TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
ANNUAL REPORT

ARIZONA BOARD OF REGENTS

Arizona State University
Northern Arizona University
The University of Arizona

For the fiscal year ended June 30, 2009,

as required by A.R.S. §15-1648(D).

September 1, 2009

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

For the Fiscal Year Ended June 30, 2009

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

September 1, 2009

Governor Jan Brewer
Senate President Robert "Bob" Burns
Speaker of the House of Representatives Kirk Adams
Arizona State Capitol
1700 West Washington Street
Phoenix, AZ 85007

Dear Governor Brewer, President Burns, and Speaker Adams:

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, 2009. 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 use of 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.

The FY 2009 TRIF budget supported significant research projects in the biosciences and biotechnology; optical sciences; sustainability, including water, solar energy, and forest health; and information science and technology, all critical to the future economic development of the state of Arizona. Workforce development projects were also funded, including support for The University of Arizona College of Medicine-Phoenix, in

partnership with Arizona State University, as well as preparation of math and science teachers and health care workers. The Arizona University System's efforts to provide access to more Arizonans were supported through TRIF funding for the Arizona Universities Network (AZUN), the NAU-Yuma campus, and expansion of the NAU Statewide Program.

TRIF-funded research projects, especially those focusing on solar energy, alternative fuels, and climate change, have laid the foundation for Arizona State University, Northern Arizona University, and The University of Arizona to be successful in winning major grants from the NSF, NASA, the Department of Energy, NIH, and other government agencies who are now distributing significant amounts of federal stimulus funds through a highly competitive application process.

All TRIF-funded 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

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@azregents.edu if I can answer any questions or provide additional information.

Sincerely,

Joel Sideman
Executive Director

c: The Honorable Ken Bennett, Secretary of State
Ms. GladysAnn Wells, Director and State Librarian, 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, 2009

EXECUTIVE SUMMARY

- Education 2000 (Proposition 301), passed by Arizona voters in November 2000, approved a six-tenths-cent increase in the state sales tax to be dedicated to K-12, the community colleges, and the universities. Pursuant to A.R.S. §§42-5010, 42-5029, and 42-5155, collection of the tax began on June 1, 2001, and will continue through June 30, 2021.

- 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, 2009, $466.1 million 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."

- The FY 2009 TRIF budget supported significant research projects at Arizona State University, Northern Arizona University, and The University of Arizona in the biosciences and biotechnology; optical sciences; sustainability, including water, solar energy, and forest health; and information science and technology, all critical to the future economic development of the state of Arizona. Workforce development projects were also funded, including support for The University of Arizona College of Medicine-Phoenix, in partnership with Arizona State University, as well as preparation of math and science teachers and health care workers. The Arizona University System's efforts to provide access to more Arizonans were supported through TRIF funding for the Arizona Universities Network (AZUN), the NAU-Yuma campus, and expansion of the NAU Statewide Program.

- 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 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 2009 totaled $59.2 million. This amount is 15.3% below prior-year revenue and 20.5% below projected revenue for FY 2009. This significant revenue shortfall due to the downturn in the national and Arizona economies necessitated careful cash flow management of TRIF funds by the universities and ABOR central office in order to maintain core projects.

- Actual TRIF expenditures in FY 2009 totaled $69.8 million, representing 84.9% 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.

- 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 2009.

- TRIF budget guidelines adopted by the Board call for full expenditure of FY 2009 funds by December 31, 2009. The universities and central office may then request that any unexpended funds be reallocated for the same or a different use.

- Expenditure detail by university and central office and by initiative is presented in this report. TRIF project brochures present 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 2009, 10% of TRIF expenditures were for capital projects.

