
Number of newly revised courses offered		0		0		0		8	4	10	4	38	4	4	4	4
Number new certificates offered		0		0		0		2	1	1	1	2	0	1	0	1
Number new online courses offered		0		10		19		28	33	28	30	5	30	30	30	30
Number new online degree programs offered		0		0	2	2	2	1	1	1	0	1	1	0	1	0
<b>OTHER PERFORMANCE METRICS FOR THIS INITIATIVE</b>																
Special program fees collected		\$0		\$0		\$0		\$179K	\$240k	\$243K	\$240K	\$36K	\$240K	\$240K	\$240K	\$240K
Number undergraduates employed in TRIF projects		14		19		17		13	12	5	12	5	12	12	12	12
Electronic extension & workplace resources created		0		1		2		1	1	1	1	586	1	1	1	1
Number of users of extension and workplace resources		0		493		58,000		103,000	154,000	156,055	200,000	31,415	250,000	300,000	350,000	400,000
Number enrollments in revised courses		0		0		0		5,300	11,000	13,684	15,000	3,253	19,000	21,000	23,000	24,000
New instructional tools acquired or created		0		2		2		2	2	2	2	22	2	2	2	2
<b>OTHER UNIVERSITY-WIDE IMPACTS OF INITIATIVE</b>																
Total supported web & hybrid courses		693		1856		2083		2127	2200	3177	2300	2216	2400	2500	2500	2500
Number enrollments in web & hybrid courses				20,450		24,528		35,353	37,400	77,557	39,100	104,463	40,800	42,500	42,500	42,500

Note: Projections through FY 2005–2006 based on Business Plan approved January 2003; new metrics have been added reflecting new goals and expectations.

## PERFORMANCE ANALYSIS

During fiscal years 2002 through 2007, Anyplace Access to Arizonans contributed all of the following to the local and statewide infrastructure for workforce and workplace support.

- ◆ Recruited 12 technical experts with varied specialties needed for producing high quality distance education and high value information resources
- ◆ Assisted grant-funded projects bringing more than \$3.4M to the University and the State, including projects to preserve endangered Native American languages, projects to improve science instruction, projects to develop health education programs, and others



Online Nursing graduate programs

- ◆ Introduced important new tools for online learning that now support over 100,000 enrollments in more than 2000 individual courses
- ◆ Continued an online PHD in Nursing, the first such program in the US, plus other nursing programs

- ◆ Created a rich online collection of active learning objects to support science teachers at middle-school and high-school levels



Active Learning Objects for K12 Teachers and Students

- ◆ Developed digital library resources and introduced innovative new library services such as online reference
- ◆ Created professionals, and other clientele and offers over 500 educational resources and programs for more than 100,000 users.

## FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward	\$ -	\$ 907,668	\$ 187,618	\$ 103,886	\$ 33,570	\$ (3,253)	\$ (3,253)	\$ 194,238	\$ -	\$ -	\$ -
New TRIF Revenue	\$ 972,919	\$ 959,744	\$ 1,004,778	\$ 1,003,088	\$ 1,162,231	\$ 1,030,394	\$ 1,030,394	\$ 1,199,394	\$ 1,030,394	\$ 1,030,394	\$ 1,030,394
<b>Total Revenue</b>	<b>\$ 972,919</b>	<b>\$ 1,867,412</b>	<b>\$ 1,192,396</b>	<b>\$ 1,106,974</b>	<b>\$ 1,195,801</b>	<b>\$ 1,027,141</b>	<b>\$ 1,027,141</b>	<b>\$ 1,393,632</b>	<b>\$ 1,030,394</b>	<b>\$ 1,030,394</b>	<b>\$ 1,030,394</b>
<b>EXPENDITURES</b>											
Personal Services	\$ 8,251	\$ 703,016	\$ 785,471	\$ 952,071	\$ 793,758	\$ 957,141	\$ 755,409	\$ 1,253,632	\$ 960,394	\$ 960,394	\$ 960,394
All Other Operating Expenses	\$ 57,000	\$ 976,778	\$ 303,039	\$ 129,691	\$ 261,696	\$ 70,000	\$ 77,494	\$ 140,000	\$ 70,000	\$ 70,000	\$ 70,000
Capital	\$ -	\$ -	\$ -	\$ -	\$ 143,600	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Expenditures</b>	<b>\$ 65,251</b>	<b>\$ 1,679,794</b>	<b>\$ 1,088,510</b>	<b>\$ 1,081,762</b>	<b>\$ 1,199,054</b>	<b>\$ 1,027,141</b>	<b>\$ 832,903</b>	<b>\$ 1,393,632</b>	<b>\$ 1,030,394</b>	<b>\$ 1,030,394</b>	<b>\$ 1,030,394</b>

To match HB 2661 General Adjustments given to state-funded employees, \$30,394 from the Venture Fund was allocated to this initiative for its personnel.

This initiative received \$169,000 in FY 08 from the Venture Fund in support of new projects.

As a non-research initiative and pursuant to the new March 2007 Return on Investment (ROI) policy, ROI will not be calculated in FY 2007-2011.

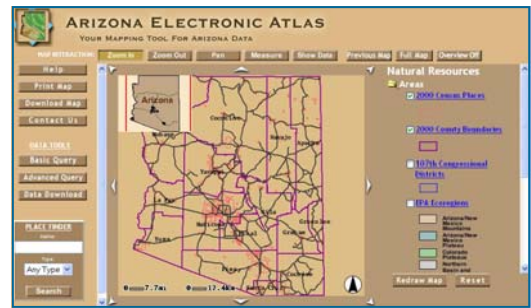
Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

**Goal 1:** Making advanced degrees and certificates available at a distance from the campus, in such fields as

Nursing, Public Health, Optical Sciences, Engineering, Biological Sciences and Biotechnology, Information Resources in Library Science, Business, Law, and Education.

**Goal 2:** Creating specialty information resources that can increase on-the-job productivity, in resources such as Electronic Agricultural Extension, Arizona Electronic Atlas, active learning objects for K12 teachers, online library reference and digital collections, and Ask-an-Expert web sites.

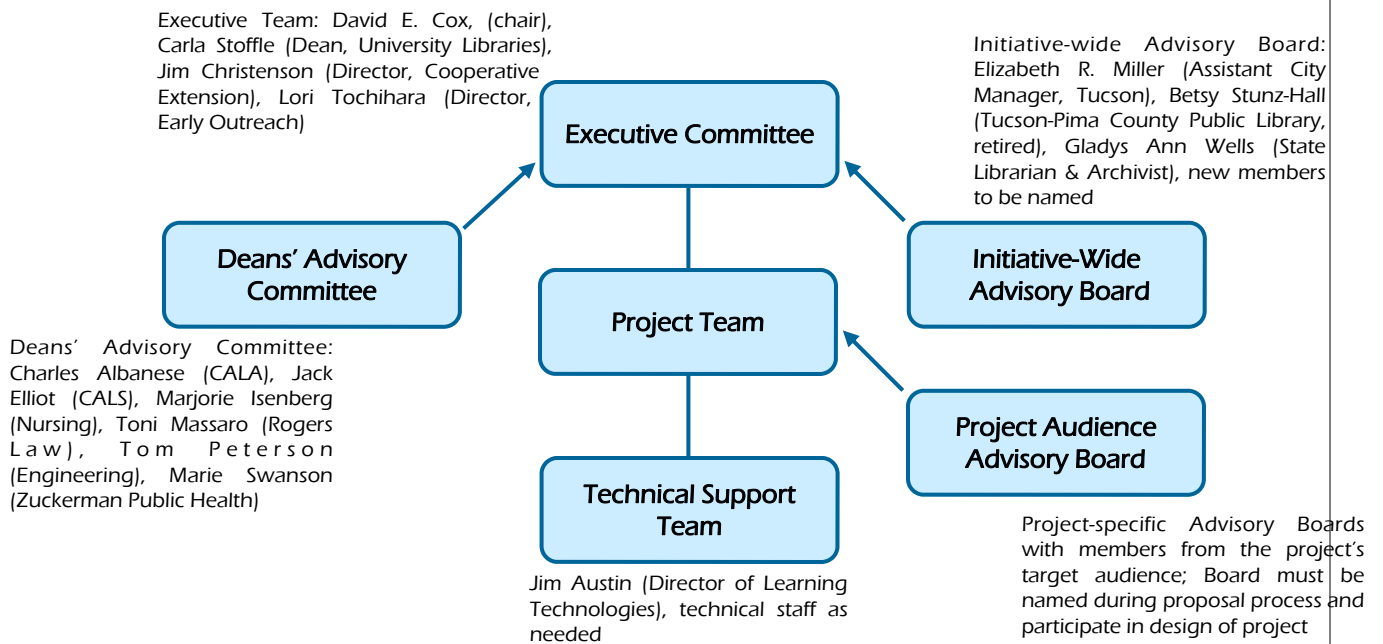


Screenshot for interactive Arizona Electronic Atlas, a rich repository of information about the state.

## MANAGEMENT

All UA TRIF initiatives report to Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development. Direct oversight of this initiative is assigned to Dr. David E. Cox, Associate Vice President, Outreach and Associate Dean, Agriculture and Life Sciences. Project Teams are composed of faculty and other academic personnel, and Technical Support Teams are formed from expert technical staff within the Learning Technologies Center and other academic support units.

## ADVISORY BOARDS



## LEARN MORE

Contact Dr. David E. Cox, Associate Dean at [dcox@ag.arizona.edu](mailto:dcox@ag.arizona.edu) or 520-621-3612.

Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513.



TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)

# ARIZONA CLINICAL AND TRANSLATIONAL RESEARCH AND EDUCATION CONSORTIUM

THE UNIVERSITY OF ARIZONA.

Arizona's First University.

September 1, 2007

## ACTREC

Considerable advances have been made during the last decades in our understanding of the biological basis of health and disease. Developments in biotechnology have provided researchers with new, high throughput tools that have expanded our understanding of the way normal cells, tissues, and organisms work



and of the disruptions in these vital processes that occur during disease. Justifiably, the general public has had the hope that these breakthroughs could rapidly produce cures for cancer, diabetes, heart and lung diseases, and other ailments.

In order for these hopes to become reality, a new generation of clinical and translational scientists is emerging, who are bridging the gap between basic and clinical sciences and who will transform cutting edge knowledge into medicines to treat patients and preserve health. These scientists will lead the way towards the medicine of the future, one that finds the right treatment for the right patient, so as to maximize therapeutic effect and minimize unwanted side-effects.

The Arizona Clinical and Translational Research and Education Consortium (ACTREC) will create the resources and the core facilities to allow the state of Arizona to be a leader in training this new generation of scientists. We will collaborate with academic and private partners to develop for Arizona the new industry that is emerging around clinical and translational sciences in the United States.

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*Dr. Keith Joiner  
Vice Provost for Medical Affairs  
Dean, UA College of Medicine*

**PERFORMANCE ANALYSIS**

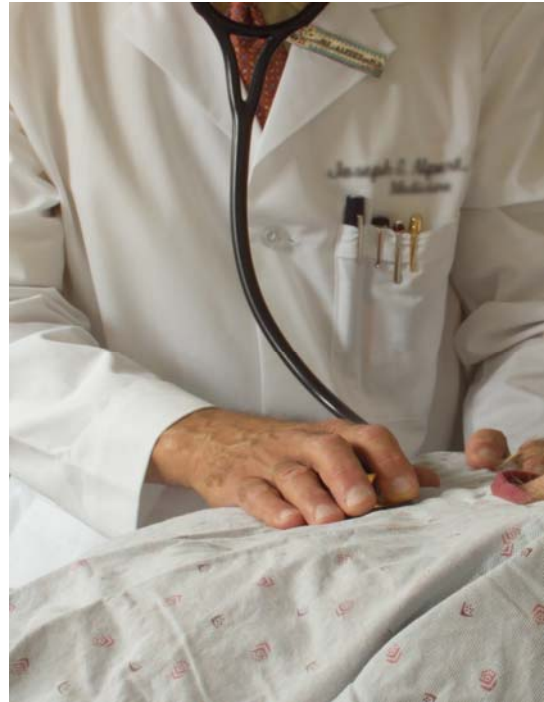
Performance Measures	FY07 Projected	FY07 Actual	FY08 Projected	FY09 Projected	FY10 Projected	FY11 Projected
<b>RETURN ON INVESTMENT</b>						
CTSA Federal Grant (U54)		-	-		\$6M*	\$6M
Clinical Trials Contracts	\$0.5M	NA	\$1M	\$2M	\$3M	\$6M
Other Grants Received		-	-	\$1M	\$3M	\$5M
Clinical Scholars Circle members	9	13	15	27	50	75
New faculty hired	1	1	1	4	4	4
<b>TECHNOLOGY TRANSFER AND INDUSTRY COLLABORATION</b>						
New companies formed	0	0	0	1	0	1
Research agreements with outside partners	0	0	1	3	5	6
Workshops & seminars	0	0	0	2	4	8
<b>WORKFORCE CONTRIBUTIONS</b>						
Graduate and professional students trained	0	0	0	0	10	20
Interns and residents trained	0	0	0	0	0	12
<b>EDUCATION</b>						
Translational Scholars	3	6 in process	3	3	6	12
Training grants obtained or renewed	0	0	0	1	3	6
Continuing Education Programs	4	NA	4	10	15	20
<b>PARTNERSHIPS/ COLLABORATIONS</b>						
Affiliate clinical partners in ACTREC	5	In process	10	15	25	35
Clinicians in ACTREC	40	44	50	80	120	150
Affiliate research institutions in ACTREC	4	3	4	6	9	12

\* assuming funding is approved

## PERFORMANCE ANALYSIS

The ACTREC program will foster the creation of a statewide structure for clinical and translational research, the creation of structures for statewide dissemination and assessment of this research, application of biomedical informatics and enabling technologies, creation of small businesses that will support clinical research in the State, and development of new structures for training and financial support of teams of clinical and translational investigators.

Ultimate success of this aggregate process will be reflected in the achievement of a Clinical and Translational Science Award (CTSA). NIH funding through the CTSA mechanism, regardless of the added benefits of increased research productivity, will bring \$5 to 6 million in new federal funds to Arizona. As a consequence of improved infrastructure we will realize benefits in technology transfer, industry collaboration, workforce development, translational science education, and research partnerships across the state.



## FINANCIAL INFORMATION

	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>						
Carry Forward	\$1,000,000	\$1,000,000	\$925,949	-	-	-
New TRIF Revenue	-	-	\$900,000	\$700,000	\$600,000	\$750,000
<b>TOTAL REVENUE</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,825,949</b>	<b>\$700,000</b>	<b>\$600,000</b>	<b>\$750,000</b>
<b>EXPENDITURES</b>						
Personal Services	\$778,800	\$53,920	\$1,704,749	\$578,500	\$500,500	\$650,000
All Other Operating Expenses	\$121,200	\$20,131	\$121,200	\$121,500	\$99,500	\$100,000
Capital	\$100,000	-	-	-	-	-
<b>TOTAL EXPENDITURES</b>	<b>\$1,000,000</b>	<b>\$74,051</b>	<b>\$1,825,949</b>	<b>\$700,000</b>	<b>\$600,000</b>	<b>\$750,000</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

The main goals of the UA ACTREC office are to:

- Actively support the development of the statewide consortium by consolidating and facilitating the UA's clinical and translational research mission. For this purpose, we will establish the infrastructure facilitating

institutional and collaborative conduct of clinical and translational research, including core support for study design, data management and bioinformatics, contracts, IRB interface, patient management, long distance clinical collaboration, good clinical

*(Continued on page 4)*

## GOALS

*(Continued from page 3)*

- practice, and good laboratory practice.
- Establish a translational scholars program and a clinical scholar's circle, which will bring together cross-disciplinary senior faculty mentors and clinician scholars by offering incentives for research collaborations through a mentored faculty development and research education program.
- Enable the development of a statewide clinical science and clinical trial industry by facilitating the development of small businesses that will provide core services and management support to industrial and academic partners interested in performing clinical studies in Arizona.

## MANAGEMENT

UA ACTREC is directed by an Executive Working Group, chaired by Dr. Fernando Martinez. The Executive Working Group reports to an Advisory Board with broad institutional representation, chaired by Dr. Keith Joiner, Vice Provost for Medical Affairs and Dean, College of Medicine.

## ADVISORY BOARDS

### UA ACTREC Executive Working Group:

Fernando Martinez, *Director, Arizona Respiratory Center* (Chair)

David Alberts, *Director, Arizona Cancer Center*

J. Lyle Bootman, *Dean, College of Pharmacy*

Vicki Chandler, *Director, BIO5 Institute*

Robert Gillies, *Director, Advanced Research Institute of Biomedical Imaging (ARIBI)*

Keith A. Joiner, *Dean, College of Medicine*

John Murphy, *Associate Dean, College of Pharmacy*

Ronald Weinstein, *Department Head, Pathology, and Director, Arizona Telemedicine Program*

### UA ACTREC Advisory Board:

Keith Joiner, *Vice Provost for Medical Affairs and Dean, College of Medicine*, (Chair)

J. Lyle Bootman, *Dean, College of Pharmacy*

Vicki Chandler, *Director, BIO5 Institute*

George Davis, *Executive Vice President and Provost*

Marjorie Isenberg, *Dean, College of Nursing*

Tom Peterson, *Dean, College of Engineering*

Joaquin Ruiz, *Dean, College of Science*

Eugene Sander, *Vice President for University Outreach and Dean, College of Agriculture and Life Sciences*

G. Marie Swanson, *Dean, College of Public Health*

Leslie Tolbert, *Vice President for Research*

James Wyant, *Dean, College of Optical Sciences*

## LEARN MORE

- ◆ Contact Dr. Leslie Boyer, Project Director for UA ACTREC, at [boyer@pharmacy.arizona.edu](mailto:boyer@pharmacy.arizona.edu) or 520-626-6229
- ◆ Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, The University of Arizona, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu)



TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)

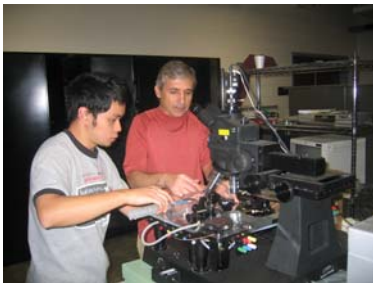
# BIO5

THE UNIVERSITY OF ARIZONA.

Arizona's First University.

September 1, 2007

## BIO5<sup>TM</sup> Institute



BIO5 faculty member Yitshak Zohar (right) collaborates on the development of a device that selectively extracts metastatic tumor cells from the blood of a cancer patient.



BIO5 houses the Arizona Proteomics Consortium, which offers the largest and most mature proteomics service in the state. Services are available to academic and private sector investigators.



120+ teachers from throughout Arizona attended the 2007 BIO5 Arizona Science Teacher Symposium. Teachers attended workshops, a resources fair, luncheon with a keynote speaker and received recertification units.

By bringing together some of the world's top scientists in agriculture, medicine, pharmacy, basic science, and engineering, BIO5 encourages significant scientific achievement that improves lives and stimulates economic development.

BIO5's new home, the Thomas W. Keating (TWK) Bioresearch Building sets a new standard in design and research interaction, fostering interdisciplinary, translational research among diverse fields in a single facility. The confluence of research and training programs normally housed separately sparks ideas and solutions that might not otherwise develop. That research – combined with BIO5's industry and K-12 education partnerships – accelerates the process of discovery and the growth of Arizona's biotechnology industry.

Researchers associated with BIO5 tackle complex and pressing problems: how to diagnose, treat and prevent disease; how to better feed the world; and how to maintain livable environments. Through its programs in bioengineering, drug discovery, genome structure and function, and quantitative biology, BIO5's scientists address cancer, diabetes, heart, neurological and respiratory diseases; develop new diagnostic tools; improve yield and nutritional quality of crops; and develop plants as sources of pharmaceuticals.

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Dr. Vicki Chandler  
BIO5 Director

# PERFORMANCE ANALYSIS

BIO5 METRICS (\$ in Millions)	FY 02 Proj	FY 02 Actual	FY 03 Proj	FY 03 Actual	FY 04 Proj	FY 04 Actual	FY 05 Proj	FY 05 Actual	FY 06 Proj	FY 06 Actual	FY 07 Proj	FY 07 Actual	FY 08 Proj	FY 09 Proj	FY 10 Proj	FY 11 Proj
<b>RETURN ON INVESTMENT</b>																
Federal Grants Received [1]	\$2.0	\$1.4	\$4.0	\$12.6	\$6.0	\$22.5	\$8.0	[3] \$25.5	\$25.0	\$26.50	[8] \$28.0	\$34.10	\$28.0	\$28.0	\$28.0	\$28.0
Research Grant Proposals Pending [2]		\$19.1		\$21.5		\$43.3		\$60.4	\$55.0	\$88.70						
New Faculty Hired	5	7	5	8	5	8	3	6	6	6	4	9	4	4	4	4
Research Infrastructure Support		\$0.0		\$3.0		\$2.6		\$0.7	\$0.0	\$0.0						
SBIR/STTR Grants		0		0		2	2	1	2	2						
Corporate Contracts											[8] \$0.5	\$1.00	\$0.5	\$0.5	\$0.5	\$0.5
Gifts										\$0.2	\$0.1	\$0.27	\$0.2	\$0.3	\$0.4	\$0.5
<b>ECONOMIC DEVELOPMENT</b>																
Corporate Sponsored Contracts		\$0.0		\$0.1		\$0.2		[3] \$0.3	\$1.0	\$0.40						
Industrial Interactions		2		64		96	90	129	125	127						
Industrial Collaborations		2		6		12	12	40	20	42						
<b>TECHNOLOGY TRANSFER &amp; INDUSTRY COLLABORATIONS (4)</b>																
Invention Disclosures		0		57		46	50	65	50	30	22	30	24	26	28	28
Licenses or Options		0		75		17	20	25	20	7	4	4	5	6	7	8
U.S. Patent Applications		1		37		63	60	50	60	37						
U.S. Patents Issued		0		7		11	10	10	10	4						
% of BIO5 Faculty working with Office of Technology Transfer											25	18	33	20	22	24
New Companies Formed											1	1	1	0	1	0
Seminars on Tech Transfer or Entrepreneurship	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3
New Interactions with External Parties											33	22	43	24	26	28
New Collaborations Executed with External Parties											4	5	9	6	7	8
<b>WORKFORCE CONTRIBUTIONS</b>																
Training Grants Obtained or Renewed				3		2	2	1	2	1	1	3	1	2	2	3
Undergraduate Degrees Awarded		0		658		705	700	733	735	1,014						
Undergraduates with Research Experience [5]		0		229		234	235	243	245	278						
Graduate Degrees Awarded		0		266		280	270	285	285	420						
Graduate Students Enrolled		0		1,183		1,299	1,300	1,341	1,750	1,268						
Undergraduates Training in BIO5 Research Labs											231	214	298	218	222	226
Non-UA Undergraduate Internships in BIO5 Labs											42	24	33	25	26	27
Graduate Students and Postdoctoral Fellows Training in BIO5 Labs											427	400	437	414	429	444
Graduate Students participating in research in Bioindustry Facilities											43	40	43	41	42	43
High school students trained in BIO5 labs or with BIO5 internships											NA	NA	38	40	42	44
<b>SPECIFIC CURRICULUM INNOVATIONS</b>																
K-12 Teachers Involved in Research											31	15	17	15	15	18
K-12 Teachers Involved in Teacher Training											177	90	260	160	170	200
K-12 Teachers Involved in Outreach Programs & Science Exhibits											12	8	12	10	12	15
K-12 Students Benefiting from Teacher Training											25,650	5,475	32,283	6,075	6,675	7,375
K-12 Students Participating Directly in Activities											9,432	3,700	13,021	3,700	3,800	4,000
New Activities Developed for K-12 Outreach											6	4	8	4	5	6
Outreach Grants Obtained or Renewed											1	1	2	1	1	2
<b>PROMOTING LIFE SCIENCE POTENTIAL</b>																
Media Coverage [6]		0		79/12		70/44	70/15	64/15	70/15	97/20						
Web Enhancements		0		2		1	1	4	2	8						
Presentations/Exhibits		0		19		26	25	25	25	52						
Political Outreach [7]		0		21		7	10	21	20	27						
<b>OTHER KNOWLEDGE TRANSFER</b>																
Workshops and Conferences Supported											7	3	7	3	3	3

[1] Dollars obtained in indicated fiscal year from federal, state and private competitive grants by all BIO5 faculty. Amount in parenthesis indicates dollars for faculty receiving TRIF support.

[2] Dollars awarded or under review from competitive research proposals for all BIO5 faculty. Amount in parenthesis indicates dollars for faculty receiving TRIF support.

[3] Corporate Sponsored contracts for FY05 included foundation and state grant activity. FY05 amounts have been corrected.

[4] Data represents activity of all UA life science departments for FY02 - FY06. Data in parenthesis and projected in FY07 - FY11 represents BIO5 faculty only.

[5] Number of undergrads participating in formal research experience programs (UBRP, MARC, etc.)

[6] Newspaper, radio, TV, web stories / background briefings and presentations

[7] Includes formal events and individual briefings, presentations

[8] FY07-FY11 projections updated based on new Return on Investment (ROI) criteria. Previous numbers were based on the assumption there was no time limit on leveraging faculty hires. With the 5-year time limit, the number of faculty represented in these numbers will not be increasing and therefore the projected return will be flat. In reality, the original projections (\$35M, \$45M, \$55M, \$65M, \$75M) would be a more accurate reflection of the leveraging.

## PERFORMANCE ANALYSIS

BIO5 continues to significantly leverage TRIF funds to improve Arizonans' lives by conducting cutting edge research, driving discoveries to market, and preparing students for careers in science and technology. When the Business Plan for FY07-11 was approved BIO5's BAB suggested modifications of the metrics. Thus, for FY07 onward some categories reported during the first 5 years are no longer reported, others are moved into different categories, and additional metrics have been added. BIO5 met or exceeded its projections for FY07.

**Return on Investment (ROI):** We projected and report dollars for only those BIO5 faculty who are or have been directly supported by TRIF. Our faculty continue to be nationally competitive in garnering federal research dollars, which accounts for >90% of our research dollars and represent new monies to the state. This is in spite of very tight federal budgets. Because BIO5 activities impact all of our faculty's abilities to garner research support, the indirect ROI is much larger.

**Technology Transfer and Industry Collaboration:** BIO5 facilitates the commercialization of new products and processes, as well as the development of the biotechnology industry by promoting interactions among faculty, students, and industrial scientists and making our cutting-edge facilities available to industry scientists. Nine research

collaborations were conducted with industry partners. This year one startup company was formed to develop a new drug to cure valley fever. BIO5 researchers continue to generate substantial invention disclosures and patent activity in the life sciences arena.

**Workforce Contributions:** A critical component of economic development is a workforce to meet the needs of Arizona's growing bioscience industry. Our workforce initiatives from high school through post-graduate are developed in response to industry needs and provide students with exciting experiences that enhance their learning and career opportunities. BIO5 sponsors internships that expose students to industry settings and community college, high school students and teachers to cutting-edge research. BIO5 seeds new training programs (several of which are now federally funded) and develops new courses. We are attracting more top bioscience students to the UA and expanding interactions among UA scientists and other researchers in academia and industry.