- This FY 2009 TRIF Annual Report is available on the Arizona Board of Regents website at: www.azregents.edu

ARIZONA UNIVERSITY SYSTEM

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 - 2011 BUDGETS

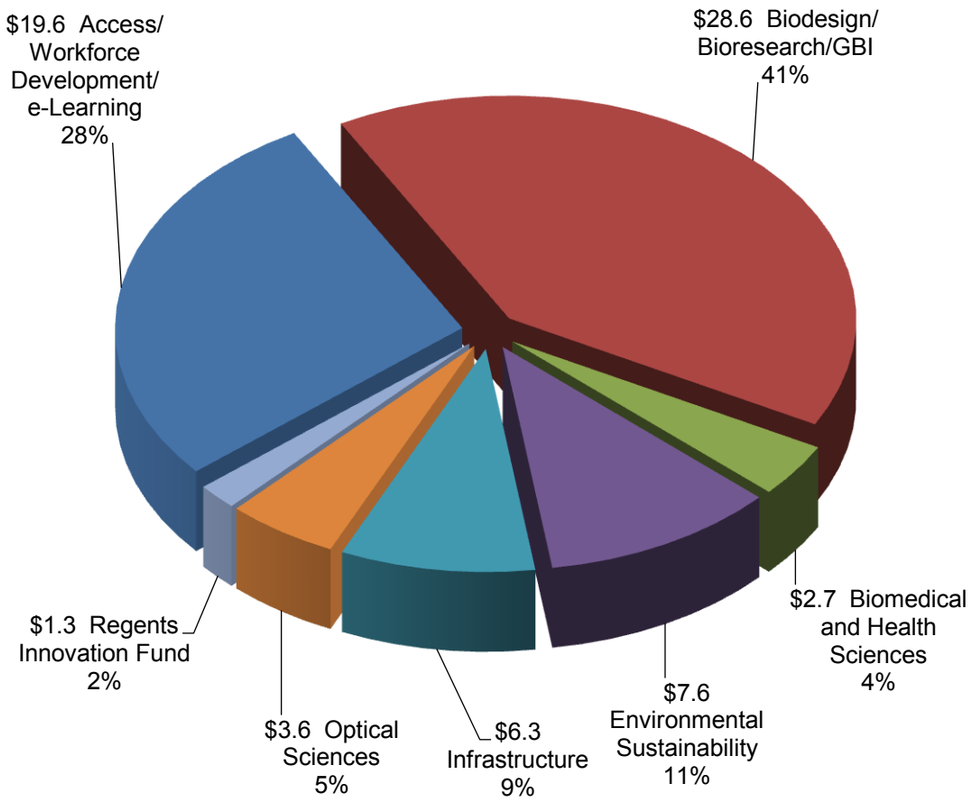
SUMMARY

	FY 2007 ACTUAL	*FY 2008 ACTUAL*	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE						
Carryforward	$ 32,465,192	$ 26,345,536	$ 22,804,167	$ 23,122,947	$ 12,328,155	$ 32,810
TRIF Revenue	71,922,360	71,482,244	71,168,054	59,152,825	55,500,047	55,500,008
TOTAL REVENUE	**$ 104,387,552**	**$ 97,827,780**	**$ 93,972,221**	**$ 82,275,772**	**$ 67,828,202**	**$ 55,532,818**
EXPENDITURES						
OPERATING BUDGET						
Personal Services	$ 28,331,875	$ 29,784,071	$ 40,672,573	$ 29,316,187	$ 27,554,784	$ 23,263,440
ERE	7,838,610	8,508,401	11,833,279	8,706,612	7,734,492	6,527,425
All Other Operating	23,199,744	25,496,094	23,584,799	20,204,528	18,303,386	11,552,168
Grants/Projects	1,812,640	1,702,337	2,505,596	1,271,151	1,713,844	1,700,000
TOTAL OPERATING BUDGET	**61,182,869**	**65,490,903**	**78,596,247**	**59,498,478**	**55,306,506**	**43,043,033**
CAPITAL BUDGET						
Building Renovation	209,107	347,337	2,274,400	147,127	2,670,700	2,670,700
Debt Service	8,333,939	4,990,248	9,324,853	6,447,274	6,103,386	6,100,485
ASU Polytechnic/West COPs	3,650,200	3,721,800	3,748,800	3,718,800	3,714,800	3,718,600
NAU Conference Center	4,071,491	162,830	-	-	-	-
TOTAL CAPITAL BUDGET	**16,264,737**	**9,222,215**	**15,348,053**	**10,313,201**	**12,488,886**	**12,489,785**
EXPENDITURES GRAND TOTAL	**$ 77,447,606**	**$ 74,713,118**	**$ 93,944,300**	**$ 69,811,679**	**$ 67,795,392**	**$ 55,532,818**
SUMMARY BY PROGRAM AREA						
Access/Workforce Development/e-Learning	$ 21,415,578	$ 23,459,012	$ 27,681,782	$ 19,584,037	$ 20,472,088	$ 14,517,931
Biodesign/Bioresearch/GBI	34,530,399	32,014,984	35,839,539	28,569,932	25,016,345	22,420,346
Biomedical and Health Sciences	1,199,372	2,345,392	3,958,436	2,728,263	27,921	-
Environmental Sustainability	5,440,997	7,168,311	10,794,192	7,639,264	8,373,051	7,634,206
Infrastructure	10,408,324	4,949,959	9,415,929	6,330,618	9,361,371	6,404,290
Optical Sciences	3,187,607	3,340,957	4,328,463	3,642,702	2,584,031	2,656,045
Advanced Materials	-	-	-	-	400,000	400,000
Regents Innovation Fund	1,265,329	1,434,503	1,925,959	1,316,863	1,560,585	1,500,000
EXPENDITURES GRAND TOTAL	**$ 77,447,606**	**$ 74,713,118**	**$ 93,944,300**	**$ 69,811,679**	**$ 67,795,392**	**$ 55,532,818**