**K-12 Science and Math Education:** To enhance K-12 science and math curricula, BIO5 is providing teachers and students in schools all over Arizona access to UA science and math resources. We have continued our successful programs and launched eight new programs, which impacted >200 teachers and >40,000 students throughout the state this year.

## FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$2,761,724	\$365,463	\$1,764,660	\$2,521,226	\$686,804	\$686,804	\$1,691,984	\$0	\$0	\$0
New TRIF Revenue	\$4,837,623	\$4,803,518	\$5,251,866	\$6,976,943	\$5,811,155	\$6,294,063	\$6,294,063	\$5,887,812	\$5,087,812	\$5,087,812	\$5,087,812
<b>TOTAL REVENUE</b>	<b>\$4,837,623</b>	<b>\$7,565,242</b>	<b>\$5,617,329</b>	<b>\$8,741,603</b>	<b>\$8,332,381</b>	<b>\$6,980,867</b>	<b>\$6,980,867</b>	<b>\$7,579,796</b>	<b>\$5,087,812</b>	<b>\$5,087,812</b>	<b>\$5,087,812</b>
<b>EXPENDITURES</b>											
Personal Services	\$620,100	\$3,325,935	\$308,333	\$2,594,735	\$3,604,324	\$5,531,600	\$3,203,532	\$6,255,796	\$4,113,812	\$4,113,812	\$4,113,812
All Other Operating Expenses	\$1,195,799	\$3,713,844	\$1,544,336	\$1,475,642	\$2,353,434	\$1,280,260	\$1,916,344	\$974,000	\$974,000	\$974,000	\$974,000
Capital	\$260,000	\$160,000	\$2,000,000	\$2,150,000	\$1,687,819	\$169,007	\$169,007	\$350,000	\$0	\$0	\$0
<b>TOTAL EXPENDITURES</b>	<b>\$2,075,899</b>	<b>\$7,199,779</b>	<b>\$3,852,669</b>	<b>\$6,220,377</b>	<b>\$7,645,577</b>	<b>\$6,980,867</b>	<b>\$5,288,883</b>	<b>\$7,579,796</b>	<b>\$5,087,812</b>	<b>\$5,087,812</b>	<b>\$5,087,812</b>
<b>Return on Investment</b>	0.7:1	2.2:1	6.6:1	4.3:1	3.5:1	5.1:1	6.7:1	3.8:1	5.7:1	5.7:1	5.7:1

- To match HB 2661 General Adjustments given to state-funded employees, \$87,812 from the Venture Fund was allocated to this initiative for its personnel.  
 - This initiative received \$1,186,150 in FY 07 and \$800,000 in FY 08 from the Venture Fund in support of new projects.  
 - Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.  
 - Return on Investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by the Arizona Board of Regents in March 2007, which is different from the ROI methodology used to calculate ROI in FY 2002-2006.  
 - The Carry Forward of \$1,691,984 represents funds fully-committed to faculty hires, new building costs, and new core facilities, which were slightly delayed but are now proceeding at full speed. All of these funds will be spent by December 2007.

## GOALS

Launched with funds from a voter-approved tax in 2001, BIO5 fuels economic development and helps grow Arizona's knowledge-based economy by:

- ◆ Conducting state-of-the-art biological research that can be translated into tangible human benefit;
- ◆ Developing educational programs for undergraduate and graduate students, as well as for K-12 teachers and

students. Programs aim to develop a bioindustry workforce and enhance science literacy; and

- ◆ Facilitating interactions between researchers and industry to foster the development of biotechnology companies in Arizona.

(Continued on page 4)

## GOALS

(Continued from page 3)

BIO5 research initiatives, identified by external reviewers as strengths at UA, have high potential for federal funding, provide crucial technology platforms and address problems of critical importance to Arizona and the nation.

BIO5 partners include the Arizona Cancer Center, Arizona Respiratory Center, Arizona Research Laboratories, nine UA colleges (medicine, pharmacy, agriculture and life sciences, engineering, public health, optical sciences, education, science, and business), Translational Genomics Research Institute (TGen), Critical Path Institute (C-Path), and Arizona State University's Biodesign Institute .

## MANAGEMENT

BIO5 Director, Dr. Vicki Chandler, reports to Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development. Reporting to Dr. Chandler are: Associate Director, Director for Business Development, Director of Marketing and Communications, Director for Workforce



The Thomas W. Keating Bioresearch Building (left) and adjacent Medical Research Building, set a new standard in high-tech design. Dedication of the two buildings took place on December 1, 2006.

Development, Operations Manager, and the five scientists who coordinate the five research initiatives.

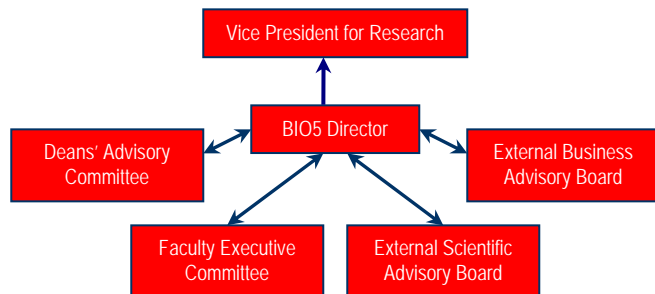
Dr. Chandler and Dr. Tolbert are Regents' Professors of The University of Arizona, and Dr. Chandler is a member of The National Academy of Sciences.

## ADVISORY BOARDS

Two internal advisory committees provide guidance to BIO5:

**Executive Committee:** Dr. Michael Cusanovich, Professor, Biochemistry and Director, Arizona Research Laboratories; Dr. Fernando Martinez, Professor, Pediatrics and Director, Arizona Respiratory Center; Dr. John McGrath, Professor, Aerospace & Mechanical Engineering; and Dr. Roy Parker, Professor, Molecular & Cellular Biology.

**Dean's Advisory Committee:** Dr. Lyle Bootman, Pharmacy; Dr. Keith Joiner, Medicine; Dr. Tom Peterson, Engineering; Dr. Joaquin Ruiz, Science; and Dr. Eugene Sander, Agriculture and Life Sciences.



Two external boards provide oversight:

**Business Advisory Board:** Chair Robert Morrison, Executive Director, Desert Angels; Vice-Chair Kathleen Perkins, CEO, Breault Research; Robert Ashley, Founder, Ashley BioPharm LLC; Robert Barkley, CEO, Barkley Ag Enterprises; David Cohen, Managing Director, Technology Network International; Jack E. Davis, CEO, APS; Robert Davis, First Vice-President, CB Richard Ellis Tucson; Jack Dean, President of U.S. Science and Medical Affairs, Sanofi-Aventis Pharmaceuticals; Burt Ensley, CEO, Matrix Design; Bernd Fischer, Minister of Economics, Embassy Federal Republic of Germany; Stephen Goff, Senior Fellow, Syngenta Biotechnology; Lisa Haile, Partner, DLA Piper Rudnick Gray Cary US LLP; Joseph Jasinski, Program Director, IBM Health Care & Life Sciences; Thomas W. Keating, Loma Catalina Company; Michael Murphy, Legal Counsel, Beaudry Motors; and James Randolph, Retired, Pacific Gas & Electric.

**Scientific Advisory Board:** This board consists of five nationally and internationally renowned scientists, each with expertise in one of BIO5's target research initiatives. Members are: Chair Stephen Goff, Kenneth Wertman, Joseph Ecker and Jack Dean.

## LEARN MORE

- ◆ Contact Dr. Vicki Chandler, BIO5 Director, The University of Arizona, at [chandler@ag.arizona.edu](mailto:chandler@ag.arizona.edu) or 520-626-4272. Visit the BIO5 website at [www.bio5.org](http://www.bio5.org)
- ◆ Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, The University of Arizona, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513



**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**

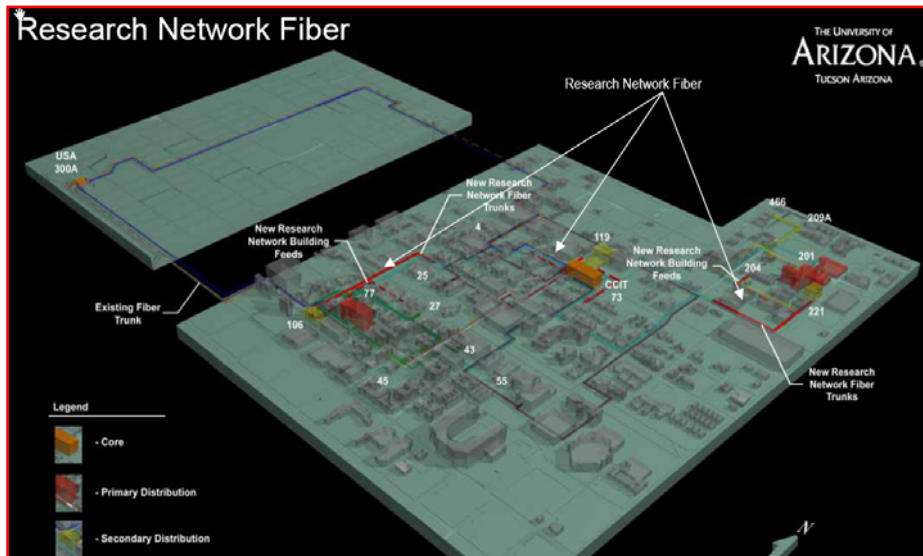
**CRITICAL CORE INFRASTRUCTURE**

**THE UNIVERSITY OF ARIZONA.**

Arizona's First University.

September 1, 2007

**CRITICAL CORE INFRASTRUCTURE**

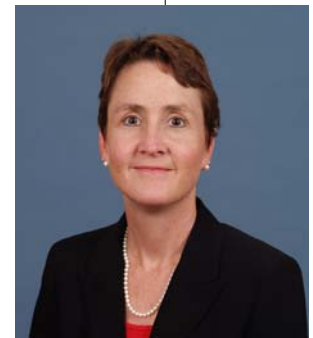


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Building University research and education programs in selected high technology fields is a strategic investment for the state and the region. The University of Arizona is concentrating its research investments from the Technology and Research Initiative Fund in Biotechnology, Optics, and Water Sustainability. These and virtually all other high technology research fields depend on laboratory facilities and on advanced computing resources and high bandwidth connectivity.

While TRIF investments in infrastructure were made throughout the first five years, these investments were made one initiative at a time. Because infrastructure expenditures are better handled centrally, these have now been gathered into a separate initiative. Investments in research buildings, assuring appropriate laboratory space, occur as debt service. Investments in computing and communications infrastructure occur within the central computing organization, CCIT. The goal is to enable research, and by enabling research, to contribute to regional economic development.



*Michele Norin  
Interim CIO & Executive Director*

## PERFORMANCE ANALYSIS

	FY07 Projected	FY 2007 Actual	FY 2008 Projected	FY 2009 Projected	FY 2010 Projected	FY 2011 Projected
Building networks brought to standard	1	1	1	1	1	1
Supercomputer usage	85-90%	90%	85-90%	85-90%	85-90%	85-90%
Supercomputer users (PIs)	50	49	50	50	50	50
Grant expenditures by supercomputer	\$18M	\$27M	\$18M	\$18M	\$18M	\$18M
AZLIVE users (PIs)	12	25	13	14	15	16
Grant expenditures by AZLIVE users	\$1.2M	\$8.2M	\$1.3M	\$1.4M	\$1.5M	\$1.6M
Percentile-ranked access to advanced networks	75th or better	75 <sup>th</sup>	75 <sup>th</sup> or better	75 <sup>th</sup> or better	75 <sup>th</sup> or better	75 <sup>th</sup> or better

**Notes on metrics:**

- ◆ Network standards defined in the Network Master Plan and tri-University network architecture require 1 Gb to the building, inside wiring at Cat 5e or better, and redundant connections. TRIF funding is sufficient for 1 building per year.
- ◆ Supercomputer usage is as a percent of available computing capacity measured in “CPU Days.” High usage levels indicate good use of the resources, but usage close to 100% indicates insufficient capacity.
- ◆ Number of supercomputer users and grant expenditures by supercomputer users are measures of the importance of the supercomputer to the overall research mission. Use is measured in terms of project leads (PIs) rather than individual accounts.
- ◆ Number of AZLIVE users and total grants supported are measures of the importance of AZLIVE to the overall research mission.
- ◆ Percentile-ranked access to advanced networks compares UA to other doctoral institutions. The Educause 2006 Core Data Survey of doctoral institutions received 179 responses with UA at exactly the third quartile (75th percentile) at 1000 Mbps.



Route map for National Lambda Rail, an advanced research network. UA and ASU joined through CENIC, the regional network serving California, Nevada, and Arizona.

Although this is a new initiative, investments in Critical Core Infrastructure were made throughout fiscal years 2002 through 2006, funded through a proportional tax on the budgets of all other initiatives. These investments produced the following results:

- ◆ Completely renovated building network cabling and equipment for the Meinel Optical Sciences Building
- ◆ Elevated The University of Arizona’s Internet2 bandwidth from 155 Mbps to 1Gbps.
- ◆ Allowed The University of Arizona to join CENIC, a California based research and education network that provides access to National Lambda Rail
- ◆ Doubled the University’s supercomputing capability
- ◆ Brought immersive 3D visualization technology to campus as a shared resource

## FINANCIAL INFORMATION

REVENUE	FY07 Revised Budget	FY 2007 Actual	FY 2008 Revised Budget	FY 2009 Revised Budget	FY 2010 Revised Budget	FY 2011 Revised Budget
Carry Forward	\$18,869	\$18,869	\$62,883	-	-	-
TRIF Revenue	\$5,230,200	\$5,230,200	\$5,614,621	\$5,711,935	\$5,972,852	\$6,248,118
<b>Total Revenue</b>	<b>\$5,249,069</b>	<b>\$5,249,069</b>	<b>\$5,677,504</b>	<b>\$5,711,935</b>	<b>\$5,972,852</b>	<b>\$6,248,118</b>
EXPENDITURES						
Personal Services	-	-	-	-	-	-
Operations	\$968,800	\$1,786,186	\$1,180,883	\$968,000	\$968,000	\$968,000
Capital	\$4,281,069	\$3,400,000	\$4,496,621	\$4,743,935	\$5,004,852	\$5,280,118
<b>Total Expenditures</b>	<b>\$5,249,069</b>	<b>\$5,186,186</b>	<b>\$5,677,504</b>	<b>\$5,711,935</b>	<b>\$5,972,852</b>	<b>\$6,248,118</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales

Note: As a non-research initiative and pursuant to the new March 2007 Return on Investment (ROI) policy, ROI will not be calculated in FY 2007–2011.

From FY 2007 through FY 2011, \$968,000 per year will be allocated among projects as follows:

- ◆ \$268,000 per year in Operations for research building infrastructure improvements
- ◆ \$300,000 per year in Operations for advanced networking (CENIC, Internet 2)
- ◆ \$400,000 per year in Operations for high performance computing (supercomputer, visualization, etc.)

Over \$4M per year in Capital will be allocated to debt financing for new research-intensive buildings.

## GOALS

The Critical Core Infrastructure initiative will:

- ◆ Continuously upgrade Internet connectivity to research buildings
- ◆ Provide access for researchers to high performance networks such as CENIC, Internet2, and National Lambda Rail
- ◆ Provide more, better supercomputing capability
- ◆ Introduce important new technologies that enable cutting edge research
- ◆ Develop new research space for TRIF activities



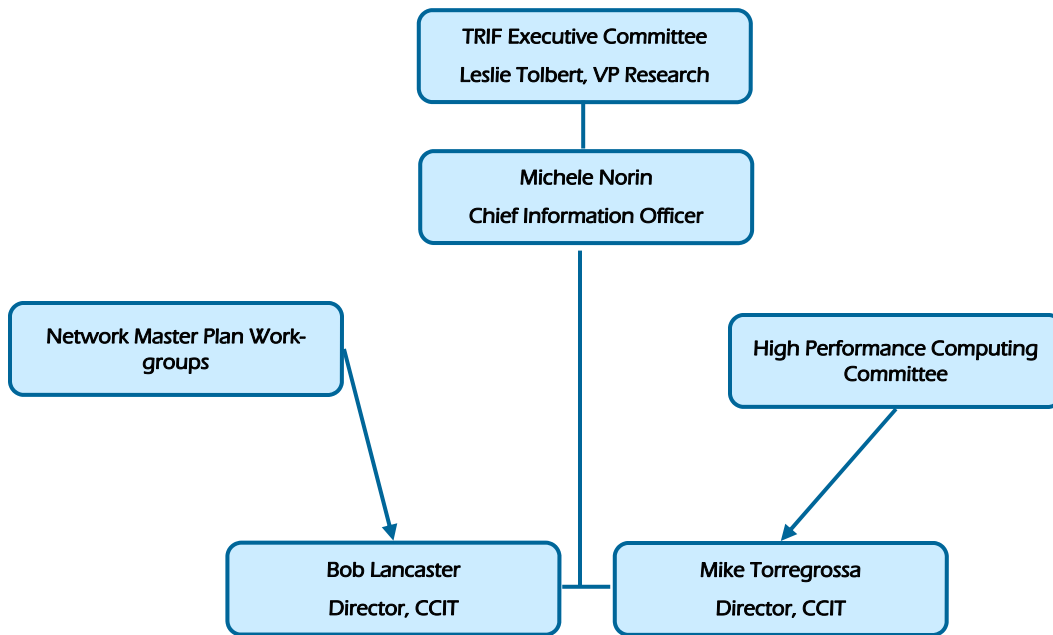
Panoramic view of AZ-LIVE, the environment used for immersive data visualization such as the dust storm project shown above. This new research facility serves not only advanced science and engineering, but also arts and humanities.

## MANAGEMENT

All UA TRIF initiatives report to Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development. Direct oversight of the computer infrastructure portion of this initiative is assigned to Michele Norin, Interim Chief Information Officer. Direct oversight for the capital investments will be by Dr. Tolbert and Dr. George Davis (Executive Vice President & Provost). Investment decisions are made by the UA TRIF Executive Committee: Dr. Tolbert (chair), Provost Davis, and all TRIF initiative leaders: Drs. Vicki Chandler (BIO5), Sally Jackson (Access), Pat Jones (Technology Transfer), Ron Marx (Workforce), Gene Sander (Water Sustainability), and Jim Wyant (Optics).

## ADVISORY BOARDS

There is no external advisory board for the Critical Core Infrastructure investments, since these investments are all in service of initiatives that have their own advisory boards. All IT projects are managed within the Center for Computing and Information Technology, under the direction of Bob Lancaster for network projects and under the direction of Mike Torregrossa for computing projects, both Directors of CCIT reporting to the CIO. Guidance on broad strategic decisions is provided by the TRIF Executive Committee and on more tactical decisions by the Campus IT Advisory Boards shown in the diagram below.



## LEARN MORE

Contact Michele Norin, Interim Chief Information Officer & Executive Director, at [norin@arizona.edu](mailto:norin@arizona.edu), 520-621-5972, or visit <http://trif.arizona.edu>

Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, University of Arizona, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513



TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)

# EVELYN F. MCKNIGHT BRAIN INSTITUTE

THE UNIVERSITY OF ARIZONA.

Arizona's First University.

September 1, 2007

## EVELYN F. MCKNIGHT BRAIN INSTITUTE

The Evelyn F. McKnight Brain Institute at The University of Arizona was created to stimulate and support research leading to the understanding of the neural basis for cognitive changes that occur during the process of normal aging. In 2011, the first of the very large Baby Boom generation (1946-64) will begin turning 65 years of age. A major source of anxiety of this generation is whether aging itself inevitably results in losing mental competence. One of the greatest challenges facing brain science in coming decades is to understand the biological basis of cognition and how these processes change over time, so that methods to reduce the negative impact of such changes can be developed. To be prepared for the dynamic shift in population demographics on the horizon, expectations for this period of life must be given from a platform of



*Evelyn F. McKnight Brain Institute member, Dr. David Euston, with electronic equipment for parallel electrical cell recordings in freely behaving animals.*

information rather than myth or conjecture. The goal of the Institute is both to develop the tools necessary for reaching such an understanding of the aging brain, using appropriate animals models as well as humans, and to implement these tools in well-designed studies that will characterize the nature of brain changes during normal aging and distinguish such normal changes in memory from those that reflect pathological conditions. Understanding normal aging is a prerequisite to early detection and treatment of disease states and to the development of approaches that optimize cognitive function in healthy older persons through to the oldest ages an individual is fortunate enough to live.

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*Dr. Carol A. Barnes  
Director, Evelyn F. McKnight  
Brain Institute*

The goal of the Evelyn F. McKnight Brain Institute is to use cutting edge interdisciplinary methods to accelerate progress toward understanding the neural basis for memory changes that occur during normal aging. To do this, the Institute will develop the tools to understand the aging brain, and to implement these tools in well-designed studies that characterize the nature of age-related brain changes that lead to memory changes, and to distinguish these alterations from pathological conditions.

## PERFORMANCE ANALYSIS

PERFORMANCE MEASURES	FY07 Proj	FY07 Actual	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<b>RETURN ON INVESTMENT</b>						
Federally Funded Research Grants	\$ 500,000	\$ 855,861	\$ 500,000	\$ 800,000	\$ 1,000,000	\$ 1,200,000
Private Foundation/Gifts	\$ 1,000,000	\$ 1,084,467	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Other Sources	\$ 350,000	\$ 350,000	\$ 350,000	\$ 350,000	\$ 350,000	\$ 350,000
Training Fellowships	\$ 35,000	\$ 42,886	\$ 35,000	\$ 70,000	\$ 70,000	\$ 70,000
Total Projected ROI	1 : 1:51	1 : 5.88	1:1:84	1 : 2.78	1 : 3.03	1 : 3.28
<b>TECHNOLOGY TRANSFER / INDUSTRY OUTREACH</b>						
Industrial Collaborations	2	2	2	2	2	2
Invention Disclosures		-	-	1	-	1
<b>WORKFORCE DEVELOPMENT</b>						
Undergraduate trainees in McKnight labs	4	7	4	5	5	6
Graduate trainees in McKnight labs	4	6	4	5	5	1
Postdoctoral trainees in McKnight labs	4	5	4	5	5	6
Research staff positions in McKnight labs	4	4	4	5	5	6
Faculty affiliates	10	15	11	12	13	14
<b>OUTREACH</b>						
National/International Meetings	1	1	1	1	1	1
Educational Outreach	10	22	10	10	10	10

# PERFORMANCE ANALYSIS

The establishment of the Evelyn F. McKnight Brain Institute at the University of Arizona was approved by the Arizona Board of Regents in June 2006. The McKnight Brain Research Foundation signed the agreement allocating \$5,000,000 to the Institute in October 2006. The first \$1,000,000 installment of the gift was received on November 1, 2006 and established the "Evelyn F. McKnight Chair for Learning and Memory in Aging." The first recipient is Carol A. Barnes, Ph.D., Regents' Professor and Director of the Evelyn F. McKnight Brain Institute.



*Dedication Ceremony for the UA Evelyn F. McKnight Brain Institute (Life Sciences North Building 3rd floor) was held on December 11, 2006. (Photo shows Barnes and Trustees of the McKnight Brain Research Foundation).*

Return on Investment: The \$5,000,000 match from the McKnight Brain Research Foundation will partner with the TRIF dollars to provide a firm

base for the Institute. Additionally, increased grant dollars are anticipated as a result of the technology developed from these funds.

Technology Transfer/Industry Outreach: Collaborations with established small businesses here in Tucson have been initiated with the goal to develop and commercialize tools for whole brain imaging at the single cell level, and massively parallel electrophysiological recording devices and acquisition and analysis systems. Multiple agreements are anticipated to emerge from these collaborations over the next 5 years.

Workforce contributions: Undergraduate students, graduate students, postdoctoral fellows and research staff will undergo training in McKnight labs in the experimental methods necessary to tackle the interdisciplinary research objectives of the Institute. Additionally, faculty across campus and the state of Arizona will be engaged to further the goals of the Institute.

Educational Outreach: National and International meetings will be organized to bring together top investigators in the world who conduct research on aging brain and memory. Public outreach will raise awareness of issues concerning aging.

# FINANCIAL INFORMATION

	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>						
Carry Forward	\$ 900,000	\$ 900,000	\$ 853,737	\$ -	\$ -	\$ -
New TRIF Revenue	\$ 350,500	\$ 350,500	\$ 170,000	\$ 800,000	\$ 800,000	\$ 800,000
<b>TOTAL REVENUE</b>	<b>\$ 1,250,500</b>	<b>\$ 1,250,500</b>	<b>\$ 1,023,737</b>	<b>\$ 800,000</b>	<b>\$ 800,000</b>	<b>\$ 800,000</b>
<b>EXPENDITURES</b>						
Personal Services	\$ 399,784	\$ 93,162	\$ 943,737	\$ 629,530	\$ 629,530	\$ 629,530
All Other Operating Expenses	\$ 850,716	\$ 303,601	\$ 80,000	\$ 170,470	\$ 170,470	\$ 170,470
Capital	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL EXPENDITURES</b>	<b>\$ 1,250,500</b>	<b>\$ 396,763</b>	<b>\$ 1,023,737</b>	<b>\$ 800,000</b>	<b>\$ 800,000</b>	<b>\$ 800,000</b>
<b>Return on Investment</b>	<b>1.51 : 1</b>	<b>5.88 : 1</b>	<b>1.84 : 1</b>	<b>2.78 : 1</b>	<b>3.03 : 1</b>	<b>3.28 : 1</b>

The initiative received \$350,000 in FY 07 and \$170,000 in FY 08 from the Venture Fund in support of new projects. Return on Investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by Arizona Board of Regents in March 2007. Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

# GOALS

The goal of the Evelyn F. McKnight Brain Institute is to stimulate and support research leading to the understanding of the neural basis for cognitive aging.

- ◆ The Institute will foster and fund interdisciplinary collaborations between faculty within the University and the state of

*(Continued on page 4)*

## GOALS

*(Continued from page 3)*

- Arizona who are linked by their interest in aging and memory.
- ◆ Using the high-density parallel neurophysiological recording methods, members of the Institute will explore dynamic changes in information processing characteristics of the aged brain.
- ◆ Institute members will refine instruments that enable whole brain imaging of behavioral experiences by partnering with Arizona-based high technology businesses.
- ◆ Institute members will partner with industry

to develop state of the art instruments and techniques for brain imaging and electrophysiological recording.

- ◆ Postdoctoral researchers, graduate students and undergraduate students will be recruited and trained in McKnight laboratories across campus.
- ◆ The Institute will organize conferences to promote collaborative research initiatives and education on the national and international level.

## MANAGEMENT

The Evelyn F. McKnight Brain Institute Director, Dr. Carol Barnes, reports to the Director of the Arizona Research Laboratories, Dr. Michael

Cusanovich, and to the Vice President for Research, Dr. Leslie Tolbert.

Dr. Barnes, Dr. Cusanovich and Dr. Tolbert are Regents' Professors at the University of Arizona.

## ADVISORY BOARDS

Two primary bodies will provide oversight of the operations and direction of the Evelyn F. McKnight Brain Institute at the University of Arizona. The first is the Scientific Advisory Board which is comprised of scientists who have significant research interests in aging and memory at the University of Arizona.

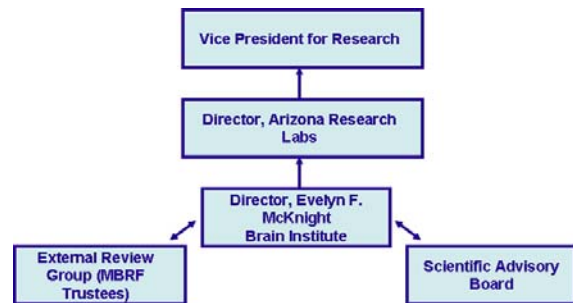
The second is the external review group which is comprised of the Trustees of the McKnight Brain Research Foundation.

### External Review Group:

- John G. Clarkson, M.D.
- J. Lee Dockery, M.D.
- Michael L. Dockery, M.D.
- Nina Ellenbogen Raim, M.D., J.D.

### Evelyn F. McKnight Brain Institute Scientific Advisory Board:

- Carol A. Barnes, Ph.D., (Director, Evelyn F. McKnight Brain Institute)
- Geoffrey L. Ahern, M.D., Ph.D.
- Elizabeth L. Glisky, Ph.D.
- Alfred W. Kaszniak, Ph.D.
- Bruce L. McNaughton, Ph.D.
- Naomi E. Rance, M.D., Ph.D.
- Lee Ryan, Ph.D.



## LEARN MORE

- ◆ Contact: Dr. Carol Barnes, Director, Evelyn F. McKnight Brain Institute, The University of Arizona, at carol@nsma.arizona.edu or 520-626-2312
- ◆ Contact: Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, The University of Arizona, at tolbert@email.arizona.edu or 520-621-3513
- ◆ Visit the Evelyn F. McKnight Brain Institute at <http://embi.nisma.arizona.edu>



## TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

### COLLEGE OF NURSING NURSING ONLINE PROGRAMS

THE UNIVERSITY OF ARIZONA.

Arizona's First University.

September 1, 2007

## COLLEGE OF NURSING ONLINE DEGREE AND CERTIFICATE PROGRAMS

The purpose of this initiative is to expand access to nursing education using internet related technologies for distance delivery of educational content. Its goals are aligned with previously funded TRIF initiatives, most notably *Aryplace Access for Arizonans*.

Several forces within the State of Arizona drive the need for electronic learning. While health care is undergoing dramatic changes impacted by explosive growth in knowledge and technologies, the health care delivery system has not consistently provided high-quality care to all Arizonans. There is a growing emphasis on improving health care quality through redesign of care processes, use of health information technologies, improved coordination of care among all members of the health care team, and redesigned performance and outcome measures. The availability of an expanded workforce of highly trained nursing professionals leveraging emerging knowledge and expertise is enabled by the ability of institutions of higher learning to disseminate education widely to meet the learning needs of students and ultimately the workforce needs of the state.

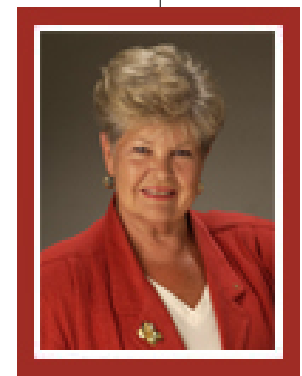


The University of Arizona College of Nursing recognized the imperative to reach out via electronic learning and acted upon this imperative with the introduction of the online Nursing Ph.D. program. This program admitted its first cohort of students in fiscal year 2003 and has since admitted 87 students in the online Ph.D program. The success of the online Ph.D program stimulated the introduction of the online Doctor of Nursing Practice (DNP) program as well as online Masters of Nursing (MS) and Graduate Certificate programs.

The University of Arizona's early investment in an online Ph.D. program in Nursing sets the standard for high impact: In an increasingly crowded distance education marketplace, this program remains almost singular nationwide, thereby delivering high impact despite modest numbers of enrollments. The College of Nursing endeavors to build upon this success by continuing to reach out to students who might otherwise be precluded from obtaining access to educational resources due to geography or time availability.

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Dr. Marjorie A. Isenberg  
Dean and Professor  
College of Nursing

## PERFORMANCE ANALYSIS

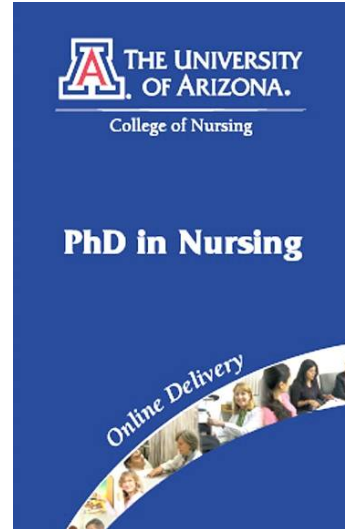
PERFORMANCE MEASURES	FY07 Proj	FY07 Actual	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<b>Return on Investment</b>						
Grants/Awards/Contracts Received	-	-	-	-	\$ 500,000	\$500,000
<b>Access/Workforce Contributions</b>						
Number of graduate students enrolled within initiative	169	152	181	191	197	205
Number of graduate degrees awarded	39	29	40	44	51	57
Number of certificates granted	8	10	8	9	5	3
<b>Curriculum Innovations</b>						
Number of newly revised courses offered	10	10	8	10	11	6
Number of new online courses offered	7	11	9	8	4	3
Number of new online programs offered	-	-	1	1	-	-
<b>Other Performance Metrics for this Initiative</b>						
Special program fees collected	\$250,000	\$372,126	\$270,000	\$290,000	\$300,000	\$315,000
New instructional tools acquired or created	1	-	2	2	-	-
Number of enrollments in existing online courses	273	252	285	295	301	309

*Note: The College of Nursing offers one undergraduate online course in addition to the graduate courses.*

## PERFORMANCE ANALYSIS

- ⇒ The College of Nursing has a well documented ability to attract Federal support for purposes of launching new programs, including the online Ph.D. and Nurse Practitioner programs, and ensuring ongoing support for these programs. To date over \$3.5 million dollars in federal grants have been awarded to support distance learning.
- ⇒ A primary purpose of this initiative is to increase the number of nursing graduates. The critical need for professional nurses is a driving force behind the decision of the College of Nursing to initiate online distance learning programs. As the College of Nursing has continued to introduce online opportunities, student enrollment has increased commensurately.
- ⇒ Educational outreach is primarily defined as the number of online courses created and revised for distance learning. At the present time, all of the graduate courses, and one undergraduate course, of the College of Nursing are deliverable in an electronic format. In addition, new courses are currently being developed for distance learning and original content, developed at the inception of the program, is being refreshed.
- ⇒ External collaborations are materially enhanced by

the ability to teleconference and monitor student progress in clinical settings remotely. Teleconferencing and streaming video has enabled collaborations with rural and border based health care delivery organizations.



Interested students can download the program brochure

## FINANCIAL INFORMATION

	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	
	Actual	Actual	Actual	Actual	Actual	Revised Budget	Actual	Revised Budget	Budget	Budget	Budget
<b>REVENUE</b>											
Carry Forward	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 350,000	\$ 350,000	\$ 4,538	\$ -	\$ -	\$ -
New TRIF Revenue	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 301,000	\$ 240,000	\$ 300,000	\$ 350,000
<b>TOTAL REVENUE</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 350,000</b>	<b>\$ 350,000</b>	<b>\$ 305,538</b>	<b>\$ 240,000</b>	<b>\$ 300,000</b>	<b>\$ 350,000</b>
<b>EXPENDITURES</b>											
Personal Services	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 194,700	\$ 116,341	\$ 195,000	\$ 195,000	\$ 260,000	\$ 292,500
All Other Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 155,300	\$ 229,121	\$ 110,538	\$ 45,000	\$ 40,000	\$ 57,500
Capital	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL EXPENDITURES</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 350,000</b>	<b>\$ 345,462</b>	<b>\$ 305,538</b>	<b>\$ 240,000</b>	<b>\$ 300,000</b>	<b>\$ 350,000</b>

This initiative received \$61,000 in FY 08 from the Venture Fund in support of new projects.. As a non-research initiative and pursuant to the new March 2007 Return on Investment (ROI) policy, ROI will not be calculated in FY 2007-2011. Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

The overarching goals of the College of Nursing online degree programs are to create educational opportunities for Arizona students and to respond to the healthcare needs of the populations of the State of Arizona.

- 1) *To increase the quality and years of healthy life for Arizona's populations*, students graduating from online programs will have the ability to contribute toward eliminating health disparities, assuring quality

safe health care, and improving the public health infrastructure

- 2) *To reduce health disparities among Arizona's populations*, particularly rural, aging, border and minority populations, the online programs address disparities among these groups by collaborating with regional and rural health service agencies to recruit and educate students, as appropriate.

## GOALS

As a state land-grant institution, the College of Nursing is focused upon serving the needs of students in Arizona for the purpose of improving health care. Students in Arizona are advantaged by online programs as these programs eliminate barriers to education related to:

- ⇒ Time
- ⇒ Geography
- ⇒ Culture
- ⇒ Career
- ⇒ Family Obligations



Research collaboration using online technology

## MANAGEMENT

All UA TRIF initiatives report to Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development. Direct oversight of the College of Nursing Online Programs is provided by Dr. Marjorie A. Isenberg, Dean and Professor of the University of Arizona College of Nursing.

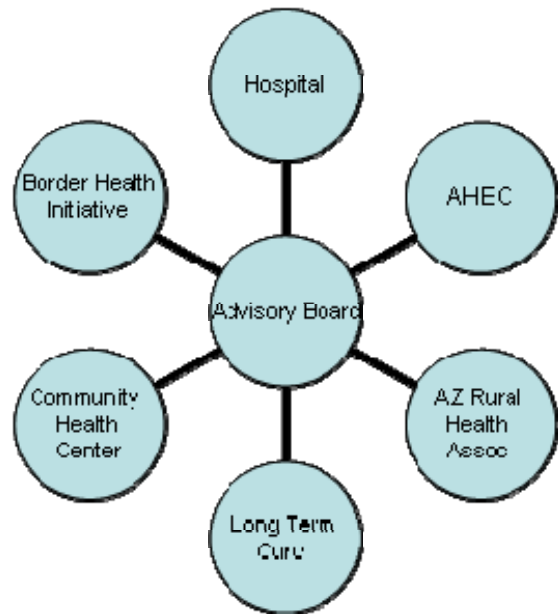
Additional oversight is provided by senior faculty members within the College of Nursing:

Dr. Sally Reel, Associate Dean for Nursing Practice, DNP, Masters and Certificate programs.

Dr. Leslie Ritter, Associate Professor, Ph.D. program

## ADVISORY BOARDS

An advisory board has been established and will meet at least twice each year to provide ongoing input and guidance into planning and implementing the program for maximum utility. Advisory board participants will include representation from the College of Nursing, affiliated partner institutions, and health services planning and delivery agencies. Particular attention will be paid to the inclusion of representatives from rural and border areas within the state as well as individuals associated with agencies promoting distance learning for minority students. Board members will be identified from the Arizona Rural Health Association, Area Health Education Centers (AHEC), Border Health Initiatives, hospitals, Community Health Centers, long term and chronic care facilities (including home health, skilled nursing and assisted care centers).



To date, the following individuals have agreed to serve on the Advisory Board:

- Isela Luna, Pima County Health Dept.
- Peggy MacMacken, Carondelet St. Joseph's Hospital
- Dr. Sally Reel, Director of AHEC, College of Nursing
- Richard Polheber, Holy Cross Hospital, Nogales, AZ

## LEARN MORE

Contact Dr. Marjorie Isenberg, Dean and Professor, College of Nursing at (520)626-6152

Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, The University of Arizona, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or (520)621-3513

Visit our website at <http://www.nursing.arizona.edu>



**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)**

**OPTICAL SCIENCES AND TECHNOLOGY**

**THE UNIVERSITY OF ARIZONA.**

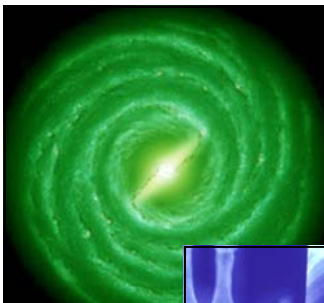
Arizona's First University.

September 1, 2007

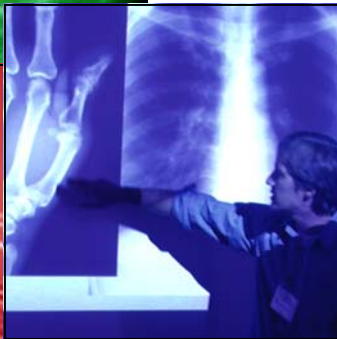
The University of Arizona College of Optical Sciences is home to the TRIF Optical Sciences and Technology Initiative. The initiative is multidisciplinary, with the College of Optical Sciences forming the core of the initiative. Through joint faculty appointments, cooperative research initiatives, and multidisciplinary outreach events, the optics college partners with the College of Science, the College of Engineering, and the College of Medicine to develop new technologies that will power the future of nearly every field of science and technology.

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The impact of optics on the economy of the State of Arizona and the country as a whole in the coming years is staggering. The market for optics in communication, medical care, heavy industry, sensing and security, and military exceeds \$200 billion per year.



The mission of the TRIF Optical Sciences and Technology Initiative is to further enhance the University's international preeminent optics program through the development of novel initiatives in optics education, research, workforce development, and industry outreach.



*The optics initiative is multidisciplinary, with the College of Optical Sciences forming the core. The initiative targets three critical areas: photonics (red), imaging (blue), and astronomical optics (green).*



*Dr. James C. Wyant  
Dean, College of Optical Sciences*

# PERFORMANCE ANALYSIS

PERFORMANCE METRICS (\$ in millions)																
	FY02 Proj	FY02 Actual	FY03 Proj	FY03 Actual	FY04 Proj	FY04 Actual	FY05 Proj	FY05 Actual	FY06 Proj	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<b>RETURN ON INVESTMENT</b>																
Sponsored Awards (in \$)											\$16,000	\$21,749	\$16,350	\$16,700	\$17,050	\$17,400
Patent Royalty income (in \$)											\$0,055	\$0,050	\$0,060	\$0,065	\$0,070	\$0,075
New federally funded major optics projects		2		2		11		2	1	5						
New federally funded major optics projects (in \$)		\$11,325		\$3,398		\$19,940		\$2,428	\$1,500	\$6,044						
New industrial funded major optics projects									2	2						
New industrial funded major optics Projects (in \$)									\$1,000	\$3,633						
<b>RESEARCH DEVELOPMENT</b>																
Optics research proposals submitted (in \$)									\$9,000	\$29,000	\$25,000	\$83,025	\$20,300	\$20,600	\$20,900	\$21,200
New affiliate sponsors obtained		11		3		14		3	2	6	2	4	4	4	6	6
New affiliate sponsors obtained (in \$)		\$0,096		\$0,019		\$0,110		\$0,019	\$0,017	\$0,080	\$0,017	\$0,041	\$0,034	\$0,034	\$0,051	\$0,051
New faculty hired	4	3	4	6	2	0	2	1	2	1	2	3	2	2	2	2
<b>WORKFORCE DEVELOPMENT</b>																
Growth in optics-related undergraduate enrollment	10	12	15	25	15	44	0	25	0	-12	4	-40	6	4	6	4
Growth in optics-related graduate enrollment	10	30	10	15	10	21	0	0	0	23	3	15	4	3	4	4
Growth in in optics-related distanc. learning enrollment	5	3	10	48	10	32	10	32	5	23	5	-8	8	8	10	10
<b>TECH TRANSFER AND INDUSTRY OUTREACH</b>																
Number of optics-related start-up companies	2	2	1	1	0	0	0	0	1	1	0	0	1	0	1	1
Number of optics-related patent/provisional filings	2	15	2	15	2	10	2	17	7	23	7	21	8	10	10	12
Industry outreach activities		4	4	4	4	5	4	4	4	5	4	5	4	4	4	4
Optics-related Invention Disclosures submitted											25	27	27	29	31	33
<b>EDUCATIONAL OUTREACH</b>																
Public workshops, seminars and presentations		3		2		2		2	1	3	1	8	1	1	2	2
K-12 outreach presentations and summer camp		4		3		4		4	4	12	4	9	4	4	4	4
Website enhancements		2		4		2		2	2	2						

**Explanation of ROI Calculations:**

ROI calculation for FY02 through FY06: Annual New federally funded major optics projects plus New industrial funded major optics projects plus New affiliate sponsors obtained (in \$'s) divided by annual TRIF Optical Sciences and Technology Initiative Total Expenditures

ROI calculation for FY07 to FY11: Annual Sponsored Awards plus Patent Royalty income divided by annual TRIF Optical Sciences and Technology Initiative Total Expenditures. Sponsored Awards and Patent Royalty income included for university personnel receiving TRIF Optical Sciences and Technology Initiative funding as defined in the ABOR approved ROI Formula.

Note: Undergraduate enrollment decline is due to increased college admission requirements and large undergraduate graduating classes in FY06 and FY07

## PERFORMANCE ANALYSIS

Research and Technology Development portion of the TRIF Optical Sciences and Technology Initiative focuses on development of novel photonic and imaging/sensor components along with state of the art astronomical optics through the use of seed funding and matching funds for projects that are designed for prototyping and/or proof of concept for early stage technologies. The number of externally funded research awards and technology transfer transactions are direct measures of this activity.

Workforce Development is a major objective of the TRIF Optical Sciences and Technology Initiative at the University of Arizona. The measures of the optics workforce development include the development of two-year degree programs at community colleges, expansion of undergraduate/ graduate and distance learning programs, fellowships to support graduate research projects, development of new courses for industrial training purposes, and outreach to K-12.

Technology Transfer and Industry Outreach is defined by collaborations with our optics industry partners in the development and commercialization of new technology, affiliate sponsorships, development of industry related training courses and distance learning program, and new start-up companies.



Educational Outreach is intended to introduce students to various career opportunities in Optics through visits to K-12 and community colleges with a special focus on under-represented populations, workshops and optics summer camps, and symposiums in imaging and photonics.

## FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward	\$ -	\$ 1,535,952	\$ 324,825	\$ 366,298	\$ 1,230,225	\$ 135,586	\$ 135,586	\$ 594,471	\$ -	\$ -	\$ -
New TRIF Revenue	\$ 4,395,646	\$ 4,803,518	\$ 4,521,523	\$ 4,491,847	\$ 4,047,769	\$ 3,646,492	\$ 3,646,492	\$ 3,755,667	\$ 3,275,667	\$ 3,275,667	\$ 3,275,667
<b>TOTAL REVENUE</b>	<b>\$ 4,395,646</b>	<b>\$ 6,339,470</b>	<b>\$ 4,846,348</b>	<b>\$ 4,858,145</b>	<b>\$ 5,277,994</b>	<b>\$ 3,782,078</b>	<b>\$ 3,782,078</b>	<b>\$ 4,350,138</b>	<b>\$ 3,275,667</b>	<b>\$ 3,275,667</b>	<b>\$ 3,275,667</b>
<b>EXPENDITURES</b>											
Personal Services	\$ 1,004,904	\$ 1,781,270	\$ 2,688,414	\$ 2,209,066	\$ 2,575,898	\$ 3,086,138	\$ 2,143,214	\$ 3,764,271	\$ 2,789,550	\$ 2,863,800	\$ 2,941,725
All Other Operating Expenses	\$ 854,790	\$ 3,233,375	\$ 791,636	\$ 418,854	\$ 566,510	\$ 695,940	\$ 1,044,393	\$ 585,867	\$ 486,117	\$ 411,867	\$ 333,942
Capital	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL EXPENDITURES</b>	<b>\$ 2,859,694</b>	<b>\$ 6,014,645</b>	<b>\$ 4,480,050</b>	<b>\$ 3,627,920</b>	<b>\$ 4,142,408</b>	<b>\$ 3,782,078</b>	<b>\$ 3,187,607</b>	<b>\$ 4,350,138</b>	<b>\$ 3,275,667</b>	<b>\$ 3,275,667</b>	<b>\$ 3,275,667</b>
Return on Investment	4.0:1	.6:1	4.5:1	.7:1	1.9:1	4.3:1	6.8:1	3.8:1	5.1:1	5.2:1	5.3:1

To match HB 2661 General Adjustments given to state-funded employees, \$75,667 from the Venture Fund was allocated to this initiative for its personnel.

This initiative received \$350,000 in FY 07 and \$480,000 in FY 08 from the Venture Fund in support of new projects.

Return on investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by the Arizona Board of Regents in March 2007, which is different from the ROI methodology used to calculate ROI in FY 2002-2006.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters

## GOALS

The TRIF Optical Sciences and Technology Initiative will promote the field of optics by:

- The development of new technologies in Photonics, Imaging and Sensors and Astronomical Optics
- Working closely with our industry partners and the

University Office of Technology Transfer to identify research products that have potential for technology transfer

- Increasing the number of Optics related spin-off companies

*(Continued on page 4)*

## GOALS

(Continued from page 3)

- Supporting workforce development through continued expansion of instructional and outreach programs in K-12 and community colleges, providing fellowships to support graduate student research in imaging and photonics, expansion of the undergraduate, graduate and distance learning Optics programs, development of new course curriculums to meet industry needs, and further

- expansion of the MBA/Masters in Optics program
- Developing a special focus on under-represented populations to introduce them to optics careers
- Increasing the number of world-class faculty in Optics and the number of major optics research projects



Professor Jose Sasian develops innovative course material for the Opti 517, Lens Design class.

## MANAGEMENT

Dr. James C. Wyant, Chair of the TRIF Optics Committee, reports to Dr. Leslie Tolbert, the Vice President for Research, Graduate Studies and Economic Development, for the TRIF Optics Initiative.

## ADVISORY BOARDS

### TRIF Optics Committee

**James C. Wyant** (Chair): Dean and Professor; Optical Sciences, Professor; Electrical & Computer Engineering.  
**Arthur F. Gmitro**: Professor; Radiology and Optical Sciences.  
**Thomas Peterson**: Dean; Engineering, Professor; Chemical & Environmental Engineering. **Nasser Peyghambarian**: Professor; Optical Sciences, Materials Science & Engineering, Chair; Lasers & Photonics. **Joaquin Ruiz**: Dean; Science, Professor; Geosciences.

### External Review Committee

**Bruce Wright** (Chair): UA Associate Vice President; Economic Development. **Robert Breault**: CEO; Breault Research Organization. **Richard Juergens**: Engineering Manager; Raytheon. **Glenn Sincerbox**: Professor Emeritus; Optical Sciences.

### TRIF Astronomical Optics Faculty Advisory Committee

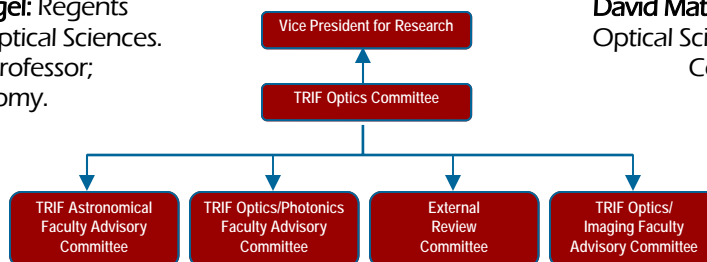
**Peter Strittmatter** (Chair): Department Head; Astronomy, Regents Professor; Astronomy, Director; Steward Observatory. **J. Roger P. Angel**: Regents Professor; Astronomy and Optical Sciences.  
**James H. Burge**: Associate Professor; Optical Sciences and Astronomy.  
**Jose Sasian**: Professor; Optical Sciences and Astronomy.

### TRIF Optics/Imaging Faculty Advisory Committee

**Arthur F. Gmitro** (Chair): Professor; Radiology and Optical Sciences. **J. Roger P. Angel**: Regents Professor; Astronomy and Optical Sciences. **Jennifer K. Barton**: Associate Professor; Biomedical Engineering, Electrical & Computer Engineering, Optical Sciences. **Robert H. Brown**: Professor; Planetary Sciences. **Eustace L. Dereniak**: Professor; Optical Sciences. **Michael R. Descour**: Associate Professor; Optical Sciences. **James T. Schwiegerling**: Associate Professor; Ophthalmology and Optical Sciences.

### TRIF Optics/Photonics Faculty Advisory Committee

**Nasser Peyghambarian** (Chair): Professor; Optical Sciences, Materials Science & Engineering, Chair; Lasers & Photonics.  
**Neal R. Armstrong**: Professor; Chemistry and Optical Sciences. **Jerome V. Moloney**: Professor; Applied Mathematics and Optical Sciences. **Joseph Simmons**: Department Head and Professor; Materials Science & Engineering, Professor; Optical Sciences. **Masud Mansuripur**: Professor; Optical Sciences, Chair; Optical Data Storage Center.  
**David Mathine**: Assistant Professor; Optical Sciences and Electrical & Computer Engineering.



## LEARN MORE

- Contact James C. Wyant, Dean, College of Optical Sciences at [jcwyant@optics.arizona.edu](mailto:jcwyant@optics.arizona.edu) or 520-621-2448
- Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513.
- Visit the College of Optical Sciences Website at [www.optics.arizona.edu](http://www.optics.arizona.edu)



**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)**

**TECHNOLOGY TRANSFER INFRASTRUCTURE**

**THE UNIVERSITY OF ARIZONA.**

Arizona's First University.

September 1, 2007



Technology transfer's emergence with entrepreneurship as one of the organizing principles of activity within universities coincides with the growth in importance of knowledge-based industries to the health of local and state economies. The technology transfer infrastructure plan is building the necessary infrastructure to move research activity from the laboratory to the marketplace, supporting UA's goal to be a driver of Arizona's knowledge-based economy.



*dMetrix, a UA startup, is a Tucson-based developer of digital pathology instruments*

By integrating technology transfer into university activities, it enhances Arizona's knowledge-based workforce development and the creation of new knowledge-based industries.

The technology transfer infrastructure plan supports the creation of a thought-leading, nationally-recognized technology transfer program bringing UA innovations into broad public and commercial use. This infrastructure initiative supports the collaborative environment

for research within UA exemplified by the TRIF Research Programs. Working together with those programs, the plan integrates their translational efforts with economic development and market activities driven by UA's Office of Economic Development (OED) and Office of Technology Transfer (OTT).

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*Dr. Patrick Jones,  
Director Technology Transfer*



*Bruce A. Wright  
Associate Vice President  
For Economic Development*

# PERFORMANCE ANALYSIS

PERFORMANCE MEASURES	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11					
	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Proj					
<b>Return on Investment</b>															
Gross Royalty Revenues	\$575,515	\$714,415	\$720,645	\$1,076,870	\$900,804	\$1,008,621	\$1,126,007	\$1,175,915	\$1,407,509	\$1,688,857	\$1,520,000	\$1,670,000	\$1,820,000	\$1,970,000	\$2,110,000
License-Based Cost Recovery	N/P	\$68,968	N/P	\$277,401	N/P	\$332,075	\$325,000	\$280,486	\$357,500	\$423,302	\$393,250	\$432,575	\$475,833	\$523,416	\$575,757
Sponsored Research Contracts	N/P	N/A	N/P	\$615,527	N/P	\$847,175	\$600,000	\$610,000	\$600,000	\$768,900	\$600,000	\$600,000	\$600,000	\$600,000	\$600,000
Direct Grant Support OTT&OED	N/P	\$30,000	N/P	\$30,000	N/P	\$30,000	N/P	\$30,000	\$150,000	\$202,817	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
<b>Total Revenues</b>		<b>\$813,383</b>		<b>\$1,999,798</b>		<b>\$2,217,871</b>		<b>\$2,096,401</b>	<b>\$2,515,009</b>	<b>\$3,083,876</b>	<b>\$2,713,250</b>	<b>\$2,902,575</b>	<b>\$3,095,833</b>	<b>\$3,293,416</b>	<b>\$3,485,757</b>
<b>Total TRIF Expenditures</b>		<b>\$367,735</b>		<b>\$577,644</b>		<b>\$558,834</b>		<b>\$762,795</b>		<b>\$1,090,377</b>	<b>\$826,810</b>	<b>\$825,210</b>	<b>\$825,210</b>	<b>\$825,210</b>	<b>\$825,210</b>
<b>Economic Development</b>															
Total Startup Companies	3	5	4	1	5	4	6	5	8	3	8	2	8	9	9
AZ-based Startups	N/P	5	N/P	0	N/P	3	N/P	4	4	3	6	1	6	7	7
UA Tech Licensed to AZ Companies	N/P	6	N/P	14	N/P	5	N/P	18	N/P	11	N/P	8	N/P	N/P	N/P
<b>TIP Plan Metrics</b>															
Licenses & Options Executed	N/P	18	N/P	24	N/P	25	30	32	35	26	38	30	40	43	45
Major Agreements Executed	N/P	25	N/P	27	N/P	39	N/P	47	N/P	42	58	41	60	63	68
Patent Applications Filed	57	62	69	77	83	91	100	106	105	109	105	121	110	115	125
U.S. Patents Issuing	9	8	10	12	15	18	18	10	20	13	20	11	23	26	32
Disclosures Received	128	109	154	111	185	95	125	102	125	88	135	104	150	165	180
% Disclosures Licensed	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	50%	N/P	55%	60%	70%
Strategic Partnerships	1	1	1	1	1	2	1	2	1	1	1	2	1	1	1
<b>Economic Analysis</b>															
OED Reports	0	0	1	0	0	1	1	1	1	0	1	2	1	1	1
<b>Workforce Development</b>															
Student Interns	1	1	1	1	2	2	2	2	3	5	4	5	4	5	6
Specialized Programs or Workshops	0	0	0	0	1	1	1	1	2	2	2	4	2	2	2
Courses Offered	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

## PERFORMANCE ANALYSIS

- Return on investment is measured by examining the total numbers of dollars invested vs. the number of dollars contributing to direct revenue through licenses, options and grant dollars to OTT and OED in support of their programs as well as indirect revenue contributions of sponsored research support from OTT agreements. The measures listed above are based on our performance through FY 2006.

- Economic development measures are based upon start-ups licensing UA technology that is fundamental to their formation, the number of those start-ups choosing to operate in Arizona, as well as, the number of UA Technologies licensed by existing companies in Arizona.



In 1989, Evan Hersh, M.D., of the Arizona Cancer Center, founded a new company, Amplimed. Years later he and his colleagues rediscovered a drug that showed great promise in stimulating the body's immune response. Now the drug, called Amplimexon, has been approved for Phase I clinical trials for patients with multiple myeloma, malignant melanoma and pancreatic cancer.

- TTIP plan metrics

include a variety of metrics that capture operational scope, efficiency and relevance of OTT. This includes agreements executed, patents and patent applications, and disclosures received. For some of the measures provided here no projections (N/P) were made in the original planning or metrics for the renewal are changing to better reflect the proposed activities.

*"The Office of Economic Development provides critical data and analysis for assessing the impact of TRIF dollars."*

- Economic analysis by OED is designed to measure the effectiveness of the University's TRIF initiatives as well as their economic impact on Arizona's economy and its industry clusters.
- Workforce contributions occur in a variety of ways, however for purposes of this initiative we count only those who intern in either OED or OTT, or take part in educational efforts directly created and supported by OTT and OED.

## FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward	\$0	\$117,080	\$115,858	\$260,372	\$301,469	\$172,938	\$172,938	\$32,829	\$0	\$0	\$0
New TRIF Revenue	\$484,815	\$576,422	\$703,348	\$803,892	\$961,846	\$826,810	\$826,810	\$825,210	\$825,210	\$825,210	\$825,210
<b>TOTAL REVENUE</b>	<b>\$484,815</b>	<b>\$693,502</b>	<b>\$819,206</b>	<b>\$1,064,264</b>	<b>\$1,263,315</b>	<b>\$999,748</b>	<b>\$999,748</b>	<b>\$858,039</b>	<b>\$825,210</b>	<b>\$825,210</b>	<b>\$825,210</b>
<b>EXPENDITURES</b>											
Personal OTT	\$72,731	\$219,485	\$198,453	\$267,930	\$354,832	\$338,379	\$333,486	\$323,844	\$289,844	\$289,844	\$289,844
All Other Operating Expenses OTT	\$33,800	\$68,696	\$34,638	\$38,155	\$98,634	\$38,607	\$39,906	\$45,000	\$56,000	\$56,000	\$56,000
Patenting OTT	\$207,918	\$15,437	\$18,503	\$98,483	\$128,980	\$217,443	\$213,684	\$126,660	\$149,660	\$149,660	\$149,660
Expenditures OTT	\$314,449	\$303,618	\$251,594	\$404,568	\$582,446	\$594,429	\$587,076	\$495,504	\$495,504	\$495,504	\$495,504
Personal OED	\$10,220	\$114,394	\$170,953	\$208,038	\$205,138	\$378,231	\$241,532	\$309,035	\$246,206	\$246,206	\$246,206
All Other Operating Expenses OED	\$43,066	\$159,632	\$136,287	\$150,189	\$183,993	\$27,088	\$138,311	\$53,500	\$83,500	\$83,500	\$83,500
Expenditures OED	\$53,286	\$274,026	\$307,240	\$358,227	\$389,131	\$405,319	\$379,843	\$362,535	\$329,706	\$329,706	\$329,706
Capital	\$0	\$0	\$0	\$0	\$118,800	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL EXPENDITURES</b>	<b>\$367,735</b>	<b>\$577,644</b>	<b>\$558,834</b>	<b>\$762,795</b>	<b>\$1,090,377</b>	<b>\$999,748</b>	<b>\$966,919</b>	<b>\$858,039</b>	<b>\$825,210</b>	<b>\$825,210</b>	<b>\$825,210</b>

To match HB 2661 General Adjustments given to state-funded employees, \$25,210 from the Venture Fund was allocated to this initiative for its personnel. As a non-research initiative and pursuant to the new March 2007 Return on Investment (ROI) policy, ROI will not be calculated in FY 2007-2011. Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

The Technology Transfer Infrastructure Plan goals are to:

- enhance the technology transfer infrastructure
- increase significantly the level and breadth of technology transfer from the university
- increase engagement in technology transfer by the faculty, staff and students

- assist efforts to commercialize university technology
- connect these efforts into both State and local community economic development efforts

Building upon the success of the first phase of TRIF support, the second phase of funding will solidify the creation of a scalable infrastructure for technology

*(Continued on page 4)*

## GOALS

(Continued from page 3)

transfer, support the implementation of value-added partnerships with other TRIF initiatives and further link activities in technology transfer within UA and in the community, especially through Arizona’s economic clusters.

**About the Technology Transfer Infrastructure Plan:** The Technology Transfer Infrastructure Plan is a two-part initiative under the TRIF program to continue to enhance the University of Arizona’s infrastructure for technology transfer and enhancing associated economic

development in Arizona. The Technology Transfer Infrastructure Plan provides support for both the UA Office of Technology Transfer and the UA Office of Economic



More than 20 years of research by UA Pharmacy Professors Elaine and Myron Jacobson have produced an innovative product to treat sun damaged skin. “The UA fosters great research that leads to innovative technologies,” Dr. Jacobson says. “And researchers here are encouraged to take the next step to turn discoveries into products that help people and boost the local economy.”

## MANAGEMENT

Bruce Wright, Associate Vice President for Economic Development, and Patrick Jones, Director of Technology Transfer, report to Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development. Reporting to Mr. Wright are the Directors

of the Office of Economic Development, the Office of Economic and Policy Analysis, the UA Science and Technology Park, and the Arizona Center for Innovation. Reporting to Dr. Jones are the Internal Patent Counsel, Manager of Outreach, and a group of four licensing professionals.

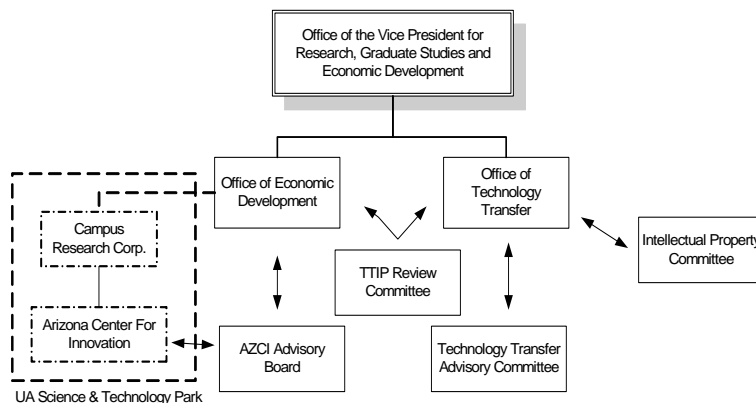
## ADVISORY BOARDS

**TTIP Review Committee:** Mr. Larry Aldrich, General Partner, Valley Ventures □ Dr. Gary Libecap, Professor of Economics and Entrepreneurship, University of California—Santa Barbara □ Dr. Colin Kaltenbach, Professor and Director of Extension, College of Agriculture and Life Sciences

**Technology Transfer Advisory Committee:** Robert Hagen, Chair, Southern Arizona Tech Council □ Prabhu Dayal, EUEC and Chair, Environmental Cluster □ Robert Breault, CEO, Breault Research □ Bruce Wright, AVP for Economic Development, University of Arizona □ Nick Soloway, Partner, Hayes Soloway, LLP □ Nancy Russell, Dean of Business

Programs, Pima Community College □ and other members of the economic clusters of Southern Arizona.

**Arizona Center for Innovation Advisory Board:** Larry Aldrich, General Partner, Valley Ventures □ Kendall Burt, City of Tucson □ Eugene Cochran, RCT □ Mike DeConcini, Sr. VP, Unisource Energy □ Steven Fell, President, Bank One □ Robert Fortuno, Esq. □ Harry George, Solstice Capital □ and other community members



**Intellectual Property Committee:** An internal board of faculty from Engineering, Science and Medicine providing policy oversight of OTT appointed by the OVPR and the Faculty Senate.

## LEARN MORE

- ◆ Contact Dr. Patrick Jones, Director, Office of Technology Transfer, at [pljones@ott.arizona.edu](mailto:pljones@ott.arizona.edu) or 520-621-5000.
- ◆ Contact Mr. Bruce Wright, Associate Vice President for Economic Development, The University of Arizona, [wrightb@u.arizona.edu](mailto:wrightb@u.arizona.edu) or 520-621-4088.
- ◆ Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, The University of Arizona, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513.
- ◆ Visit the OTT or OED websites at [www.ott.arizona.edu](http://www.ott.arizona.edu) or [www.oed.arizona.edu](http://www.oed.arizona.edu)



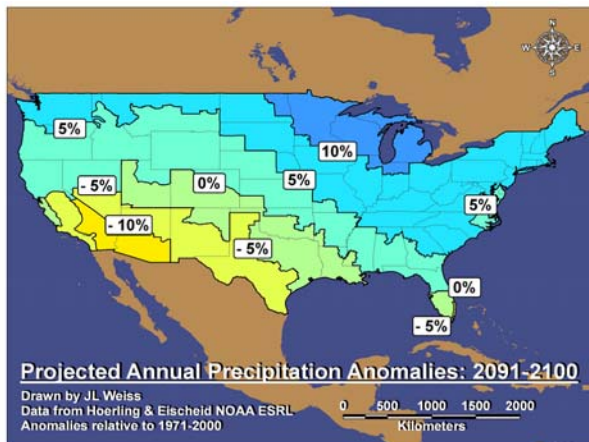
TRANSLATIONAL ENVIRONMENTAL RESEARCH

THE UNIVERSITY OF ARIZONA.  
Arizona's First University.

September 1, 2007

TRANSLATIONAL ENVIRONMENTAL RESEARCH (TER)

Arizona and other arid/semiarid regions of the Earth face dual challenges: population is growing rapidly, while life-supporting natural resources remain



limited. For example, the most recent assessments of future likely climate change indicate that water availability and ecosystem health (e.g., forests and range) could become more limiting in the future. Arizona is well positioned to innovate to meet the challenge of preserving growth dynamics and quality of life within the state, and to be the primary source of knowledge and technology needed by society. As the

premier Land-Grant Institution located in the southwestern United States, UA has the infrastructure and knowledge available to address these issues through well-crafted integration and translation of basic and applied knowledge. The need for such integration is recognized by funding agencies that are allocating an increasing fraction of their budgets to large multi-disciplinary requests for proposals. A parallel need exists for coordinated graduate training in environmental science that spans the campus, and that facilitates cultivation of interdisciplinary expertise while preserving disciplinary depth. Enhanced coordination of programs across campus is essential to increasing UA's competitiveness for research support, while at the same time producing more effective public- and private-sector partnerships and a higher-caliber work force. Also critical is the provision of decision support systems designed with the translational objectives of informing the public, promoting a sound basis for decision making, and facilitating the implementation of sustainable technologies and knowledge systems in the private and public sectors. These systems, plus a broader range of technological solutions, will be a major driver of economic growth within –and beyond – Arizona.

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*Dr. Jonathan Overpeck  
Director, Translational  
Environmental Research*

TER aims to address these needs by providing support for seven interrelated new initiatives: (i) Engineering for a Sustainable Environment, (ii) Environmental Informatics and Decision Support, (iii) Economics, Law, Policy, and the Environment, (iv) Environmental Entrepreneurship, (v) Biogeochemistry and Ecosystem Dynamics, (vi) Climate and Hydrometeorology, and (vii) Environment and Health. Together, these seven initiatives serve critical needs within the state of Arizona for the kinds of environmental technology and knowledge that can address the pressing challenges posed by environmental and societal changes that have already begun.



## PERFORMANCE ANALYSIS

PERFORMANCE MEASURES	FY07 Proj	FY07 Actual	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<b>Return on Investment (\$ in Millions)</b>						
Federal Grants Received	\$ -	\$ 71,195	\$ 1,000,000	\$ 1,200,000	\$ 1,600,000	\$ 2,000,000
Private foundation / Gifts	\$ -	\$ 4,450,423	\$ 10,000	\$ 15,000	\$ 20,000	\$ 25,000
Other sources	\$ 50,000	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
Training Grants	\$ -	\$ -	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
ROI = Awards / TRIF expenditures	0.07 : 1	66.58 : 1	0.94 : 1	4.38 : 1	3.49 : 1	4.00 : 1
<b>Economic Development</b>						
Private-sector collaborations	-	1	1	3	5	10
Public-sector collaborations	5	15	10	15	20	30
<b>Technology Transfer</b>						
Licenses/options	-	1	1	2	4	6
<b>Workforce Contributions</b>						
Graduate students pursuing degrees in interdisciplinary environmental studies/earth sciences	10	28	30	30	30	40
<b>Environmental/Earth Science Promotion</b>						
Presentations/exhibits	10	25	20	25	30	30
Workshops and conferences supported	2	3	2	2	2	2

Activities supported by TER funding focus on three primary areas: (a) building faculty work force, innovation, and expertise in areas where significant progress can be made in addressing pressing society-environment problems; (b) fostering development of innovative decision-support systems based on principles of translational science; and (c) fostering innovation in communication, dissemination, and use of science for decision and policy making purposes. Measures of success include the number and dollar value of federal grants written and received; number of new faculty active in TER; number of collaborations with public and private sector entities; number of licenses, options, patents pursued, and graduate students pursuing relevant degrees; and promotional activities designed to facilitate the sharing of knowledge and technological advances. In 2007 we are pleased to have played a key role in securing \$30 million to run the new UA Biosphere 2 and B2 Institute.

### FINANCIAL INFORMATION

	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>						
Carry Forward	\$ -	\$ -	\$ 722,904	\$ -	\$ -	\$ -
New TRIF Revenue	\$ 790,822	\$ 790,822	\$ 506,184	\$ 311,883	\$ 506,761	\$ 543,676
<b>TOTAL REVENUE</b>	<b>\$ 790,822</b>	<b>\$ 790,822</b>	<b>\$ 1,229,088</b>	<b>\$ 311,883</b>	<b>\$ 506,761</b>	<b>\$ 543,676</b>
<b>EXPENDITURES</b>						
Personal Services	\$ 597,080	\$ 40,347	\$ 1,112,304	\$ 259,600	\$ 389,400	\$ 421,850
All Other Operating Expenses	\$ 193,742	\$ 27,571	\$ 116,784	\$ 52,283	\$ 117,361	\$ 121,826
Capital	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL EXPENDITURES</b>	<b>\$ 790,822</b>	<b>\$ 67,918</b>	<b>\$ 1,229,088</b>	<b>\$ 311,883</b>	<b>\$ 506,761</b>	<b>\$ 543,676</b>
<b>Return on Investment</b>	<b>0.07 : 1</b>	<b>66.58 : 1</b>	<b>0.94 : 1</b>	<b>4.38 : 1</b>	<b>3.49 : 1</b>	<b>4.00 : 1</b>

\*Return on Investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by Arizona Board of Regents in March 2007.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

The TRIF Translational Environmental Research initiative is guided by the following goals:

- Enhancement of UA research and technology development prowess in the seven initiatives
- Improvement in quality and quantity of private and public sector work force pools
- Success of TER-public and TER-private partnerships in reducing vulnerability and increasing economic opportunity in the face of environmental change
- Growth in environmental entrepreneurship and business growth through transfer of knowledge/technologies to private-sector firms and public-sector agencies
- Increased recognition of Arizona as a center of innovation in translational environmental research and application
- Growth of UA stature in the field of translational environmental science

## MANAGEMENT

### Jonathan Overpeck

Director, Translational Environmental Research

### Barbara Morehouse

Deputy Director of Research, Translational Environmental Research

### Gregg Garfin

Deputy Director of Outreach, Translational Environmental Research

## LEARN MORE

- ◆ Contact Dr. Jonathan Overpeck, Director, Translational Environmental Research, at [jto@email.arizona.edu](mailto:jto@email.arizona.edu) or 520-622-9065
- ◆ Contact Dr. Barbara Morehouse, Deputy Director, Translational Environmental Research, at [morehoub@email.arizona.edu](mailto:morehoub@email.arizona.edu) or 520-622-9018
- ◆ Contact Dr. Gregg Garfin, Deputy Director of Outreach, Translational Environmental Research, at [gmgarfin@email.arizona.edu](mailto:gmgarfin@email.arizona.edu) or 520-622-9016
- ◆ Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513

## ADVISORY BOARDS

The initial UA Translational Environmental Research (TER) Faculty Advisory Committee is:

**David Adelman**, Professor, College of Law

**David Breshears**, Professor, School of Natural Resources

**Charles Hutchinson**, Professor and Director, Office of Arid Lands Studies

**John Paul Jones**, Professor and Head, Geography and Regional Development

**Jonathan Overpeck**, Professor and Director, Institute for the Study of Planet Earth

**Glenn Schrader**, Professor and Head, Chemical and Environmental Engineering

**James Shuttleworth**, Professor and Director, Sustainability of semi-Arid Hydrology and Riparian Areas (SAHRA)

The initial UA Translational Environmental Research (TER) External Advisory Committee is:

**Dr. Richard (Rick) Brusca**, Executive Program Director, Arizona-Sonora Desert Museum

**Patrick Cummins**, Program Director for Air Quality, The Western Governors' Association

**Diana M. Liverman**, Professor and Director, Environmental Change Institute, Oxford University Centre for the Environment

**David Modeer**, Director, Tucson Water

**Robert S. Webb**, Chief, Climate Analysis Branch, NOAA Earth System Research Laboratory



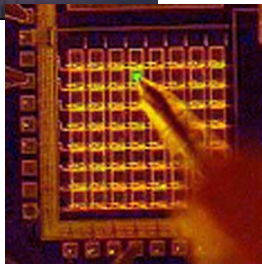
**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)**

**VENTURE FUND**

**THE UNIVERSITY OF ARIZONA.**

Arizona's First University.

September 1, 2007



In 2006, the Venture Fund was established to create a mechanism for supporting new projects with compelling strategic need or opportunity and exceptional opportunities for strong return-on-investment (ROI). Each new project must be related to the theme of an existing University of Arizona TRIF initiative and is administered through that initiative. Venture Funds are distributed annually on a competitive basis as a way of enhancing the scope of the individual initiatives in strategically selected areas.

The Venture Fund is overseen by the Provost and the Vice President for Research of the University.

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**GOALS**

The purpose of the Venture Fund is to ensure that the University becomes more nimble in addressing needs and increasing ROI in ways consonant with TRIF requirements and objectives.

The goals of the Fund are to:

- support the creation of novel projects, each of which is closely related to one of the existing TRIF initiatives
- bring these novel projects to successful competition for major external funding
- provide exceptional potential for translation of activities to practical application.



*Eugene G. Sander  
Executive Vice President  
and Provost*



*Leslie P. Tolbert  
Vice President for Research,  
Graduate Studies, and Economic  
Development*

## PROJECTS FUNDED IN FY 2007

The following new projects (and the initiatives with which they are associated) were selected for funding:

- Phasing out commitments to faculty previously supported by ACIST initiative; Budget – \$1,129,410
- Biodiversity Informatics Project (BIO5) – this work, building in part on ACIST accomplishments, will form a framework to solve key problems of integrating complex data sets that support biological research and medical care; Budget – \$636,150
- McKnight Brain Institute (Optical Sciences and Technology) – new optical imaging equipment will allow researchers to develop new methods for studying the neural basis for cognitive changes that occur during aging; Budget – \$350,500
- Arizona Center for Mathematics and Education (Workforce Initiative: Educator Development ) – this center will lead the nation in mobilizing high-level collaborations among mathematicians, scientists, and educators; Budget – \$50,000

## FINANCIAL INFORMATION

	Revised FY07 Budget	FY 08 Projected	FY09 Projected	FY10 Projected	FY11 Projected
Carry Forward	\$ 487,543	\$0	\$0	\$0	\$0
New TRIF Revenue	*\$3,250,729	\$3,018,484	\$4,007,741	\$5,051,406	\$6,152,474
<b>TOTAL REVENUE</b>	<b>\$3,738,272</b>	<b>\$3,018,484</b>	<b>\$4,007,741</b>	<b>\$5,051,406</b>	<b>\$6,152,474</b>
Personal Services	\$2,754,367	\$2,286,731	\$3,036,168	\$3,826,823	\$4,660,966
ERE	\$ 983,905	\$ 731,753	\$ 971,573	\$1,224,583	\$1,491,508
Operations	\$0	\$0	\$0	\$0	\$0
<b>TOTAL EXPENDITURES</b>	<b>\$3,738,272</b>	<b>\$3,018,484</b>	<b>\$4,007,741</b>	<b>\$5,051,406</b>	<b>\$6,152,474</b>

\*\$1,500,000 of FY06 over-realized was added to FY07 Venture Fund.

The measure of impact of Venture Fund investments is the same as for all other TRIF investments, and is incorporated into the impact metrics of the TRIF initiatives to which the Venture Fund allocations are made.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## LEARN MORE

• Contact Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies, and Economic Development, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513.

• Visit the University of Arizona TRIF website at [www.vpr.arizona.edu/trif](http://www.vpr.arizona.edu/trif).



TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)

# WATER SUSTAINABILITY

THE UNIVERSITY OF ARIZONA.

Arizona's First University.

September 1, 2007

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A sustainable, high-quality water supply is essential for economic development and enhanced quality of life in Arizona. Competing demands for water due to unprecedented population growth, emerging contaminants, high-tech industry needs, ecological concerns about habitat and species conservation, drought, and the uncertainties of climate change all contribute to the growing need for improved water science, new technologies, and the tools and policies for real-world application.



WSP researchers work to resolve water management issues in the Upper Santa Cruz River Basin

The Water Sustainability Program (WSP) is creating a collaborative environment to leverage the UA's recognized excellence in water expertise to enhance water research, education and outreach that will produce exportable knowledge and techniques that benefit Arizona and have global application. The focus of WSP is to enhance opportunities for students, build new education and research programs, and partner with industry to stimulate economic development.

WSP's vision is to be a world leader in interdisciplinary, cutting-edge water resources research and in applying results to resolve water resource challenges at the state, national, and international level.



WSP researchers are developing control methods for *Naegleria fowleri*, a potentially fatal amebic water contaminant



Dr. Sharon Megdal replaces Dr. Eugene Sander, appointed UA Provost, as WSP Director

# PERFORMANCE ANALYSIS

PERFORMANCE MEASURES		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Return on Investment (\$ in Millions)		Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual	Proj	Actual
Government Grants Received			0.24	0.28	0.45	0.26	0.50	0.26	0.50	0.26	0.26
Additional funding obtained	0.40	0.40	0.88	0.75	0.35	0.25	0.25	0.18	0.25	0.16	0.16
Water Center Leveraged Funds <sup>1</sup>	1.50	1.50	1.5	1.70	1.70	3.00	3.50	3.00	3.50	3.00	3.00
New Faculty Hired	1	1		1	1	1	5	4	5	4	4
<b>Technology Transfer &amp; Industry Collaborations</b>											
Patent applications in process					3	4	4	4	4	3	3
Workshops/seminars on tech transfer <sup>2</sup>										6	6
New collaborations				72	75	36	36	36	36		
Industry collaborators										100	115
										120	130
										140	140
<b>Workforce Contributions</b>											
Undergraduate employment/research opportunities	0	0	2	22	22	40	45	40	45	42	52
Graduate employment/research opportunities	1	1	4	37	54	75	85	89	85	85	68
Post graduate employment/research opportunities	2	2	1	2	3	3	4	3	4	4	8
<b>Curriculum Innovations/Education</b>											
Facilitators trained			40	40	40	41	41	58	41	40	36
Teachers trained			475	735	700	790	790	905	790	780	860
K-12 Students benefiting			26,500	26,340	26,000	29,230	29,000	33,480	29,000	25,000	30,565
#Water festivals held/# Schools/#Students participating				2/18/1700	5/27/2300	6/33/2920	6/56/4750	7/67/4790	6/56/4750		
Interdisciplinary curriculum modules developed			7	5	3	1					
Teachers trained/student contacts on modules			9/390	20/800	105/1490	201/2595	200/1500	34/1000	200/1500		
Teachers involved in outreach activities										130	234
K-12 students participating in outreach activities										4,500	5,617
New activities developed for K-12										2	2
Communities participating in K-12 outreach activities										6	7
New water related university courses/certificates/degrees										1	1
										1	1
<b>Other Knowledge Transfer</b>											
Water conferences/national meetings supported	1	1	1	1	1	1	1	2	1	2	2
New rural water centers	2	2	2	2	0	2	2	0	2	2	0
Communities assisted in water management										5	7
Publications produced										2	2
Other knowledge transfer products										2	2
Presentations										50	63
										50	50
										10	12
										3	3
										2	2
										4	4
										2	2
										50	50
										150	150
										4,800	4,900
										2	2
										8	9
										1	1
										1	1

<sup>1</sup> Water Center leveraged funds refers to external funding to the four coordinating Water Centers that was a match to TRIF funded activities. FY07-FY11 all matching funds are folded into the first 2 ROI metrics.

## PERFORMANCE ANALYSIS

**Return on Investment (ROI):** Over \$10M can be attributed to investment in WSP. The ROI is close to projected, with a somewhat lower return on industry match than expected. The four water centers attract considerable federal and industry dollars in addition to individual grants projects. Investment in 9 new faculty in FY07 in atmospheric science, chemical & environmental engineering, public health, law, policy and watershed management strengthen UA's ability to tackle complex state water problems and bring in new research funds.

**Technology Transfer & Industry Collaboration:** WSP researchers work to commercialize real world applications related to water quality treatment technology (3 in process). Workshops on emerging contaminants, drought and climate change, and irrigation technology extended UA research efforts to multiple audiences. Industry collaborators numbering over 100 provided direct dollars and considerable in-kind contributions of equipment, supplies, lab analysis and staff time to projects.

**Workforce Contributions** Opportunities for students are offered through research projects and fellowships. In FY07, undergraduate (52) and graduate (68) students, and post-docs (8) participated in WSP programs. There was a higher proportion of undergrads than in previous years.

**Curriculum Innovations/Education:** Over 35,00 K-12 students, and more than 800 teachers were impacted by high quality water education programs delivered through Arizona Project WET across the state. Sponsored water festivals were held in 7 Arizona communities. Curriculum on climate change was developed. A new university level water policy certificate for professionals was developed and approved for fall.

**Other Knowledge Transfer:** A conference on water & growth; water assessments for 7 communities; a new resource on Arizona water policy; Spanish translation of Arizona: Know Your Water; and expansion of Rainlog.org web features are a selection of WSP products and outreach.

## FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
<b>REVENUE</b>											
Carry Forward		\$442,080	\$95,320	\$437,798	\$595,950	\$689,983	\$689,983	\$1,138,641			
New TRIF Revenue	\$474,283	\$480,352	\$2,009,566	\$2,460,948	\$3,907,500	\$3,854,645	\$3,854,645	\$3,571,127	\$3,246,106	\$3,246,106	\$3,246,106
<b>TOTAL REVENUE</b>	<b>\$474,283</b>	<b>\$922,432</b>	<b>\$2,104,886</b>	<b>\$2,898,746</b>	<b>\$4,503,450</b>	<b>\$4,544,628</b>	<b>\$4,544,628</b>	<b>\$4,709,768</b>	<b>\$3,246,106</b>	<b>\$3,246,106</b>	<b>\$3,246,106</b>
<b>EXPENDITURES</b>											
Personal Services	\$28,757	\$502,244	\$1,135,364	\$1,585,695	\$1,917,386	\$3,743,019	\$2,406,712	\$4,179,768	\$2,791,106	\$2,791,106	\$2,791,106
All Other Operating	\$3,446	\$324,868	\$531,724	\$717,101	\$1,336,400	\$801,609	\$999,275	\$530,000	\$455,000	\$455,000	\$455,000
Capital	\$0	\$0	\$0	\$0	\$559,681	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL EXPENDITURES</b>	<b>\$32,203</b>	<b>\$827,112</b>	<b>\$1,667,088</b>	<b>\$2,302,796</b>	<b>\$3,813,467</b>	<b>\$4,544,628</b>	<b>\$3,405,987</b>	<b>\$4,709,768</b>	<b>\$3,246,106</b>	<b>\$3,246,106</b>	<b>\$3,246,106</b>
<b>Return on Investment</b>	-	2.2:1	1.2:1	1.5:1	.9:1	3.8:1	3.1:1	3.5:1	3:1	3:1	3:1

To match HB 2661 General Adjustments given to state-funded employees, \$46,106 from the Venture Fund was allocated to this initiative for its personnel.

This initiative received \$600,000 late in FY07 and \$325,021 in FY08 from the Venture Fund in support of new projects. FY07 Venture Funds were not expended.

Return on Investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by Arizona Board of Regents in March 2007, which is different from the ROI methodology used to calculate ROI in FY 2002-2006.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## GOALS

WSP's goal is to strengthen research, education, and outreach efforts in the water resources area at the University of Arizona to help ensure a sustainable, high-quality water supply for economic development and enhanced quality of life for all of Arizona. WSP will accomplish this goal by working to:

- ◆ Produce a high quality work force
- ◆ Develop and evaluate new water technologies

- ◆ Provide direction for the development of sound water policy

WSP is leveraging its strengths in academia, research, and environmental technology industries to create several outcomes that include: (a) practical education for grades K-12 to create general awareness of issues, problems, and career-related training; (b) internationally

*(Continued on page 4)*

## GOALS

(Continued from page #)



President Shelton presented awards to the winners of the Student Poster Competition at the WSP Fall Water Forum - "Tools & Technology for Water Sustainability."

innovations to create new business initiatives.

These efforts build on the extensive expertise among over 300 UA faculty and staff in 10 colleges and 60 departments and help to promote UA as a national and global leader in research and technology development.

WSP pursues these goals through a recruitment and research initiative; competitive grants program; student fellowship program; directed interdisciplinary initiatives;

recognized research and technology transfer initiatives; (c) a thriving industry cluster, which includes both private sector and public sector entities, supported by a skilled workforce that is educated at the University of Arizona; and (d) stronger relationships across disciplines within the University of Arizona, which will result in research



WSP Executive Committee L-R: Farhang Shadman, Ian Pepper, Sharon Megdal, and Jim Shuttleworth

## MANAGEMENT

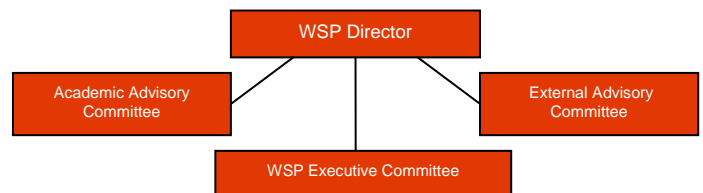
WSP Director, Sharon Megdal, reports to Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development. Reporting to the Director is the WSP Executive Committee, comprised of the directors of the four coordinating water centers: Sharon Megdal, Water Resources Research Center; Ian Pepper, NSF Water Quality Center; Farhang Shadman, SRC/Sematech Engineering Research Center for Environmentally Benign Semiconductor Manufacturing; and Jim Shuttleworth, NSF Center for Sustainability of semi-Arid Hydrology and Riparian Areas.

## ADVISORY COMMITTEES

Two advisory committees provide guidance:

**Academic Advisory Committee:** Colin Kaltenbach, Agriculture and Life Sciences □ Beth Mitchneck, Social and Behavioral Sciences □ Toni Massaro, Law □ Tom Peterson, Engineering □ Joaquin Ruiz, Science □ Iman Hakim, Public Health.

**External Advisory Committee:** Amy Belger, Environmental Health and Safety Manager, Freescale Semiconductor □ Thomas Buschatzke, Water Advisor, City of Phoenix □ Joan Card, Water Quality Division Director, Arizona Department of Environmental Quality □ Prabhu Dayal, CEO, C Trade, Chair, Environmental Technology Industry Cluster □ Vladimir Drobny, Development Manager, Texas



Instruments □ Carol Erwin, Area Manager, Bureau of Reclamation □ John Hoffman, Director, Arizona Water Science Center, USGS □ David Modeer, Director, Tucson Water □ Errol Montgomery, Hydrologist, Errol L. Montgomery & Associates □ Karen Smith, Deputy Director, Arizona Department of Water Resources □ John Sullivan, Associate General Manager, Salt River Project □ Dick Walden, Chairman, Farmers Investment Company □ Sid Wilson Jr., General Manager, Central Arizona Project.

## LEARN MORE

- ◆ Contact Dr. Sharon Megdal, WSP Director, at [smegdal@cals.arizona.edu](mailto:smegdal@cals.arizona.edu) or 520-792-9591 X21.
- ◆ Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, at [tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu) or 520-621-3513.
- ◆ Visit the WSP website at [www.uawater.arizona.edu](http://www.uawater.arizona.edu) for program details and visit the WSP [ArizonaWater.org](http://ArizonaWater.org) website, your first stop for state water information.



TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)

# WORKFORCE INITIATIVE THE EDUCATOR DEVELOPMENT PLAN

THE UNIVERSITY OF ARIZONA.

Arizona's First University.

## WORK FORCE INITIATIVE The Educator Development Plan

September 1, 2007

Without continued workforce development programs, the economic development of Arizona will depend primarily on out-of-state resources.



Arizona's children must receive quality instruction in math and science

The Workforce Initiative: The Educator Development Plan addresses critical workforce shortages in Arizona for math, science, and agricultural science educators through recruiting, preparing, and retaining teachers. This interdisciplinary initiative is a collaboration among faculty in the Colleges of Education, Science, and Agriculture and Life Sciences.

To support a technologically advanced economy in Arizona, Arizona's children must receive quality instruction in math and science. One of the most



critical elements of student success in school is quality teaching. These teachers motivate and prepare students to pursue careers in math, science, and agricultural science, which ultimately increases economic development potential.

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Dr. Ronald W. Marx  
Dean, College of Education

## PERFORMANCE ANALYSIS

PERFORMANCE MEASURES	FY02 Proj	FY02 Act	FY03 Proj	FY03 Act	FY 04 Proj	FY0 4 Act	FY05 Proj	FY05 Act	FY06 Proj	FY06 Act	FY07 Proj	FY07 Act	FY08 Proj	FY09 Proj	FY10 Proj	FY11 Proj
<b>Return on Investment</b>																
Grants*						-	-	\$2.2M	-	\$3.0 M	N/A	N/A	N/A	N/A	N/A	N/A
Gifts						\$25 K	-	\$25 K	-	\$115 K	N/A	N/A	N/A	N/A	N/A	N/A
<b>Teachers Certified</b>																
Secondary Math & Science	11	7	10	12	15	22	25	20	30	24	40	24	40	45	45	45
Master's Level Secondary Math & Science	30	28	30	25	30	26	30	40	30	24	30	24	30	30	30	30
Agriculture	5	8	5	13	10	16	10	16	10	12	15	11	17	19	20	20
K-12 Students Impacted**	2,300	2,150	2,250	2,500	2,750	3,200	3,250	3,800	3,500	3,000	4,250	2,950	8,600	13,300	18,050	22,000

\* Based on federal grants received during Phase I and change in criteria for ROI calculation during Phase II

\*\* Assumes 50 students per certified teacher

- During Phase I, return on investment was measured by the dollars received from grants and gifts divided by total expenditures. These funds were primarily from federal grants used to support training of mathematics, science, and agriculture teachers. During Phase II, nonresearch initiatives were not expected to report return on investment based on grants and gifts.
- The Educator Development Plan will prepare teachers for mathematics, sciences, and agriculture science certification for K-12 schools. These teachers will be employed in schools throughout Arizona. We exceeded our targets for producing certified teachers in our first 5 years and have built the infrastructure to sustain this program in the next phase. Thus the estimates of numbers of teachers produced increase only very modestly.
- The graduates of the teacher preparation programs funded by this project will impact K-12 students directly. We estimate each teacher will impact 50 students annually. This is a conservative estimate—some teachers will have more students, other will have less or will leave teaching. Our estimates are cumulative, because most teachers will stay in teaching, thus each year we add more teachers and impact increasingly more students.

## FINANCIAL INFORMATION

REVENUE	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Revised Budget	FY07 Actual	FY08 Revised Budget	FY09 Budget	FY10 Budget	FY11 Budget
Carry Forward	-	\$138,457	\$261,542	\$189,172	\$128,370	\$228,603	\$228,603	\$143,879	-	-	-
New TRIF Revenue	\$775,705	\$769,523	\$808,320	\$801,574	\$961,846	\$863,817	\$863,817	\$863,817	\$813,817	\$813,817	\$813,817
<b>TOTAL REVENUE</b>	<b>\$775,705</b>	<b>\$907,980</b>	<b>\$1,069,862</b>	<b>\$990,746</b>	<b>\$1,090,216</b>	<b>\$1,092,420</b>	<b>\$1,092,420</b>	<b>\$1,007,696</b>	<b>\$813,817</b>	<b>\$813,817</b>	<b>\$813,817</b>
<b>EXPENDITURES</b>											
Personal Services	\$324,008	\$318,915	\$473,467	\$487,354	\$407,080	\$798,325	\$579,239	\$743,355	\$549,476	\$549,476	\$549,476
All Other Operating Expenses	\$313,240	\$327,523	\$402,734	\$375,022	\$335,733	\$294,095	\$369,302	\$264,341	\$264,341	\$264,341	\$264,341
Capital	-	-	-	-	\$118,800	-	-	-	-	-	-
<b>TOTAL EXPENDITURES</b>	<b>\$637,248</b>	<b>\$646,438</b>	<b>\$876,201</b>	<b>\$862,376</b>	<b>\$861,613</b>	<b>\$1,092,420</b>	<b>\$948,541</b>	<b>\$1,007,696</b>	<b>\$813,817</b>	<b>\$813,817</b>	<b>\$813,817</b>

Return on Investment (ROI) for FY 2002—2006 was calculated by adding grants and gifts divided by expenditures.

As a nonresearch initiative and pursuant to the new March 2007 ROI policy, ROI will not be calculated in FY 2007-2011.

To match HB 2661 General Adjustments given to state-funded employees, \$13,817 from the Venture Fund was allocated to this initiative for its personnel.

This initiative received \$50,000 in FY 07 and \$50,000 in FY 08 from the Venture Fund in support of new projects.

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.



## GOALS

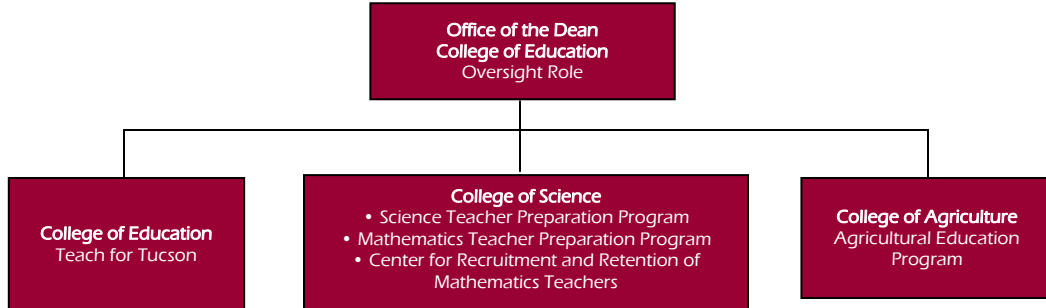
The primary goals of the Workforce Initiative are:

- Create a seamless progression in math and science from elementary through secondary school.
- Build incentives and support for students to enter math, science, and agricultural science teacher preparation programs.
- Establish incentives and support for math, science, and agricultural science teachers to stay in teaching locally.
- Mature programs that will accomplish quantitative goals of graduating 456 math, science, and agricultural science teachers.



## MANAGEMENT

Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development is responsible for overall management of the University’s TRIF activities. The organizational management structure for the Workforce Initiative consists of leadership from the three colleges under which these programs are developed and executed, overseen by Dr. Ron Marx, Dean of the College of Education. Additionally, a multi-college management committee will oversee the implementation of the plan to ensure that the goals are met.



- Office of the Dean of the College of Education: Ron Marx, Dean
- College of Education: Teach for Tucson: Bob Hendricks, Associate Dean
- College of Science: Gail Burd, Associate Dean
  - Science Teacher Prep: Ingrid Novodvorsky, Assistant Professor of Physics
  - Math Teacher Prep: Virginia Horak, Associate Professor of Mathematics
  - Center for Recruitment: Fred Stevenson, Professor of Mathematics
- College of Agriculture and Life Sciences: Dave Cox, Associate Dean
  - Agriculture Education: Jack Elliot, Professor of Agriculture Education

## ADVISORY BOARD



Through the auspices of the College of Education, the Professional Preparation Board (PPB) serves as a P-12 and community college liaison organization. Members include administrators (e.g., superintendents or associate superintendents)

from all Tucson area schools, representatives from each CoE department, representatives from all UA colleges engaged in and related to teacher preparation, and Pima College administrators. The executive director of the PPB is Carolyn Dumler, Assistant Superintendent of the

Marana School District. The PPB meets monthly through the academic year and ensures a close working relationship among all represented parties to improve teacher education and develop collaborations among member organizations to advance P-12 effectiveness. A subcommittee from the PPB serves in advisory capacity to the Workforce Initiative:

- Jeannie Favela, Director of Bilingual Education, Sunnyside School District
- Thomas Drexel, Director, Presidio Charter Schools
- Debbie D’ Amore, Chief Deputy, Office of the Pima County Superintendent
- Carolyn Dumler, Assistant Superintendent, Marana School District

## LEARN MORE

- ◆ Contact Dr. Ronald W. Marx, Dean, The University of Arizona College of Education, at ronmarx@email.arizona.edu or 520-621-1081.
- ◆ Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, The University of Arizona, at Tolbert@email.arizona.edu or 520-621-3513.
- ◆ Visit the College of Education at [www.coe.arizona.edu](http://www.coe.arizona.edu) and read the complete business plan for the Workforce Initiative: The Educator Development Plan.



**THE UNIVERSITY OF ARIZONA**  
**FY 2007-2011 ASU-UA Joint Biomedical Research Fund**

**September 1, 2007**

The University of Arizona and Arizona State University jointly administer the TRIF-funded *Collaborative on Biomedical Research Grant Program*, with awards totaling \$2,000,000 (\$1,000,000 each) in FY 2007 and \$1,000,000 (\$500,000 each) per year in FY 2008-FY 2011.

These projects are collaborative in nature and may also include other biomedically oriented organizations such as the Translational Genomics Research Institute (T-Gen), the Critical Path Institute (C-Path), the many health-related institutions in the state, and Northern Arizona University. This investment will accelerate development of the research enterprise associated with the Phoenix Track of the UA College of Medicine and the state-wide development of biomedical research. The funds are targeted to support joint research ventures among the institutions, and translating from basic to clinical research.

The main objectives of the program are to provide seed funding to:

1. Support the development and strengthening of collaborative research ties between ASU and UA as a basis for enhancement of state-wide interaction among research institutions; and
2. Support the development and submission of proposals for external funding of research from competitive granting agencies (e.g., NSF, NIH, DOE, etc.) and industry.

To administer these funds, ASU and UA have established a coordinating committee to set the scientific and technical criteria for selection and to make the awards. The coordinating committee includes the Presidents and Vice Presidents for Research from ASU and UA. Review of proposals includes input from faculty at these universities and, when deemed useful, also will be from prominent biomedical scientists from outside the university system. While some projects in the first year were selected specifically to enhance collaborative ties between ASU's Biodesign Institute and UA's BIO5 Institute, as a general practice, projects are solicited through a broad Request for Proposals, and are selected according to the following criteria:

- Scientific excellence
- Collaboration of faculty members from more than one institution as principal investigators
- Likelihood of success in securing long-term, significant federal or other (e.g., Science Foundation Arizona) funding
- Clear demonstration of the value-added significance of the inter-institutional collaboration required
- Potential for significant impact on our understanding of basic biomedical mechanisms or translation of research results to the clinical setting
- Potential for impact on overall State-wide strength in the biomedical sciences.

Thus far the program has awarded \$1,999,977 in FY 2007 and \$1,000,000 in FY 2008 for the following projects:

<b>Title</b>	<b>FY 2007</b>	<b>FY 2008</b>
Proteomic and Metabolomic Biomarker Investigation of Type 2 Diabetes	\$250,000	
Geno- and Immuno-Signatures in Acute Asthma	\$297,977	
Development of a Rapid Immunosignature Diagnostic Test for Valley Fever	\$320,000	
Molecular Therapeutics Collaborative Program between BIO5 and Biodesign Institutes	\$325,000	
Rapid Biomarker Analysis for Emergency Medicine	\$157,141	\$196,682
A Network-Science Approach to Normal- Tissue Organization and Carcinogenesis	\$141,562	\$180,468
A Digital Media Based Biofeedback System for Neural Rehabilitation	\$147,309	\$184,057
Evaluating the Role of VDR Polymorphisms and B-Catenin Signaling in Colorectal Adenoma Risk	\$65,414	\$81,642
Selective Modulation of Basal Ganglia Excitability: A Potential Gene Therapy for Parkinson's Disease	\$151,685	\$178,441
Novel Superluminescent LEDs and Ultrahigh-resolution for OCT for Medical Imaging Applications	\$143,889	\$178,710
<b>TOTAL AWARDS</b>	<b>\$1,999,977</b>	<b>\$1,000,000</b>

**CONTACT:** Rick Shangraw 480-965-1225  
 Vice President for Research and Economic Affairs  
[Rick.Shangraw@asu.edu](mailto:Rick.Shangraw@asu.edu)

Leslie P. Tolbert 520-621-3513  
 Vice President for Research, Graduate Studies,  
 and Economic Development  
[tolbert@email.arizona.edu](mailto:tolbert@email.arizona.edu)

**THE UNIVERSITY OF ARIZONA**  
**Expansion of the Phoenix Biomedical Campus**

**September 1, 2007**

1. UA COM-Phoenix Lease (partial) - \$1,140,000/yr for 5 years:

Costs associated with the lease of the renovated Phoenix Union High School for the UA College of Medicine-Phoenix were budgeted at \$1,140,000 per year. The lease payments are being expensed through The University of Arizona Real Estate Administration and the Financial Services Office.

2. UA COM-Phoenix Operating, Maintenance, and Utility costs - \$833,000/yr for 5 years:

Annual operating, maintenance, and utility costs of \$833,000 were allocated for the UA College of Medicine-Phoenix. Operations, maintenance, and utility costs are being expensed through The University of Arizona Facilities Management department.

3. Pharmacy Matching - \$100,000 (for each of 3 years):

Funds in the amount of \$100,000 were allocated for each of three years to match proposed allocations of \$200,000 annually for three years by the Arizona Pharmacy Board. The purpose was to fund planning costs for the College of Pharmacy in Phoenix. The College of Pharmacy has hired an experienced pharmacist to serve as the outreach coordinator to work with the experiential program in Phoenix. The outreach coordinator will also develop and coordinate new sites throughout the Phoenix valley to expand clinical opportunities for students. In addition, plans have been finalized with the SmithGroup for the College of Pharmacy to utilize 2,500 square feet in the TGen building. The College of Pharmacy expects to move into that space in the summer of 2007.

4. UA COM-Phoenix Internet Connection - \$72,000:

An allocation of \$72,000 was provided as a one-time expense to provide internet connectivity for the UA COM-Phoenix complex. Funds are being expended through the Computing and Information Technology Center (CCIT) to lease communications services to connect the UA COM-Phoenix to the UA Tucson via the Sterling Telecom Hotel.

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## **PLANNING FOR PHOENIX BIOMEDICAL CAMPUS (PBC)**

Status Report on Steering Committee Activities Related to the Medical Education Building (MEB), Arizona Biomedical Collaborative II (ABC II), and the Phoenix Biomedical Campus Comprehensive Development Plan

September 1, 2007

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### **1. Committee Activities:**

The Phoenix Biomedical Campus (PBC) Steering Committee is composed of representatives from The University of Arizona, Arizona State University, Northern Arizona University, the Arizona Board of Regents, the City of Phoenix, and other stakeholders. Since October of 2006, the Committee has met on a regular basis. The following is a chronological list of events and activities related to the Steering Committee's efforts:

- In March 2007, welcomed Dr. Edward H. (Ted) Shortliffe as Dean of The University of Arizona College of Medicine-Phoenix, in Partnership with Arizona State University on the Phoenix Biomedical Campus. Dean Shortliffe has been actively involved in the planning process; for example, joining biomedical campus field investigations at the University of Pennsylvania Medical Center in Philadelphia.
- Retained the services of the SmithGroup (facilities programming), Rider Levett Bucknall (cost estimating), and Ayers Saint Gross (ASG) (campus master planning). These procurements were expedited through The University of Arizona's open-end contracting process. As such, the UA is serving as the contracting agent for purposes of billings, invoices, etc.
- Using the combined services of the SmithGroup and Rider Levett, completed the final programming and initial cost estimating for the Medical Education Building (MEB) and Arizona Biomedical Collaborative II (ABC II) in May 2007. Approximately 710,000 square feet of needed facilities were identified, with a preliminary total cost in excess of \$470 million.
- Also in May 2007, completed a Conceptual Ten Year Facilities Plan for the Biomedical Campus. The Plan examines the demand for facilities to accommodate projected enrollment and staffing, and concludes that additional research space will be needed in the ten-year planning horizon.

- In July 2007, issued a Request for Qualifications for professional design services on both MEB and ABC II. Statements of Qualifications were received on July 30, 2007, and will be evaluated by a selection team representing the Steering Committee. It is projected that teams will be selected by late August 2007 and that contracts can be negotiated by early October 2007.
- Commenced the Campus Comprehensive Development Plan for the 28-acre Phoenix Biomedical Campus. Initial activities included benchmarking other academic health science center campuses and reviewing long-term program facility requirements. Subsequently, Steering Committee representatives and key officials have visited and are continuing to visit selected campuses and medical centers throughout the United States (e.g., Johns Hopkins). The Committee has also met with various utility groups and other key stakeholders, and is now preparing alternative campus development strategies with the support of their planning consultants.

## **2. Proposed Schedule:**

- August 2007: Complete site visits in August 2007, and finalize alternative campus development concepts. Initiate public review process.
- September 2007-mid-October 2007: Select preferred campus plan, finalize design guidelines and other scope elements (utilities, parking, circulation, etc.). Forward to Arizona Board of Regents and the City of Phoenix Mayor and Council for consideration and possible adoption.

## **3. Issues to be Resolved:**

- Role of private sector in developing the PBC campus.
- Funding or financing of parking structure and other components of the PBC campus infrastructure (e.g., open space, utilities, etc.).

## **4. Use of \$1.5 Million in ABOR Planning Funds:**

ASU and UA were each allocated \$750,000 in TRIF planning funds by the Arizona Board of Regents for this purpose. To date, \$344,300 has been spent with an additional \$220,000 encumbered for programming, cost estimating, and planning of MEB, ABC II, and related support facilities for the long-term development of the 28-acre PBC. The balance of these funds will be utilized in the design of the MEB and ABC II projects, augmenting the \$10.5 million already allocated for design phase activities.

**ABOR CENTRAL OFFICE  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 ACTUAL / FY 2008 - 2011 BUDGETS  
SUMMARY**

	<b>FY 2007 REVISED BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 REVISED BUDGET</b>	<b>FY 2009 BUDGET</b>	<b>FY 2010 BUDGET</b>	<b>FY 2011 BUDGET</b>
<b>REVENUE</b>						
Carryforward	\$ 1,277,429	\$ 1,277,429	\$ 4,287,660	\$ -	\$ -	\$ -
TRIF Revenue	4,916,164	4,916,171	4,175,000	4,253,750	4,336,438	4,423,260
<b>TOTAL REVENUE</b>	<b>\$ 6,193,593</b>	<b>\$ 6,193,600</b>	<b>\$ 8,462,660</b>	<b>\$ 4,253,750</b>	<b>\$ 4,336,438</b>	<b>\$ 4,423,260</b>
<b>EXPENDITURES</b>						
<b>OPERATING BUDGET</b>						
Personal Services	\$ 98,810	\$ 154,893	\$ 149,437	\$ -	\$ -	\$ -
ERE	21,597	42,970	39,757	-	-	-
All Other Operating	364,065	63,849	180,806	-	-	-
<b>TOTAL OPERATING BUDGET</b>	<b>484,472</b>	<b>261,712</b>	<b>370,000</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>GRANTS/PROJECTS</b>						
Regents Innovation Fund	2,012,518	1,119,236	2,424,286	1,653,750	1,736,438	1,823,260
Arizona Regents Reach Out (ARRO) Grants	762,554	443,404	819,150	600,000	600,000	600,000
TRIF Strategic Investments (TSI)	2,934,048	250,000	4,849,224	2,000,000	2,000,000	2,000,000
<b>TOTAL GRANTS/PROJECTS</b>	<b>5,709,120</b>	<b>1,812,640</b>	<b>8,092,660</b>	<b>4,253,750</b>	<b>4,336,438</b>	<b>4,423,260</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 6,193,592</b>	<b>\$ 2,074,352</b>	<b>\$ 8,462,660</b>	<b>\$ 4,253,750</b>	<b>\$ 4,336,438</b>	<b>\$ 4,423,260</b>
<b>SUMMARY BY INITIATIVE</b>						
Regents Innovation Fund	\$ 2,386,125	\$ 1,265,329	\$ 2,694,286	\$ 1,653,750	\$ 1,736,438	\$ 1,823,260
Arizona Regents Reach Out (ARRO) Grants	873,419	559,023	919,150	600,000	600,000	600,000
TRIF Strategic Investments (TSI)	2,934,048	250,000	4,849,224	2,000,000	2,000,000	2,000,000
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 6,193,592</b>	<b>\$ 2,074,352</b>	<b>\$ 8,462,660</b>	<b>\$ 4,253,750</b>	<b>\$ 4,336,438</b>	<b>\$ 4,423,260</b>

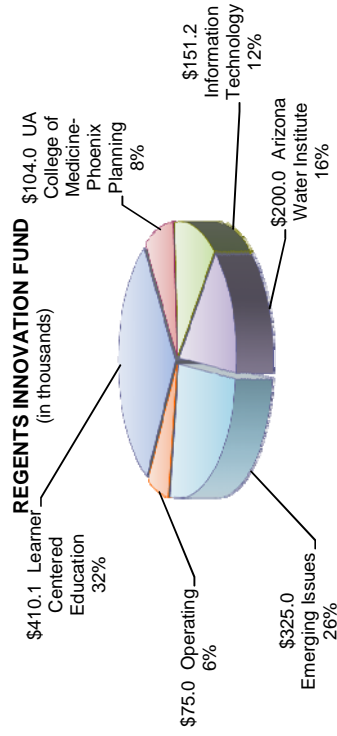
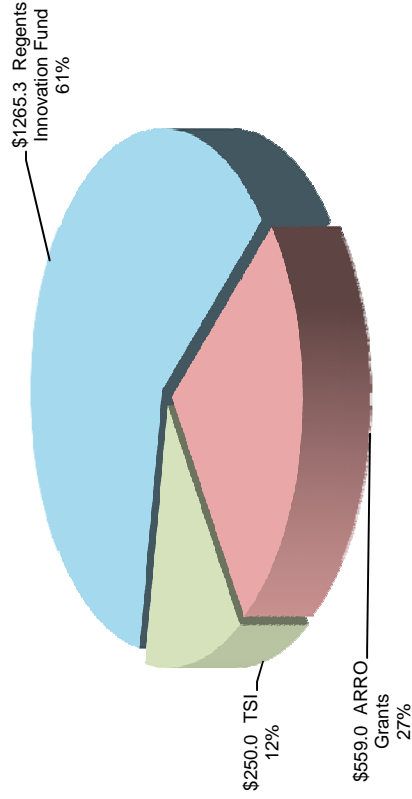
**ABOR CENTRAL OFFICE  
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)  
FY 2007 BUDGET / ACTUAL  
SUMMARY BY PROGRAM AREA**

	FY 2007 REV BUDGET	FY 2007 ACTUAL
<b>REVENUE</b>		
Carryforward	\$ 1,277,429	\$ 1,277,429
TRIF Revenue	4,916,164	4,916,171
<b>TOTAL REVENUE</b>	<b>\$ 6,193,593</b>	<b>\$ 6,193,600</b>

<b>EXPENDITURES</b>		
<b>OPERATING BUDGET</b>		
Personal Services	\$ 98,810	\$ 154,893
ERE	21,597	42,970
All Other Operating	364,065	63,849
<b>TOTAL OPERATING BUDGET</b>	<b>484,472</b>	<b>261,712</b>
<b>GRANTS/PROJECTS</b>		
Regents Innovation Fund	2,012,518	1,119,236
Arizona Regents Reach Out (ARRO) Grants	762,554	443,404
TRIF Strategic Investments (TSI)	2,934,048	250,000
<b>TOTAL GRANTS/PROJECTS</b>	<b>5,709,120</b>	<b>1,812,640</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 6,193,592</b>	<b>\$ 2,074,352</b>

<b>SUMMARY BY INITIATIVE</b>		
Regents Innovation Fund:		
Learner Centered Education	\$ 828,156	\$ 410,128
UA College of Medicine-Phoenix Planning	250,000	104,000
Information Technology	180,000	151,221
Arizona Water Institute	200,000	200,000
Operating	73,465	74,980
Emerging Issues	854,505	325,000
Total Regents Innovation Fund	2,386,126	1,265,329
Arizona Regents Reach Out (ARRO) Grants	873,419	559,023
TRIF Strategic Investments (TSI)	2,934,048	250,000
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 6,193,593</b>	<b>\$ 2,074,352</b>

**FY 2007 CENTRAL OFFICE ACTUAL TRIF EXPENDITURES  
(in thousands)**



**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND  
**Regents Innovation Fund Summary**

	<b>FY 2007 REV BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 BUDGET</b>
<b>REVENUE</b>			
Carry Forward	\$ 886,126	\$ 886,126	\$ 1,119,286
TRIF Revenue	1,500,000	1,500,000	1,575,000
<b>TOTAL REVENUE</b>	<b>\$ 2,386,126</b>	<b>\$ 2,386,126</b>	<b>\$ 2,694,286</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ 62,526	\$ 65,618	\$ 79,939
ERE	11,816	17,251	22,383
All Other Operating	299,265	63,224	167,678
Subtotal Operating Budget	<b>373,607</b>	<b>146,093</b>	<b>270,000</b>
<b>GRANTS/PROJECTS:</b>			
Learner-Centered Education	539,013	339,360	700,000
The University of Arizona College of Medicine-Phoenix Planning	250,000	104,000	250,000
Information Technology Collaborative	169,000	150,876	250,000
Arizona Water Institute (AWI)	200,000	200,000	200,000
Emerging Issues	854,505	325,000	899,286
Statewide Transfer Articulation System	-	-	125,000
Subtotal Grants/Projects	<b>2,012,518</b>	<b>1,119,236</b>	<b>2,424,286</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 2,386,125</b>	<b>\$ 1,265,329</b>	<b>\$ 2,694,286</b>
<b>SUMMARY BY INITIATIVE</b>			
Learner-Centered Education	\$ 828,156	\$ 410,128	\$ 860,000
The University of Arizona College of Medicine-Phoenix Planning	250,000	104,000	250,000
Information Technology Collaborative	180,000	151,221	250,000
Arizona Water Institute (AWI)	200,000	200,000	200,000
Operating	73,465	74,980	110,000
Emerging Issues	854,505	325,000	899,286
Statewide Transfer Articulation System	-	-	125,000
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 2,386,126</b>	<b>\$ 1,265,329</b>	<b>\$ 2,694,286</b>

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**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND  
 Arizona Water Institute (AWI)

	<b>FY 2007 REV BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 BUDGET</b>
<b>REVENUE</b>			
Carry Forward	\$ -	\$ -	\$ -
TRIF Revenue	200,000	200,000	200,000
<b>TOTAL REVENUE</b>	<b>\$ 200,000</b>	<b>\$ 200,000</b>	<b>\$ 200,000</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ -	\$ -	\$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
<b>GRANTS/PROJECTS:</b>			
The University of Arizona	200,000	200,000	200,000
Subtotal Grants/Projects	<b>200,000</b>	<b>200,000</b>	<b>200,000</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 200,000</b>	<b>\$ 200,000</b>	<b>\$ 200,000</b>

**ARIZONA WATER INSTITUTE (AWI)  
 FY 2007 ACTUAL / FY 2008 BUDGET**

	<b>FY 2005 Actual (*)</b>	<b>FY 2006 Actual (**)</b>	<b>FY 2007 Budget</b>	<b>FY 2007 Actual</b>	<b>FY 2008 Budget</b>
<b>REVENUE</b>					
Carry Forward	\$ -	\$ -	\$ 58,000	\$ 58,000	\$ 48,490
NEW TRIF Revenue	\$ 37,500	\$ 150,000	\$ 200,000	\$ 200,000	\$ 200,000
<b>Total Revenue</b>	<b>\$ 37,500</b>	<b>\$ 150,000</b>	<b>\$ 258,000</b>	<b>\$ 258,000</b>	<b>\$ 248,490</b>
<b>EXPENDITURES</b>					
Personnel Services	\$ -	\$ 84,200	\$ 185,000	\$ 192,310	\$ 210,600
Other Operating	\$ 37,500	\$ 7,800	\$ 15,000	\$ 17,200	\$ 20,000
<b>Total Expenditures</b>	<b>\$ 37,500</b>	<b>\$ 92,000</b>	<b>\$ 200,000</b>	<b>\$ 209,510</b>	<b>\$ 230,600</b>

\* FY 2005 TRIF funds were allocated to Arizona Department of Commerce (not to AWI) to fund development of AWI business plan by Battelle Institute.

\*\* FY 2006 personnel expenditures were below funding request due to timing of hiring of Executive Director and Administrative Associate.



## Background

Arizona's three state universities — Arizona State University, Northern Arizona University, and The University of Arizona — have formed a partnership that will position the state as a world leader in water resources management and technology. The primary driver for this initiative is sustaining Arizona's water supply, which is crucial to the state's economy, the health and well-being of its residents, and its natural environment.



Arizona is known worldwide for its innovative water management activities. Although the water issues facing the state are daunting, the state's commitment to long-term water supply availability has resulted in billions of dollars in investment for renewable supplies, innovative regulatory programs, and development of significant institutional capacity.

The Arizona Water Institute (AWI) combines the expertise of Arizona's water managers with the resources of the three universities to support water resources management and technology development in real-world applications. This unique partnership — which also includes three state agencies, Water Resources (ADWR), Environmental Quality (ADEQ), and Commerce (ADoC) — was formed to provide access to hydrologic information, support communities, and develop technologies to promote water sustainability. AWI founding partners also include Intel Corporation and the Salt River Project.

AWI: Water sustainability through collaborative partnerships among Arizona's three universities, agencies, the private sector and communities

## Mission & Structure

### Arizona Water Institute's Mission

- AWI serves as a hub of research, community assistance, and analytical support to ensure clean and sustainable water resources;
- AWI provides education, training, and professional capacity building to citizens and state, local, and tribal government decision makers about conserving and managing water in arid/semi-arid environments;
- AWI serves as a driver of economic opportunity by developing water products and services.

### AWI Structure

The Executive Committee provides direction and oversight of AWI activities. It is comprised of:

- the Vice-Presidents for Research at the three universities;
- the Chief of Staff of the governor's office;
- the chair of a 38-member external advisory committee made up of diverse water interests; and
- the Director of ADWR (a rotating position among the three agencies).

The Executive Director reports to the committee. Faculty coordinators on each campus help match resources within the three institutions to AWI projects and ensure the timely completion of projects. Associate Directors located in ADWR, ADEQ, and ADoC ensure that AWI provides the agencies with timely and appropriate support by working on projects and providing technical assistance.

## Collaborative Research

AWI initiatives focus on broad areas of interest critical to governments, industries, and communities:

- Web-based access to water information through the Arizona Hydrologic Information System;
- Capacity building/watershed research and support;
- Climate change, drought, and adaptation;
- Emerging contaminants and treatment technologies;
- Salinity management and technologies; and
- Water and energy strategic research.



## Services

AWI provides services to stakeholders, industry, agencies, and communities:

- Water-related data access and retrieval;
- Projects focused on real world solutions;
- Presentations for groups and events;
- Planning support and meeting facilitation for water-related applications;
- Workshops and research proposal development; and
- Technology development and commercialization.

Collaborative teams of university researchers and stakeholders in government, industry, tribes, water companies, watershed alliances, agriculture, and other organizations work to solve the critical water issues facing Arizona and other semi-arid and arid environments.

## Accomplishments

In its first year, AWI funded 18 collaborative projects. A key focus is its Arizona Hydrologic Information System (AHIS). Working with partners such as ADWR, ADEQ, and the Salt River Project, AWI is developing the tools to store, access, retrieve, and analyze water information to support water-related decisions, research, planning, education, and outreach. Projects in four other focus areas include:

Water quality/treatment

- Testing of electrocoagulation technology in semiconductor manufacturing
- Analysis of emerging contaminants in water
- Removal of estrogenic compounds at wastewater treatment plants
- Development of a sensor for disinfection byproducts in drinking water
- Development of a drought indicator and trigger for community water systems
- Increasing water recovery during reverse osmosis treatment of CAP water
- Evaluation of irrigation controller technologies

Tribal support

- Assessment of the Navajo Nation's hydroclimate network
- Development of plans with Intertribal Council of Arizona for tribal water management in Arizona Watershed Assistance and Facilitation

- Scenario development and visualization for East Valley Water Forum drought planning
- Review of ADWR Management Plan effectiveness
- Assessment of environmental flow requirements of the Verde River
- Development of integrated riparian area monitoring
- Identification/characterization of heritage waters

Water/energy sustainability



Arizona Wells Interface with AHIS  
www.sahra.arizona.edu/wells/

Photo of Roosevelt Dam: Salt River Project

## Innovation

### Building a Community

AWI is about people – people building collaborative, multidisciplinary solutions to water management challenges. One of AWI's most significant contributions is facilitating collaborations involving citizens, water managers, agencies, and policy makers and Arizona's universities. It is only through such collaborations to build community that the complexities of the natural, economic, political, and social factors that influence water management can be successfully integrated into sustainable water management decisions.

### Future of AWI

AWI is currently supported by the Arizona Board of Regents and the state general fund through an appropriation to the three universities. The universities also provide financial and operational support through other funding sources. AWI plans to be largely self-sustaining through federal grants, foundation support, project-related income, and private donations.

## Partnership Opportunities

### Multiple ways to partner with AWI

- **Sign up for our newsletter:** Contact [thaymore@azwaterinstitute.org](mailto:thaymore@azwaterinstitute.org).
- **Become a Member:** Individuals and organizations can join AWI to support our efforts to resolve Arizona water issues and to develop international water sustainability solutions. We have non-profit tax status so that any gifts are tax deductible.
- **Become an AWI Faculty Affiliate:** Faculty affiliates are faculty and staff members who are engaged in AWI research projects or are willing to help with new projects on a time-available basis.
- **Become a Partner:** AWI serves as an information broker, connecting water quality and water supply issues with appropriate solutions. We can help to find funding for projects as well as work collaboratively to develop research teams and proposals. Our partnerships can be built around individual projects or longer-term programs.

### Initial Partners and Members

- APS Electric Company
- Arizona Department of Health Services
- Arizona Geological Survey
- Central Arizona Project
- City of Flagstaff
- City of Phoenix
- City of Tucson
- East Valley Water Forum
- Freeport-McMoran Copper & Gold, Inc.
- Global Water
- Intel Corporation
- Intertribal Council of Arizona, Inc.
- Metro Water District
- Museum of Northern Arizona
- Navajo Nation
- Pima County
- Salt River Project
- Sonoran Institute
- Sustainable Tucson
- The Nature Conservancy
- Tucson Electric Power Company/Unisource
- U.S. Fish and Wildlife Service
- Verde River Partnership

## Contact Information

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 Phone: 520-626-5627  
 Fax: 520-626-7770  
 E-mail: [thaymore@azwaterinstitute.org](mailto:thaymore@azwaterinstitute.org)  
[www.azwaterinstitute.org](http://www.azwaterinstitute.org)

### Campus Coordinators

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### Associate Directors



Arizona Department of Environmental Quality

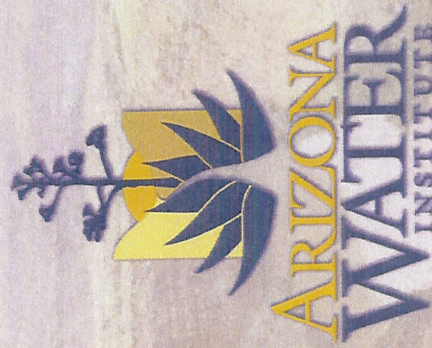
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Arizona Department of Commerce

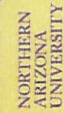
Bennett Curry  
 Phone: 602-771-1246 Email: [benmettrc@azcommerce.gov](mailto:benmettrc@azcommerce.gov)



A consortium of Arizona's three universities focused on water sustainability through research, technical assistance, education and technology.

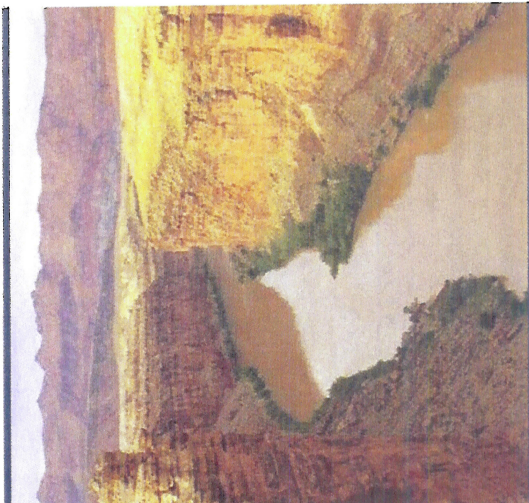


The University of  
**ARIZONA**  
 TUCSON ARIZONA



[www.azwaterinstitute.org](http://www.azwaterinstitute.org)

2nd Edition, April 2007



**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND  
**Emerging Issues**

	<i>FY 2007 REV BUDGET</i>	<i>FY 2007 ACTUAL</i>	<i>FY 2008 BUDGET</i>
<b>REVENUE</b>			
Carry Forward	\$ 354,505	\$ 354,505	\$ 702,769
TRIF Revenue	500,000	500,000	324,505
<b>TOTAL REVENUE</b>	<b>\$ 854,505</b>	<b>\$ 854,505</b>	<b>\$ 1,027,274</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ -	\$ -	\$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
<b>GRANTS/PROJECTS:</b>			
Beat the Odds Institute (CFA)	-	250,000	250,000
Arizona Academic Scholars Program (ABEC)	-	75,000	75,000
Projects to be determined	-	-	324,505
Subtotal Grants/Projects	<b>854,505</b>	<b>325,000</b>	<b>649,505</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 854,505</b>	<b>\$ 325,000</b>	<b>\$ 649,505</b>



## **ARIZONA BUSINESS AND EDUCATION COALITION (ABEC) ARIZONA ACADEMIC SCHOLARS INITIATIVE**

### **TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF) FY 2007 ACTUAL / FY 2008 BUDGET**

#### **FY 2007 INITIATIVE OVERVIEW**

The goal of the Arizona Academic Scholars Initiative is to build a community-based partnership around the goal of preparing our state's high school graduates for both careers and postsecondary training and education. Arizona, through the Arizona Business & Education Coalition (ABEC) in partnership with the Arizona Department of Education and the Governor's Office, was the 14th state to receive a 2-year, \$300,000 grant from the Center for State Scholars and the U.S. Department of Education in November 2004 to create and expand the Arizona Academic Scholars Initiative across Arizona. Arizona received a 6-month extension which completed the federal grant and expended the \$300,000 in May 2007. As a result of this extension, the bulk of the funds from the Arizona Board of Regents FY 2007 \$75,000 TRIF grant will carry forward into FY 2008. This carryover is advantageous as we move to expand the Initiative beyond the initial pilot communities.

As the Arizona Business & Education Coalition was planning for the expansion of the Arizona Academic Scholars Initiative, it held discussions with the State Board of Education (SBE) to determine how they might effectively collaborate in order to expand the Scholars Initiative statewide in anticipation of the more rigorous graduation requirements expected within the next several years. In May 2007, the SBE passed a resolution to integrate the Scholars Initiative at a statewide level in partnership with ABEC. Both SBE and ABEC staff are exploring possible options for working together to advance the Scholars course of study as an interim step toward implementation of more rigorous graduation requirements, which are likely to include 4 years of math.

#### **FY 2007 GOALS / OBJECTIVES**

1. Funding from the Arizona Board of Regents will provide financial assistance to ABEC and its partner(s) to maintain and expand the Arizona Academic Scholars Initiative beyond the original 8 pilot districts. The Scholars Initiative is seen as an interim step and as a way for school districts to begin building capacity toward attainment of this more rigorous graduation goal.
2. Increase the number of high school students successfully completing an academically rigorous curriculum.
3. Decrease the number of students requiring remediation in the community college system.

## **FY 2007 PERFORMANCE MEASURES / DELIVERABLES**

		<b>FY 2007 ACTUAL</b>
1	Expand the Arizona Academic Scholars Initiative beyond the original 8 pilot districts	<ul style="list-style-type: none"> <li>• Resolution passed by the State Board of Education, working in partnership with ABEC, to take a lead in advocating the Scholars Initiative statewide.</li> <li>• Amphitheater School District commits to the Scholars Initiative for the 2007-2008 school year.</li> <li>• In 2007 Pima County business partnerships were announced with UnitedHealthcare and the Pima County Business Education Roundtable to support Pima County school districts adopting the Scholars Initiative.</li> </ul>
2	Increase the number of high school students successfully completing an academically rigorous curriculum	<ul style="list-style-type: none"> <li>• Approximately 900 more Academic Scholars medallions were ordered in 2007 over the previous year (does not include Mesa Public Schools who did not use medallions) for seniors graduating as Arizona Academic Scholars.</li> </ul>
3	Decrease the number of students requiring remediation in the community college system	<ul style="list-style-type: none"> <li>• Unable to determine at this point.</li> </ul>

## **FY 2007 RESULTS AND ACCOMPLISHMENTS**

1. ABEC has completed the \$300,000, 2-year federal grant with the addition of a 6-month extension granted by WICHE. The grant-ending final report was submitted to WICHE effective May 31, 2007. Though the original project director resigned at the end of December 2006, a replacement director was in place immediately and continues to oversee the continuation of the Scholars Initiative.
2. At the end of the federal grant (May 2007), ABEC surveyed the key “users” of the pilot schools participating in the Arizona Academic Scholars Initiative. Survey findings reflect varying levels of response and statistical significance; however, their insight is important. Following are some of the key findings:
  - High School Students: Students who have seen the Scholars presentation find it valuable. It appears that seeing the Scholars presentation results in students planning to take rigorous courses. Multiple approaches to delivering the Scholars message may be valuable. Consistency and repetition of the Scholars message throughout high school is important.
  - Middle School Students: Seeing a Scholars presentation in 8th grade inspires middle school students to enroll in rigorous courses.

- High School Teachers: Almost 9 out of 10 high school teachers believe that the Scholars Initiative has had a positive impact on their participating students.
  - High School Guidance Counselors: 96% of guidance counselors agreed or strongly agreed that taking rigorous courses is important for post-secondary education and getting a job that pays well.
3. The State Board of Education, in partnership with ABEC, has adopted the Arizona Academic Scholars Initiative as an interim model toward more rigorous graduation requirements by the year 2012. This initiative continues to target the middle 50% of students with emphasis on the 8<sup>th</sup> / 9<sup>th</sup> grade presentations in partnership with a primary business or community organization. By encouraging all students to continue to take a course of study including rigor in math and science, our students will be more prepared for postsecondary success in both education and the workplace.
  4. The number of seniors graduating as Academic Scholars is increasing. Among the original 8 pilot districts, approximately 900 more medallions were ordered in 2007 compared with 2006. This figure does not include the Mesa Public Schools district (they chose not to use medallions as a form of recognition) or Snowflake (who ordered their own).
  5. The Pima County Business Education Roundtable and UnitedHealthcare (UHC) have committed to partnering with interested districts in Pima County. UHC has given \$25,000 to be used over a 5-year period to support medallions for Scholar graduates.
  6. Presentations have been made to key educators and business leaders who have shown interest in participating in the Scholars Initiative as we move into the new academic school year. Working with Chambers of Commerce appears to be a very viable option to encourage businesses and their local school districts to work together as a community to implement the Initiative. Examples include the Flagstaff Chamber of Commerce and the Gilbert Chamber of Commerce and their local school districts.
  7. Approximately 40 people attended a Scholars orientation held in conjunction with the ABEC annual conference in June 2007. Key panelists represented ABOR, SBE, Community Colleges, Guidance Counselors, District Superintendents, and 2 key business partners.

### **FY 2008 INITIATIVE OVERVIEW**

The goal of the FY 2008 Arizona Academic Scholars Initiative remains centered on the commitment to build community-based partnerships to prepare our state's high school graduates for both careers and postsecondary training and education. Now that we have the experience of 8 large and small, rural and urban, pilot communities from

around the state upon which to draw, the goal is to replicate additional successes throughout the state. The goal of allowing each community to work together as business and education partners in support of encouraging a Scholars high school course of study with rigor in math and science, along with additional academic areas, allows for the flexibility to make each partnership successful.

The collaboration between the State Board of Education and the Arizona Business & Education Coalition serves as a model for business and education partnerships to better prepare students and communities for the academic rigor which is necessary in today's postsecondary education and global economy. This collaboration will also serve to more quickly spread the Initiative statewide in anticipation of increased high school graduation requirements expected to be in place in the next several years.

**FY 2008 GOALS / OBJECTIVES**

1. Continue to expand the Arizona Academic Scholars Initiative beyond the original 8 pilot districts, in partnership with the State Board of Education.
2. Increase the number of high school students successfully completing an academically rigorous curriculum.
3. Advocate for increased rigor in math and science as part of increased high school graduation requirements.
4. Decrease the number of students requiring remediation in the community college and university systems.
5. Encourage businesses to provide incentives and/or academic support to high school students to continue on the Scholars course of study.

**FY 2008 PERFORMANCE MEASURES / DELIVERABLES**

		<b>FY 2008 PROJECTED</b>
1	Increase presentations of the Arizona Academic Scholars Initiative statewide	TBD
2	Increase the number of high school students graduating as Arizona State Scholars	TBD
3	Increase number of 8 <sup>th</sup> / 9 <sup>th</sup> graders receiving presentations regarding the Scholars course of study	TBD

**More information on the Arizona Academic Scholars Initiative may be found at: [www.azacademicscholars.org](http://www.azacademicscholars.org)**



**ARIZONA BUSINESS & EDUCATION COALITION (ABEC)**  
**ARIZONA ACADEMIC SCHOLARS INITIATIVE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 Actual / FY 2008 Budget

	<b>FY 2007 BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 BUDGET</b>	<b>FY 2009 BUDGET</b>
<b>REVENUE</b>				
Carry over from prior year			\$ 71,484	\$ 27,484
TRIF Grant	\$ 75,000	\$ 75,000	75,000	75,000
<b>TOTAL REVENUE</b>	<b>\$ 75,000</b>	<b>\$ 75,000</b>	<b>\$ 146,484</b>	<b>\$ 102,484</b>
<b>EXPENDITURES</b>				
<b>SALARY</b>				
Project Manager	5,000			
Support Staff			5,000	5,000
<b>OPERATING</b>				
Postage & Delivery	100	22	1,500	1,000
Printing & Reproduction	15,000	12	1,500	1,000
Scholar Recognition			14,000	18,000
Stipends			15,000	22,000
Supplies		20	1,000	1,000
<b>TRAVEL</b>				
Airfare		507	2,500	2,500
Auto/Mileage	500	237	2,500	2,500
Event Registration			2,000	2,000
Lodging			2,500	2,500
Meals			1,500	1,500
<b>CONTRACTUAL</b>				
Accounting	1,000			
Intern(s)			8,000	2,484
Marketing/Communications	15,000		12,000	4,500
State Program Director	27,000	2,625	30,000	30,000
Temp Services		83	1,000	1,000
Web Services & Support		10	1,000	1,000
Web/Graphic Design	500		15,000	2,000
Other Contracted Services			3,000	2,500
<b>TOTAL EXPENDITURES</b>	<b>\$ 64,100</b>	<b>\$ 3,516</b>	<b>\$ 119,000</b>	<b>\$ 102,484</b>

**FY 2008 Budget Narrative:**

Payroll: Support Staff covers salary of support staff.

Operating: Includes printing & distribution of campaign items such as posters, DVD, brochures, etc.

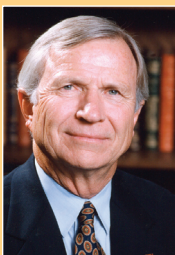
Scholar Recognition: Includes medallions for seniors graduating as Scholars.

Stipends: Provides \$1,000 to each participating school district's primary coordinator.

Travel: Includes travel for training of volunteers and presentations to educators and community members.

Auto/Mileage: Includes car rental fees, parking, taxis, and shuttles.

Contractual: Includes services of state program director (a contracted consultant).



**Dr. Lattie F. Coor**  
Chairman and CEO



**Dr. Sybil Francis**  
Executive Director

### TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

#### CONTENTS

Introduction.....	1
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The Beat the Odds (BTO) Institute was created to serve as the umbrella organization for all activities designed to implement the findings and recommendations of a landmark Arizona study, “Why Some Schools with Latino Children Beat the Odds...and Others Don’t.” The study is important because it found 12 Arizona schools that were successfully serving mostly poor, mostly Latino students. It demonstrates clearly that “demography is not destiny,” that all children can learn, and that our schools can be transformed to meet the human and social needs of the 21st century.

The Institute’s goal is to implement the “six keys to success” identified in the study by helping school leaders embed the principles into their culture and operating behavior.

*The Six Keys to Success are:*

#### Disciplined Thought

1. Clear Bottom Line – focus on achievement per student.
2. Ongoing Assessment – use data in the classroom to drive performance.

#### Disciplined People

3. Strong and Steady Principal – keep pushing ahead no matter the roadblocks.
4. Collaborative Solutions – share the responsibility for success.

#### Disciplined Action

5. Stick with the Program – pick a good one and make it work.
6. Built to Suit – customize instruction; one size does not fit all.

The establishment of the BTO Institute represents a major commitment by the Center for the Future of Arizona to further disseminate the study and implement its findings at the school level. In so doing, the Institute is mobilizing Arizona around a new goal – significantly improving “achievement per student” in all schools and aligning the state’s student performance standards with national and international standards.

The success of the Institute in achieving this goal depends in part on the development of the highly interactive website funded by the Arizona Board of Regents Technology and Research Initiative Fund (TRIF) Regents Innovation Fund. The website will provide users with an online forum for discussion and dialogue; access to case studies, new research and training tools; directories and links to other organizations actively engaged in education reform.



Significant progress in launching the Institute and developing the website has been made in FY 2007, the first year of TRIF funding.

## Performance Analysis

### Planning and Construction of Website

Phase 1 of the Beat the Odds website is in the final stages of construction with field testing due to begin in August 2007. See Addendum or visit <http://www.beattheoddsinstitute.org> to view the site. Phase 2 will include constructing the policy/legislation tracking functions. During FY 2008, the student fellowship program to support the ongoing research needs of the website will be implemented.

### Partnerships

The Beat the Odds Website Initiative was a powerful catalyst in building a network of partnerships during FY 2007, the first year of development.

- **Schools**

Regular meetings with Arizona principals and superintendents have been held throughout the year, including two leadership seminars that helped define the newly created School Partners Program. As a result, approximately 25 Maricopa County schools are signing formal agreements with the Institute to pursue designation as a Beat the Odds School. The designation requires schools to achieve performance criteria developed by the BTO Institute in consultation with participating principals and superintendents. The Institute will support the schools by providing a range of services, including the new TRIF-funded website that will serve as an online resource center. The website includes a password protected “partners only” section for members of the School Partners Program with features requested by participating schools, including secure bulletin boards, case studies and a calendar of webcasts. Other Arizona schools are working to implement study findings on their own and will be encouraged to use the website as a valuable resource.



- **Partners**

Numerous organizations have expressed interest in working with CFA to integrate BTO principles into their professional training programs and to support statewide implementation in Arizona schools.

Program partners include Greater Phoenix Leadership, the Arizona Latino Research Enterprise and all major education associations. Under continuing discussion are partnership opportunities with Teach for America, the Pew Center for the States, WestEd, the Governor’s P-20 Council and Arizona’s three public universities. The new website will provide links to all partner organizations.

- **Funding**

Grants and gifts to date leverage TRIF funds (\$250K in year 1) at the rate of nearly 3:1. Funding partners include the Arizona Community Foundation (\$100K), Stardust Foundation (\$250K), the Salt River Pima Indian Community (\$250K), and the Helios Foundation (\$66K) as well as a major gift from Rusty and Rosie Lyon (\$100K). In addition, the Stardust Foundation has pledged \$150K annually to fund the director position for the Beat the Odds Institute.

## Collateral Activities

- National dissemination of Beat the Odds includes meetings in Washington, D.C. with the Aspen Institute Congressional Breakfast, the Congressional Hispanic Congress and with members of the Arizona Congressional delegation. Special presentations were made to the National Charter Schools Conference and the National Migrant Education Conference. In addition, Dr. Lattie Coor served as the key note speaker for the Foundation Roundtable of Santa Barbara, which attracted 450 people representing 150 California nonprofits.
- Beat the Odds was featured in a television documentary on Jim Collins that was nationally broadcast by 245 PBS stations in January 2007. The documentary featured Southwest Airlines, Starbucks and the Dallas Police Force in addition to Beat the Odds. The Arizona study was cited by Collins as an exemplar in how “Good to Great” principles apply to the social sector.
- A comprehensive assessment and evaluation program has been developed for all activities related to Beat the Odds, including the website.

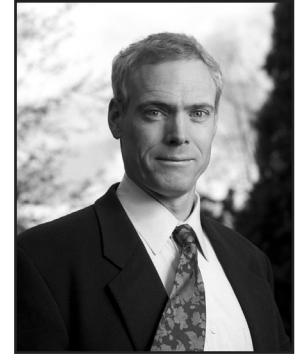


Photo credit: rayng.com

Jim Collins

## Financial Information

### Fiscal year ending June 30, 2007

	FY 2007 Actual	FY 2008 Budget	FY 2009 Budget
<b>REVENUE</b>			
Carry Forward	\$ 0	\$69,850*	
New TRIF Revenue	250,000	250,000	250,000
<b>TOTAL REVENUE</b>	<b>\$250,000</b>	<b>\$319,850</b>	<b>\$250,000</b>
<b>OPERATING BUDGET</b>			
Personal Services	75,695	168,305	122,000
Outside Vendors	97,520	87,480	80,000
All Other Operating	6,935	12,065	8,000
Student Program		52,000	40,000
<b>TOTAL EXPENDITURES</b>	<b>\$180,150</b>	<b>\$319,850</b>	<b>\$250,000</b>

\*TRIF funding was received mid-year and thus not fully expended in FY 2007. Carry forward funding required for completion of phase one website development.

## Goals & Results

The mission of the Beat the Odds Institute and website is to improve “achievement per student” by working collaboratively with educators, policy makers and funders to embed BTO principles in Arizona’s K-12 schools and beyond.

### Indicative Results in FY 2007 (year 1)

1. **RETURN ON INVESTMENT:** Grants and gifts to date leverage TRIF funds (\$250K in year 1) at the rate of nearly 3:1. It is anticipated that the rate will increase in FY 2008 as funding is secured to support schools joining the School Partners Program. To further leverage TRIF funding, planning is underway to develop the website's student internship program in collaboration with the Wayne and Maureen Doran Scholarship Program. The goal is to provide Doran Scholars with a sequential experience that includes school-based community building, policy research at state/federal levels to support the website content, and a capstone senior project. The Center will provide more information on the program as it develops.
2. **KNOWLEDGE TRANSFER:** In addition to ongoing dissemination of the BTO study at both state and national levels, approximately 25 schools in Maricopa County have signed formal agreements with the Institute to pursue designation as a Beat the Odds School, which requires schools to achieve performance criteria developed by the BTO Institute in consultation with members of the newly created School Partners Program. The number will expand in FY 2008 as the program moves to a statewide platform.
3. **WORKFORCE DEVELOPMENT:** The Institute's partnership with Greater Phoenix Leadership and its partner organizations throughout the state will provide ongoing opportunities to connect BTO activities to the efforts of the business sector to achieve the skilled workforce Arizona needs for the future.
4. **EDUCATION OUTREACH:** Partnerships have been developed with numerous schools, foundations, professional associations and organizations committed to educational success for Arizona. The Institute will continue pursuing both "top-down" and "bottom-up" strategies during FY 2008 to expand the network of partnerships supporting Beat the Odds.



### Management

#### **Center for the Future of Arizona**

Lattie Coor, Chairman and CEO

### Advisory Board

Lattie F. Coor, Chairman and CEO, *Center for the Future of Arizona*

Nadine Mathis Basha

George Dean, President and CEO of the *Greater Phoenix Urban League*

Paul J. Luna, President and CEO of *Helios Foundation*

Jack Pfister

## SUCCESSFUL SCHOOLS DO THINGS DIFFERENTLY



What does it take to get great results in schools with mostly poor, mostly Latino students? That was the question facing the Center for the Future of Arizona when it launched a landmark study that has captured national attention. The results of the study, "Beat the Odds," show clearly that successful schools do things differently. [Learn More >](#)

### BTO PARTNERS PROGRAM

The School Partners Program is an opportunity for individual schools to work closely with the Center for the Future of Arizona (CFA) to achieve formal designation as a Beat the Odds school. The goal of the program is to significantly improve each school's "achievement per student" as measured by the state's AIMS test.

**6 KEYS TO SUCCESS**  
Beat the Odds yielded many insights, a number of them contrary to conventional wisdom, but one key result is the unearthing of six keys to success. Together they provide a framework for helping schools achieve the high level of student achievement that Arizona and the nation need for the future. [Learn More >](#)

### BEAT THE ODDS STUDY

The Center for the Future of Arizona and the Morrison Institute at Arizona State University have worked together on Beat the Odds... Why Some Schools with Latino Children Beat the Odds and Others Don't – a groundbreaking study examining Latino Education in Arizona. A Spanish-language summary of the "Beat the Odds" research findings is also available. [Learn More >](#)

### A MESSAGE FROM DR. LATTIE COOR

*The keynote address reprinted below was delivered to the Arizona Business and Education Coalition at its June 19 conference.*

### Do We Have the Courage to Tackle the New Global Agenda?

The challenge of this conference is to align our educational aspirations in Arizona with the new global agenda. For Arizona, I believe that alignment requires two key elements – 1) aligning Arizona student performance standards with national and global standards; and 2) creating a fully competitive, "next generation" middle class for Arizona... [Learn More >](#)

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**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND  
 Information Technology Collaborative

	<i>FY 2007 REV BUDGET</i>	<i>FY 2007 ACTUAL</i>	<i>FY 2008 BUDGET</i>
<b>REVENUE</b>			
Carry Forward	-	-	-
TRIF Revenue	180,000	180,000	250,000
<b>TOTAL REVENUE</b>	<b>\$ 180,000</b>	<b>\$ 180,000</b>	<b>\$ 250,000</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ 10,000	-	-
ERE	-	-	-
All Other Operating	1,000	345	-
Subtotal Operating Budget	<b>11,000</b>	<b>345</b>	<b>-</b>
<b>GRANTS/PROJECTS:</b>			
Fred Estrella Consulting	-	12,477	-
Darel Eschbach Contract	-	1,839	-
SharePoint Project	-	12,460	-
Moran Contract	-	100,000	-
Network Management System	-	24,100	-
Other Projects to be determined	-	-	250,000
Subtotal Grants/Projects	<b>169,000</b>	<b>150,876</b>	<b>250,000</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 180,000</b>	<b>\$ 151,221</b>	<b>\$ 250,000</b>

**FY 2007 Actual / FY 2008 Budget  
 Regents Innovation Fund  
 IT Collaborative**

**FY 2007 INITIATIVE OVERVIEW**

The Arizona Auditor General has recommended that the Board of Regents exercise more oversight of university information technology. An IT project approval process and extensive reporting requirements for IT expenditures are now in place. Collaborative IT projects that can improve service and/or result in cost savings hold ongoing particular interest to the Regents. Numerous possibilities exist for the efficient and effective use of seed money, including the continued use of consultants to update the architecture developed for planning future IT development. Other examples include implementation of a central office SharePoint collaborative site and collaborative IT projects at the three universities.

**FY 2007 GOALS/OBJECTIVES**

1. Continue the Tri-U effort to adopt and implement a trusted tri-university federated identity architecture, which would also provide the opportunity to establish identity trust relationships with other federal, state, and higher education idM systems; includes training and consultant assistance.
2. Development of an Information Technology Architecture facilitates the application of IT to university initiatives and projects. Its goal is to aid in the efficient and effective implementation of technology on our campuses by describing a direction for current and future IT activities, supported by underlying principles, standards, and best practices.
3. SharePoint project – continue use of SharePoint to enhance central office internal operations and improve access to information for the Regents and universities.
4. Retain a consultant to research and identify future IT collaborative projects.

**FY 2007 PERFORMANCE MEASURES/DELIVERABLES**

	FY 2007 <i>Projected</i>	FY 2007 <i>Actual</i>
<b>Return on Investment</b>		
1. SharePoint Implementation	Completed	Completed
2. Information Technology Architecture Maintenance	Completed	Completed
3. Tri-University Identity Federation for the Arizona University System (ATIF) Study	Completed	Completed
4. Moran Report on Collaborative Projects	Completed	Completed

**FY 2007 RESULTS AND ACCOMPLISHMENTS**

1. A report has been submitted by the Burton Group Consultants on a tri-university federated identity architecture which is under review.
2. The Tri-University Architecture document will remain highly flexible to accommodate the ever-changing nature of IT. Its goal is to aid in the efficient and effective implementation of technology on our campuses, supported by underlying principles, standards, and best practices. It will further facilitate tri-university collaboration efforts by establishing a common vision for the future of IT on our campuses. The use of technology is a large and growing element of the universities' environment and overall expenditures. Arizona's universities collectively are interested in increasing service quality and saving money through the best possible use of IT.
3. The design, training, and implementation of SharePoint for the central office and related university departments has been completed for the Audit, Capital, Technology Oversight, Strategic Planning Committees and Regents Resource Center collaborative work sites, installation of a dedicated server, and training for key staff. Other Committees' sites and central office collaborative worksites are being implemented on a sequential plan.
4. The Moran Technology Consultant report recommended 12 areas for university IT collaborative plans on IT governance and university IT strategic plans.

**FY 2008 INITIATIVE OVERVIEW**

Collaborative IT projects that can improve service and/or result in cost savings continue to be of particular interest to the Regents. A consultant to facilitate ASU's implementation of its HR and Student Information Systems (OASIS) has been engaged. The OASIS system is a version of PeopleSoft. SharePoint for the central office continues to be implemented and conversion to the next generation of SharePoint is underway. Numerous possibilities exist for the efficient and effective use of seed money, such as the continued use of a consultant to maintain and support the architecture for planning future IT development at the three universities and to monitor the ASU OASIS project.

**FY 2008 GOALS/OBJECTIVES**

Additional goals and objectives will be provided when final IT projects are selected.

1. Continue implementation of SharePoint.
2. Oversee ongoing IT Architecture development.
3. Oversee consultant for OASIS implementation at ASU.
4. Tri-University Identity Federation for Arizona University System (ATIF) consulting report will be reviewed and next steps identified.
5. Support collaborative university IT projects identified in the Moran Technology Consulting report.
6. Start implementing three collaborative projects including various IT security areas from the Moran Technology Consulting report.

**FY 2008 PERFORMANCE MEASURES/DELIVERABLES**

	<b>Return on Investment</b>	<i>Projected</i>
1.	Continued oversight of IT Architecture development.	On Schedule
2.	Implementation of major central office functions using SharePoint, including Regents Resource Center.	On Schedule
	<b>Partnerships/Collaborations</b>	
3.	Consulting on Tri-University Identity Federation.	On Schedule
4.	Moran Consulting on university collaborations.	On Schedule
5.	OASIS consulting report to the Technology Oversight Committee.	On Schedule

**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND

**Learner Centered Education Course Redesign Initiative (LCE-CRI)**

	<b>FY 2007 REV BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 BUDGET</b>
<b>REVENUE</b>			
Carry Forward	\$ 539,013	\$ 531,621	\$ 418,027
TRIF Revenue	289,143	300,000	441,973
<b>TOTAL REVENUE</b>	<b>\$ 828,156</b>	<b>\$ 831,621</b>	<b>\$ 860,000</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ 3,526	\$ 8,397	-
ERE	716	2,064	-
All Other Operating (NCAT Contract)	284,900	60,307	160,000
Subtotal Operating Budget	<b>289,142</b>	<b>70,768</b>	<b>160,000</b>
<b>GRANTS/PROJECTS:</b>			
FY 2008 LCE Grants TBD			<b>500,347</b>
FY 2007 LCE Grants	-	-	-
FY 2006 LCE Grants	453,600	342,966	110,634
FY 2002-2005 LCE Grants	85,413	(3,606)	89,019
Subtotal Grants/Projects	<b>539,013</b>	<b>339,360</b>	<b>700,000</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 828,155</b>	<b>\$ 410,128</b>	<b>\$ 860,000</b>

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**TECHNOLOGY AND RESEARCH INITIATIVE FUND  
(TRIF)**

**LEARNER CENTERED EDUCATION**



September 2007

**LEARNER CENTERED EDUCATION (LCE) INITIATIVE**

In 2001, the Arizona Board of Regents authorized \$500,000 of the TRIF Regents Innovation Fund from Proposition 301 monies for grants to faculty to improve and expand learner-centered education throughout the university system. The purpose of learner-centered education is to change the dynamics of student-faculty interaction to optimize student learning and learning outcomes (focusing on what is learned rather than on what is taught); to utilize technology to create opportunities for student learning; to utilize student peer interaction (collaborative learning); and to create more active learning venues for students beyond the standard lecture and discussion method.

**Learner Centered Education Grants 2002-2006**

Over five funding cycles from 2002 through 2006, 11 - 20 grants were awarded annually to faculty for projects which addressed learner centered education in the areas of faculty development; course or program modification; assessment; or research . Awards ranged from up to \$24,999 for individual faculty, course or program projects to \$100,000 for substantial tri-university initiatives.

Funding for the last year of this five-year period, the 2006 cycle, began on April 1, 2006, and will culminate in September 30, 2007.



*The Tri-University collaboration on learner centered practice (2004).*

Consistent with other TRIF projects, an evaluation of the LCE grant program was conducted in 2006 to provide direction for the program's future. The resulting important information on both project design and project management informed the decision to build on the past program and bring the LCE grant program to a new, higher level of institutional engagement, a new level of impact, and a new level of accountability in 2007.

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## LEARNER-CENTERED EDUCATION AWARDS, 2002-2007

### LCE PROJECTS AWARDED 2002-2006, BY CAMPUS

	2006		2005		2004		2003		2002		TOTAL	
	#	\$	#	\$	#	\$	#	\$	#	\$	#	\$
ASU	2	\$49,911	4	\$120,432	3	\$99,690	8	\$214,191	4	\$90,000	21	\$574,224
NAU	5	165,536	4	124,888	5	104,985	2	60,319	7	141,922	23	597,650
UA	3	84,948	4	97,916	6	141,139	5	125,930	8	195,137	26	645,070
NAU/UA	0	0	0	0	0	0	1	24,883	0	0	1	24,883
ASU/UA	1	48,871	0	0	0	0	0	0	0	0	1	0
NAU/ASU	0	0	0	0	1	49,400	1	50,000	0	0	1	99,400
TRI-U	0	0	2	195,700	1	99,997	1	95,555	1	100,000	5	540,123
<b>TOTALS:</b>	<b>11</b>	<b>\$349,266</b>	<b>14</b>	<b>\$538,936</b>	<b>16</b>	<b>\$495,211</b>	<b>18</b>	<b>\$570,878</b>	<b>20</b>	<b>\$527,059</b>	<b>79</b>	<b>\$2,481,350</b>

### OVERVIEW OF 2007 LCE COURSE-REDESIGN INITIATIVE AWARDS

Institution	Course(s) to be Redesigned	Two-Year Budget	Total Enrollment in Current Course(s)	Annual Projected Savings in Cost per Student*
ASU	ACC 230: Uses of Accounting Information I	\$50,285	1,312	\$107,602
ASU	CHM 101: General Chemistry	\$100,000	2,640	\$159,800
ASU	College Algebra	\$50,000	1,700	\$243,744
ASU	CSE 180: Computer Literacy	\$51,763	299	\$56,399
ASU	GLG 101 Introduction to Geology I, Physical	\$52,911	2,200	\$52,800
ASU	MGT 300 Organizational Behavior and Leadership	\$49,665	270	\$40,770
ASU	CMN 225: Public Speaking	\$41,178	200	\$33,600
ASU	WST 100 Women and Society WST 300 Women in Contemporary Society	\$45,218	2,400	\$38,400
NAU	BIO 181 Introductory Biology	\$49,518	1,050	\$76,650
NAU	PSY 101 Introduction to Psychology	\$49,992	1,925	\$32,725
UA	MCB 181: Introductory Biology	\$50,000	1,500	\$229,500
UA	CHEM 103/104: Fundamentals of Chemistry (and lab)	\$49,911	2,000	\$50,000
UA	NATS 101 A Geological Perspective	\$50,331	1,200	\$310,800
	<b>TOTALS:</b>	<b>\$690,772</b>	<b>18,696</b>	<b>\$1,432,790</b>

\*NOTE: Overall savings calculations in this column are based on current enrollment levels. However, in several projects the reduction in the cost per student comes through an increase in the total enrollment capacity at no or minimal increase in overall instructional cost. In one case enrollment capacity is expected to increase 300% through the redesign.

*Learner-centered education has been a high priority for the Arizona Board of Regents, as reflected in the Arizona University System's Strategic Directions.*

## FINANCIAL INFORMATION

	FY 2002 ACTUAL	FY 2003 ACTUAL	FY 2004 ACTUAL	FY 2005 ACTUAL	FY 2006 ACTUAL	FY 2007 REV BUDGET	FY 2007 ACTUAL	FY 2008 BUDGET
<b>REVENUE</b>								
Carry Forward	-	\$ 297,864	\$ 307,772	\$ 293,560	\$ 18,965	\$ 539,013	\$ 531,621	\$ 418,027
TRIF Revenue	969,239	560,008	516,500	500,000	101,428	289,143	300,000	441,973
<b>TOTAL REVENUE</b>	<b>\$ 969,239</b>	<b>\$ 57,872</b>	<b>\$ 824,272</b>	<b>\$ 93,560</b>	<b>\$ 820,393</b>	<b>\$ 828,156</b>	<b>\$ 831,621</b>	<b>\$ 860,000</b>
<b>EXPENDITURES</b>								
<b>OPERATING BUDGET</b>								
Personal Services	\$ 3,133	\$ 2,962	\$ 9,365	\$ 5,180	\$ 9,959	\$ 3,526	\$ 8,397	-
ERE	744	2,461	1,491	828	2,502	716	2,064	-
All Other Operating	2,469	5,254	2,121	1,575	831	284,900	60,307	160,000
Subtotal Operating Budget	\$ 6,326	\$ 0,677	\$ 2,977	\$ 7,583	\$ 13,292	\$ 289,142	\$ 40,768	\$ 160,000
<b>GRANTS/PROJECTS:</b>								
FY 2002-2005 LCE Grants	\$ 567,107	\$ 554,488	\$ 14,212	\$ 454,666	\$ 234,980	\$ 85,413	\$ (3,606)	\$ 89,019
FY 2006 LCE Grants	-	-	-	-	29,900	453,600	342,966	110,634
FY 2007 LCE Grants	-	-	-	-	-	-	-	-
FY 2008 LCE Grants TBD	-	-	-	-	-	-	-	500,347
Subtotal Grants/Projects	\$ 67,107	\$ 554,488	\$ 514,212	\$ 454,666	\$ 264,880	\$ 539,013	\$ 339,360	\$ 700,000
<b>EXPENDITURES, GRAND TOTAL</b>	<b>\$ 573,433</b>	<b>\$ 575,165</b>	<b>\$ 527,189</b>	<b>\$ 462,249</b>	<b>\$ 278,172</b>	<b>\$ 828,155</b>	<b>\$ 410,128</b>	<b>\$ 860,000</b>

Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a six-tenths cent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

## 2007-09 LCE INITIATIVE...LOOKING FORWARD

### 2007-2009 LCE Course Redesign Initiative

In September 2006, a Request for Proposals (RFP) was issued for a consultant who could help develop a grant program with clear, achievable system-wide goals and well-defined accountability measures. In December 2006, a contract was awarded to the National Center for Academic Transformation (NCAT). NCAT is nationally known for its course redesign model for improving learning in large enrollment courses, incorporating technology and maximizing resources.

The LCE Course Redesign Initiative (CRI), based on the highly-successful NCAT model, takes the Regents' interest in learner-centered education to a new level. The LCE CRI focuses on the redesign of large-enrollment, multi-section "gateway" or undergraduate courses, using technology-supported active learning strategies. **The overall goal:** To achieve improvements in student learning outcomes as well as efficiencies in instructional costs.

The new LCE CRI program extends from January 2007 through September 2009. The initiative is funded through the Regents Innovation Fund for the 2007-11 funding period. Because of the timing and scope of the Course Redesign Initiative, two years of funding (\$500,000 per year, FY 2007 and FY 2008), or a total of \$1,000,000, will be dedicated to these projects.

### 2007 LCE CRI Awards

From February through July 2007, project teams consisting of faculty and administrators at each of the three Universities went through a structured series of steps that called on them to do intensive analysis and planning as the foundation for their final redesign proposals.

The LCE CRI project awards were selected and announced in August 2007. A total of 13 projects were approved, representing a wide diversity of academic areas and course redesign strategies.

(continued on page 4)

*(continued from page 3)*

Among the highlights of the 2007 projects:

- The total amount awarded for the 13 projects is \$690,772 for the two-year cycle.
- Total current annual enrollment for all the proposed redesign courses is 18,696.
- Project teams estimate a total annual savings of \$1,432,790, averaging \$77 per student.

Many project teams expect to see significant benefits beyond improved student outcomes and cost savings, including:

- Increased enrollment capacity (in one case up to 300%);
- Reduction in bottleneck courses in progressive curricula; and
- Reductions in drop-fail-withdraw rates.

**Looking Ahead . . .**

The 13 funded projects will be pilot-tested during the spring 2008 semester and implemented course-wide during the 2008-2009 academic year, followed by program evaluation and dissemination. This two-year cycle of the LCE grant program will conclude in September 2009, with an assessment provided by NCAT.

Faculty participating in this grant cycle will gain the knowledge and skills to work with other departments in their institutions to apply the NCAT redesign model to additional courses. Expanding the model to other courses is, in turn, likely to generate greater savings in instructional costs, beyond the estimated \$1.4 million in annual savings from the initial redesign projects.

<b>PERFORMANCE MEASURES / DELIVERABLES</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007 PROJECTED</b>
Number of courses modi-	95	123	104	68	72	17
Faculty addressing curricu- lum through LCE grants	188	147	111	141	133	65
Students affected by LCE grant projects	14,000	5,362	6,392	8,491	10,500	18,696

## ADVISORY BOARDS

### LCE Team

**Functions:**

Provides oversight of LCE program  
Approves funding for grants  
Approves substantive changes to grant process/criteria

**Members:**

**3 Regents**

Christina Palacios, Chair  
Fred DuVal  
Mary Venezia

**3 Provosts**

Betty Capaldi, ASU  
Liz Grobsmith, NAU  
Eugene Sander, UA

**3 Arizona Faculties Council Members**

William Verdini, ASU  
Charles Connell, NAU  
Robert Mitchell, UA

### LCE Advisory Council

**Functions:**

Develops grant review process and reviews rubric  
Revises grant processes annually  
Reviews, revises RFP; recommends substantial changes to LCE Team  
Participates in grant review and serves as training coordinators for their campus

**Members:**

**Provost Appointees**

Arthur Blakemore, ASU  
Susanna Maxwell, NAU  
Jerry Hogle, UA

**3 Arizona Faculties Council Members**

William Verdini, ASU  
Charles Connell, NAU  
Jennifer Jenkins, UA

## LEARN MORE

- Visit the LCE link on the home page of the Arizona Board of Regents website, at [www.azregents.edu](http://www.azregents.edu).
- Contact Maryn Boess, Grants Program Manager, Arizona Board of Regents, 2020 N. Central Ave., Suite 230, Phoenix, AZ 85004, (602) 229-2560 , [maryn.boess@azregents.edu](mailto:maryn.boess@azregents.edu)



**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND

**The University of Arizona College of Medicine-Phoenix, in partnership with Arizona State University-Planning**

	<b>FY 2007 BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 BUDGET</b>
<b>REVENUE</b>			
Carry Forward	\$ -	-	\$ -
TRIF Revenue	250,000	250,000	250,000
<b>TOTAL REVENUE</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ -	-	\$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
<b>GRANTS/PROJECTS:</b>			
Molera Alvarez Group	100,000	104,000	100,000
To be determined	150,000	-	150,000
Subtotal Grants/Projects	<b>250,000</b>	<b>104,000</b>	<b>250,000</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 250,000</b>	<b>\$ 104,000</b>	<b>\$ 250,000</b>

## **FY 2007 RESULTS AND ACCOMPLISHMENTS**

FY 2007 funds were expended in support of the planning for the development of The University of Arizona College of Medicine-Phoenix, in partnership with Arizona State University on the Phoenix Biomedical Campus (PBC). At present, the PBC comprises the Translational Genomics Research Institute (TGen) research building; and Phase One of the College of Medicine-Phoenix consisting of the three former PUIHS buildings and the first Arizona Biomedical Collaborative research building (ABC 1).

Researchers from The University of Arizona and Arizona State University began moving into ABC 1 in July 2007. In an unprecedented partnership, researchers from ASU's Department of Biomedical Informatics fill the first two floors, while UA researchers fill the wet lab space on the top two floors.

The Phase One facilities on the PBC support the College of Medicine-Phoenix class of 24 and a larger class to enter in 2008. Phase Two facilities will be necessary to expand the College of Medicine-Phoenix class size beyond initial levels. Renovation work on the three former Phoenix Union High School buildings has been completed, and a grand opening was held on October 10, 2006. Arizona Biomedical Collaborative 1 (ABC 1), the first College of Medicine research building on the PBC, opened in March 2007. The inaugural class of 24 first-year medical students was welcomed at a community luncheon on August 3, 2007, and held its White Coat ceremony on August 10, 2007.

In order to expand the medical school to its full compliment of 150 first-year students, planning is underway for Phase Two facilities. Phase Two projects will provide teaching space needed to expand the school to its full complement of 150 first-year students. However, Phase Two research space for the College of Medicine-Phoenix is not expected to meet all future needs. The campus will continue to grow, with additional research and clinical space required to accommodate expanding faculty appointments. At present, the College is exploring alternative methods to provide research space, including joint appointments with other institutions that may provide primary office or research space for such shared individuals.

Working with SmithGroup consultants, programming studies were conducted during 2006 and early 2007 in concert with The University of Arizona College of Medicine, The University of Arizona College of Pharmacy, Arizona State University, Northern Arizona University (which will be basing new allied health educational programs on the PBC), and the City of Phoenix to define the scope and character of Phase Two of the PBC. The focus of work has been to establish large-scale campus requirements in terms of the type of educational and research spaces that would be included in the next phase of development. Space programs have been developed to the level of detail required for campus-level planning and cost

estimating. Further program refinement will be required in the coming year to add the level of functional and spatial detail required to begin schematic building design and construction drawings.

### **FY 2008 INITIATIVE OVERVIEW**

The Legislature approved continued and additional funding for the UA College of Medicine-Phoenix in the FY 2008 state budget. These funds will be augmented by UA and ASU TRIF funds to continue planning for the expansion of the Campus. Phase Two planning is underway to provide teaching and research space to expand the College to full build out of 150 first-year medical students. Phase Two projects will include a Medical Education Building (MEB); a second university research building, ABC 2, which will include dedicated research space, shared core research support, and space for the National Institutes of Health (NIH) Clinical and Translational Science Award (CTSA) effort; and structured parking for approximately 1,000 cars. The total estimated square footage for Phase Two is approximately 750,000 GSF, not including parking.

#### **Medical Education Building (MEB)**

The Medical Education Building (MEB) will include classrooms, a state-of-the-art simulation center, pre-clinical training suite, anatomy laboratories, and faculty offices for UA, ASU, and NAU. The facility will provide a unique opportunity to train healthcare professionals in an integrated environment. Estimated square footage for the MEB is 309,000 GSF. The current project schedule reflects a mid-2009 construction start with a Summer 2011 completion.

#### **Arizona Biomedical Collaborative 2 (ABC 2) Research Building**

Arizona Biomedical Collaborative 2 (ABC 2), the second College of Medicine-Phoenix research building, will accommodate 82 investigators from UA, ASU, and NAU and, potentially, from collaborating public and privately sponsored research institutes including TGen. This facility will focus on disease-based translational research in the areas of cancer, neuroscience, diabetes, and cardiovascular disease. Dedicated lab space will be augmented with a shared research core that will include a vivarium, advanced imaging modalities, and other infrastructure necessary to support an active research agenda. Estimated square footage for ABC 2 is 404,000 GSF. The current project schedule reflects a mid-2009 construction start with a Fall 2011 completion.

Space in ABC 2 will be dedicated for the Clinical and Translational Science Award. This will include clinical research space designed to support a state-wide application for the CTSA grant. The grant application is being prepared for submission to NIH in October 2007, drawing upon expertise from across the state. The CTSA space links clinical

research and education. Advances then can be delivered to the community in the form of improved medical care, treatment, and prevention. Estimated square footage for the CTSA space in ABC 2 is 21,000 GSF.

The expansion of the College of Medicine-Phoenix class size to 150 students will be accommodated by the planned Medical Education Building. The expanded class size will require additional basic science faculty, many of whom will be housed in ABC 2, and will also require full-time clinical faculty. Additional adjunct clinical faculty will also be located throughout Phoenix.

In addition to the planning for the MEB and ABC 2, a separate master planning effort is underway for the Phoenix Biomedical Campus. This study is addressing the capacity of the site, and the adjacencies of the facilities and other healthcare components of an academic health science center, including a teaching hospital, clinical enterprises, and essential infrastructure.

**FY 2008 GOALS/OBJECTIVES**

1. Complete planning, programming, and design of Medical Education Building (MEB).
2. Complete planning, programming, and design of ABC 2.
3. Complete master plan for PBC.

**FY 2008 PERFORMANCE MEASURES/DELIVERABLES**

		FY 2008 Projected
	<b>Return on Investment</b>	
1.	Complete planning, programming, and design of MEB.	Completed
2.	Complete planning, programming, and design of ABC 2.	Completed
3.	Complete master plan for PBC.	Completed
	<b>Partnerships/Collaborations</b>	
4.	Continue collaborative effort among UA, ASU, and NAU.	Ongoing
5.	Continue collaborative effort with City of Phoenix.	Ongoing

**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND  
**Statewide Transfer Articulation System**

	<b>FY 2007 REV BUDGET</b>	<b>FY 2007 ACTUAL</b>	<b>FY 2008 BUDGET</b>
<b>REVENUE</b>			
Carry Forward	\$ -	\$ -	\$ -
TRIF Revenue	-	-	125,000
<b>TOTAL REVENUE</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 125,000</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ -	\$ -	\$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
<b>GRANTS/PROJECTS:</b>			
Technology Enhancement	-	-	125,000
Subtotal Grants/Projects	-	-	<b>125,000</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 125,000</b>

**FY 2008 INITIATIVE OVERVIEW**

In May 2007 a report was issued on a study of Arizona’s transfer articulation system for community college students transferring to one of the public universities. Prepared by Hezel Associates of Syracuse, New York, Arizona was given generally high marks; however, one area identified for significant needed improvement was online services for transfer students. Students, faculty, academic advisors, and staff need easy access to information on transfer to support accurate decision-making, but the current system was given poor ratings for ease of use. As a result, the Arizona Board of Regents approved a one time allocation \$125,000 of FY 2008 TRIF Regents Innovation Funds for improvements. The funds will support two major projects: 1) An upgrade to the navigation, layout, and design of the Arizona Transfer Articulation Support System (ATASS) website; and 2) the implementation of an automated system which will allow students to easily upload their completed courses to determine how credits will apply to major requirements at the universities; this system will provide students and advisors with a very tailored, easy-to-access academic plan for successful transfer.

**FY 2008 GOALS/OBJECTIVES**

1. Issue an RFP for a consulting firm to redesign the ATASS website (October 2007).
2. Implement the new design by May 2008.
3. Install software at all 10 community college districts and 3 universities for transcript upload (May 2008).

**FY 2008 PERFORMANCE MEASURES/DELIVERABLES**

Elements of the Hezel Study will be replicated, such as a satisfaction survey, once the new systems are in place and enough time has passed to determine their impact.

		<i>Projected</i>
<b>Return on Investment</b>		
1. Increased use of ATASS website		TBD
2. Better student, staff, faculty, and advisor satisfaction with website		TBD
3. Students better prepared to transfer to the universities		TBD

**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 REGENTS INNOVATION FUND  
**Operating**

	<i>FY 2007 REV BUDGET</i>	<i>FY 2007 ACTUAL</i>	<i>FY 2008 BUDGET</i>
<b>REVENUE</b>			
Carry Forward	-	-	-
TRIF Revenue	73,465	73,465	110,000
<b>TOTAL REVENUE</b>	<b>73,465</b>	<b>73,465</b>	<b>110,000</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	49,000	57,221	79,939
ERE	11,100	15,187	22,383
All Other Operating	13,365	2,572	7,678
Subtotal Operating Budget	<b>73,465</b>	<b>74,980</b>	<b>110,000</b>
<b>GRANTS/PROJECTS:</b>			
Subtotal Grants/Projects	-	-	-
<b>EXPENDITURES GRAND TOTAL</b>	<b>73,465</b>	<b>74,980</b>	<b>110,000</b>

The Operating budget supports implementation of Regents Innovation Fund and TRIF Strategic Investments (TSI) projects, as well as administration of the system's TRIF fund, including budget preparation, accounting, and reporting functions. The FY 2008 Operating budget is larger than in previous years because administrative costs for all Regents Innovation Fund projects have for the first time been removed from the individual project budgets and aggregated in the Operating budget.

**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
 TRIF STRATEGIC INVESTMENTS (TSI)  
 Summary

	FY 2007 REV BUDGET	FY 2007 ACTUAL	FY 2008 BUDGET
<b>REVENUE</b>			
Carry Forward	-	-	2,849,224
TRIF Revenue	2,934,048	2,934,055	2,000,000
<b>TOTAL REVENUE</b>	<b>\$ 2,934,048</b>	<b>\$ 2,934,055</b>	<b>\$ 4,849,224</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	-	-	-
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
<b>GRANTS/PROJECTS:</b>			
Arizona Biomedical Research Center (CTSA) <sup>1</sup>	-	250,000	4,849,224
Projects to be determined <sup>2</sup>	2,934,048	-	
Subtotal Grants/Projects	<b>2,934,048</b>	<b>250,000</b>	<b>4,849,224</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 2,934,048</b>	<b>\$ 250,000</b>	<b>\$ 4,849,224</b>

<sup>1</sup> \$250,000 was allocated to the Arizona Biomedical Research Commission (ABRC) on June 30, 2007, to engage Battelle Technology Partnership Practice to assist in development of the Arizona statewide application for an NIH Clinical and Translational Science Award (CTSA). Funds will be expended by ABRC in FY 2008.

<sup>2</sup> Proposals are currently being received from the universities. Funds will be allocated upon proposal review and approval by ABOR (Fall 2007).

**ABOR CENTRAL OFFICE**  
**TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)**  
 FY 2007 ACTUAL / FY 2008 BUDGET  
**ARIZONA REGENTS REACH OUT (ARRO) GRANTS**  
 Summary

	<i>FY 2007 REV BUDGET</i>	<i>FY 2007 ACTUAL</i>	<i>FY 2008 BUDGET</i>
<b>REVENUE</b>			
Carry Forward	\$ 391,303	\$ 391,303	\$ 319,150
TRIF Revenue	482,116	482,116	600,000
<b>TOTAL REVENUE</b>	<b>\$ 873,419</b>	<b>\$ 873,419</b>	<b>\$ 919,150</b>
<b>EXPENDITURES</b>			
<b>OPERATING BUDGET</b>			
Personal Services	\$ 36,284	\$ 89,275	\$ 69,498
ERE	9,781	25,719	17,374
All Other Operating	64,800	625	13,128
Subtotal Operating Budget	<b>110,865</b>	<b>115,619</b>	<b>100,000</b>
<b>GRANTS/PROJECTS:</b>			
FY 2008 Grants			500,000
FY 2007 Grants	500,000	244,930	255,070
FY 2006 Grants	262,554	198,474	64,080
Subtotal Grants/Projects	<b>762,554</b>	<b>443,404</b>	<b>819,150</b>
<b>EXPENDITURES GRAND TOTAL</b>	<b>\$ 873,419</b>	<b>\$ 559,023</b>	<b>\$ 919,150</b>

## PROGRAM OVERVIEW:

The Arizona Regents Reach Out (ARRO) grant program was first authorized in spring 2005 and issued its first grant awards the following November. Currently, \$500,000 is set aside for ARRO awards to support innovative e-learning, distance-learning projects from faculty and staff at all three universities, with an emphasis on projects that are collaborative, support workforce development, and are transferable, portable, shareable, and scalable.

**Update on 2006 Grant Program:** In the initial 2006 funding round, 60 proposals were submitted. Of these, 9 were approved for funding from ARRO. These projects began on January 1, 2006, and concluded on July 31, 2007. Final activity reports from all grantees are due by August 31, and final expenditure reports are due September 30. The final activity reports will include end-of-project counts of the 2006 program deliverables, including:

- Number of courses developed
- Number of course enhancements
- Number of students enrolled
- Curriculum innovations
- Partnerships and collaborations
- Number of students affected
- Number of faculty and peers affected

**Status of 2007 Grant Program:** 2007 marked the second annual funding round for the Arizona Regents Reach Out (ARRO) grant program. For 2007, the overall program goals and objectives of ARRO funding remained essentially unchanged from the previous year. Proposers were asked to submit proposals for projects that:

- Promote educational merit and feasibility and demonstrate collaborative elements of the proposal and its benefit to the Arizona higher education environment;
- Promote rapid development of high quality online, distance learning, or technology assisted projects;
- Meet a demonstrated demand or need in Arizona;
- Are transferable, portable, shareable, and scalable;
- Are in short supply but needed for graduation;
- Involve a collaboration, matching, and/or leverage funds on project offerings with other partners;
- Apply existing innovations in new areas;
- Explore opportunities for competency or performance based assessment;
- Are programs as contrasted to individual courses only;

- Have not been previously funded by Arizona Regents University (ARU), Arizona Universities Network (AZUN), or Arizona Regents Reach Out (ARRO); and,
- Utilize inter- or intra-institutional collaboration.

In order to provide a more robust and diverse review process, this year the size of the peer review team was doubled, to include two representatives from each of the three universities. The review team read 18 proposals with a total request for funding of \$820,413. Ultimately, nine of the proposals were approved for funding at a total of \$489,860. Projects began on January 1, 2007, and will end July 31, 2008.

A summary of the 2007 projects follows.

**FY 2007 ARRO GRANTS**

Institution/Department	Project Title	Approved Funding	Project Summary
UA Dept. of Materials Science & Engineering <b>Partners:</b> NAU Imaging and Histology Core Facility; Hitachi, Motorola; Renishaw	On-Demand Remote Access to Electron Microscopes for Bio and Nanotechnology Courses	\$87,391	This collaborative program leverages existing technology by providing students in eight nanotechnology-related courses at UA and two NAU biology courses with on-demand remote access to the multi-million dollar Electron Microscope Facility of the UA Materials Science and Engineering Department. Scanning electronic microscopy and X-ray analysis are standard tools in the nanotechnology world, but student access to them is limited by the high cost and limited number of instruments. The proposed software installation allows students to view state-of-the-art microscopes and acquire data in real time over the Internet from any remote location.
UA Special Education, Rehabilitation, and School Psychology <b>Partners:</b> Arizona Office of Exceptional Student Services	Initiating a Distance-Learning Program to Prepare Teachers of Deaf and Hard-of-Hearing Children	\$50,000	This project will reconfigure UA's program for teachers of deaf and hard-of-hearing children from a campus-based to an Internet-based curriculum. Since 1980, the UA has offered Arizona's only teacher preparation program in education of deaf and hard-of-hearing children. Converting the program's five core courses to Internet-based format will allow teachers to receive training and be placed in communities where demand is growing, especially Phoenix, Flagstaff, Yuma, and throughout rural Arizona.
UA Dept. of Spanish and Portuguese	On-Line Translator Education Project	\$32,700	This project would jump-start an on-line translation education program to provide working professionals and students throughout Arizona with better access to translator education and employment opportunities. An on-line translator education program would help address the growing demand for highly-skilled translators in an increasingly bilingual society. A medical translation course, to be offered for university credit to students throughout Arizona, will serve as a pilot and revenue generator for the development of an on-line translation certificate. This certificate can include other areas of specialization, such as legal translation, business, financial and technical translation.
UA Radiation Oncology	Development of an Accredited Medical Physics Educational Program	\$47,603	This project will develop a complete Accredited Medical Physics Educational Program, including a graduate program and a residency. The American Board of Radiology plans to require that all certified medical physicists receive a degree from an accredited medical physics program. Currently, over 200 medical physicists are needed in North America each year, but only 40 to 50 are trained in accredited programs. Creating this program will help make the UA a leader in medical physics, building on UA's existing medical education infrastructure.
UA Dept. of Emergency Medicine	Project LEADER: Allocation in Disasters of Emergency Resources	\$49,406	Project LEADER will develop an online and live educational program to train students, healthcare leaders, and leaders in disaster situations how to ethically allocate scarce resources during and after disasters, an aspect of disaster preparedness that has up until now been ignored. The program will address difficult allocation decisions in all types of disasters and at the on-scene, multi-casualty incident, at the institutional, local, regional, and statewide levels. The program will include five modules developed by a

Institution/Department	Project Title	Approved Funding	Project Summary
NAU Construction Management <b>Partner:</b> ASU Del E. Webb School of Construction	Collaborating to Complete the Course Suite for On-Line Delivery of an Existing Master's Degree in Construction Management	\$99,135	national leader in educational media and be distributed through established UA preparedness training programs.  According to the U.S. Bureau of Labor Statistics, the demand will continue to grow for highly-educated construction professionals with advanced education. Together, courses at the Del E. Webb School of Construction at ASU and the Construction Management Department at NAU comprise nearly a full suite of on-line courses to support an on-line Master of Science in Construction. With ARRO funding, the partnering institutions will develop, produce, and deploy the high-quality on-line coursework leading to a Master of Science Degree in Construction. The partners expect to enroll at least 100 students within the first three years of offering this on-line degree program.
NAU English Dept. <b>Partners:</b> UA English Dept.; ASU English Dept. Univ. of Sheffield (UK)	Current Shakespeare Scholarship and the Secondary Classroom	\$66,203	The English Departments at NAU, ASU and UA would partner with the University of Sheffield (United Kingdom) to create a website with 150 lesson plans based on cutting-edge Shakespeare scholarship. The website will include copies of recent "crucially important" articles and will be illuminated in a specially made DVD by 20-minute interviews with noted Shakespeare scholars from the participating universities. The website and interviews will support online and face-to-face classes for Arizona English education students and practicing teachers in graduate classes and will be available free to anyone globally.
UA Family Studies and Human Development	Project REACH: Reaching Out and Expanding Access to Coursework in Human Development	\$49,274	This project will develop online versions of three lower-division, foundational courses in UA's Family Studies and Human Development Department. All three courses typically have very high enrollment from both majors and non-majors. Converting these courses to on-line format will eliminate the problem of limited access for UA students. Through the Cooperative Extension network, these "anytime-anyplace" courses can also be made available throughout the state (especially in rural areas) to early childhood practitioners seeking to upgrade their qualifications to meet state requirements; to Family Life Centers on military bases in the state; and to Native American communities of Arizona.
NAU School of Music	Self-Paced Competency-Based Music History Tutorial for Graduate Students	\$8,148	This project would develop a non-credit, on-line music history tutorial for all graduate students entering the School of Music at NAU. Most students arrive at NAU well-prepared for advanced study in their specialized field but with serious deficiencies in academic areas -- in particular, music history and music theory. Requiring a self-paced on-line tutorial before beginning the first semester of graduate school will allow students to identify and correct their deficiencies and prepare for more advanced work, without the risk of delaying graduation. This tutorial would shift the focus from remediation to academic advancement and professionalization of our students.
<b>TOTAL FUNDING:</b>		<b>\$489,860</b>	

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## APPENDIX

### Arizona Board of Regents Policy 3-412

Policy Number: 3-412	Policy Name: Administration of Technology and Research Initiative Fund
Policy Revision Dates: 3/01	Page 1

### 3-412 Administration of Technology and Research Initiative Fund

#### A. Authority

As authorized by Proposition 301 approved by the voters in November 2000, the Board shall establish and administer a technology and research initiative fund (TRIF), beginning July 1, 2001. The TRIF will consist of sales tax revenues generated through Proposition 301 and other private or public sources of funding which are received by the Board for purposes which are consistent with the proposed uses described herein.

#### B. Funding Criteria

The TRIF will be used to support projects and initiatives that meet one or more of the following criteria:

1. Promote university research, development and technology transfer related to the knowledge based global economy;
2. Expand access to baccalaureate or post-baccalaureate education for time-bound and place-bound students;
3. Implement final recommendations from the Governor's Task Force on Higher Education and/or the Arizona Partnership for the New Economy.
4. Develop programs that will prepare students to contribute in high technology industries located in Arizona.

#### C. Calendar and Guidelines

The Board shall establish an annual calendar for the allocation of Proposition 301 funding, including guidelines for the submission and evaluation of proposals, and final decisions by the Board. The calendar will incorporate a process to receive and consider input from the Arizona Partnership for the New Economy (APNE) or a successor agency as may be designated by the Governor.

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#### D. Formats for Submission of Proposals

Funding requests shall be submitted by the university Presidents, or prepared by the Central Office on behalf of the Board, in a format to be approved by the Executive Director, to include the following elements: A description of the proposed need, purpose and goals for each proposed project or activity, an explanation as to the ways in which the project promotes the purposes of the legislation, and/or an explanation of the relationship of the proposed project or activity to the foundation or clusters which are part of the state's overall economic development program;

1. The requested duration of the proposed project or activity;
2. Proposed detailed performance measures, desired outcomes, and proposed methodology for evaluating progress in attaining the desired outcomes; and
3. A detailed budget for each proposed project or activity, including the identification of funds which are intended to be either continuing, multi-year, or one time only.

#### E. Special Factors

The Board shall take into account several additional factors in determining its allocations from this fund:

1. Priority shall be given to proposals that involve collaboration between and among the universities and/or collaboration with private industry or public sector agencies.
2. The Board may authorize awards for an annual or multi-year basis, but in no event will the Board make an award on a multi-year basis without incorporating specific requirements regarding periodic review and assessment or progress in implementing the proposed project or activity and in attaining the desired outcomes.
3. Funding may be used to pay salaries only for persons directly involved in projects or activities funded under this program that would otherwise not be funded through general fund appropriations.

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4. The Board may allocate up to 20% of annual funding for capital projects relating to new economy initiatives, including the payment of debt service; capital projects must be clearly identified with each university's submission of proposals.
5. The Board will honor the legislative intent as described in Proposition 301 that a portion of the revenues in the fund shall be allocated on an annual basis to pay Certificates of Participation costs for lease-purchase of buildings and associated infrastructure at ASU East and West campuses.

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