ARIZONA UNIVERSITY SYSTEM
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2009 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA

	FY 2009 REVISED BUDGET	*FY 2009 ACTUAL*
REVENUE		
Carryforward	$ 22,804,167	$ 23,122,947
TRIF Revenue	71,168,054	59,152,825
TOTAL REVENUE	**$ 93,972,221**	**$ 82,275,772**
EXPENDITURES		
OPERATING BUDGET		
Personal Services	$ 40,672,573	$ 29,316,187
ERE	11,833,279	8,706,612
All Other Operating	23,584,799	20,204,528
Grants/Projects	2,505,596	1,271,151
TOTAL OPERATING BUDGET	**78,596,247**	**59,498,478**
CAPITAL BUDGET		
Building Renovation	2,274,400	147,127
Debt Service	9,324,853	6,447,274
ASU Polytechnic/West COPs	3,748,800	3,718,800
NAU Conference Center	-	-
TOTAL CAPITAL BUDGET	**15,348,053**	**10,313,201**
EXPENDITURES GRAND TOTAL	**$ 93,944,300**	**$ 69,811,679**
SUMMARY BY PROGRAM AREA		
Access/Workforce Development/e-Learning	$ 27,681,782	$ 19,584,037
Biodesign/Bioresearch/GBI	35,839,539	28,569,932
Biomedical and Health Sciences	3,958,436	2,728,263
Environmental Sustainability	10,794,192	7,639,264
Infrastructure	9,415,929	6,330,618
Optical Sciences	4,328,463	3,642,702
Regents Innovation Fund	1,925,959	1,316,863
EXPENDITURES GRAND TOTAL	**$ 93,944,300**	**$ 69,811,679**

FY 2009 SYSTEM ACTUAL TRIF EXPENDITURES
(in millions)



ARIZONA UNIVERSITY SYSTEM

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET *CAPITAL* EXPENDITURES

($ in thousands)

	TRIF INITIATIVE	FY 2009 Budget	FY 2009 Actual	FY 2010 Budget
ASU	*Biodesign Institute at ASU*	**$3,024**	**$1,112**	**$0**
	ASU Poly/West Certificates of Participation (COPs) *****	**n/a**	**n/a**	**n/a**
	Solar Energy	**$28**	**$35**	**$0**
	Biosciences Initiative	**-**	**-**	**$3,211**
	Sustainability Initiative	**-**	**-**	**$380**
	Advanced Materials Initiative	**-**	**-**	**$80**
	Total Capital Expenditures	**$3,052**	**$1,147**	**$3,671**
	Capital as % of Total ASU Expenditures	**9.9%**	**4.9%**	**17.8%**
NAU	*Arizona Universities Network (AZUN)*	$500	$500	$500
	University Initiatives	$3,303	$1,504	$1,603
	Total Capital Expenditures	**$3,803**	**$2,004**	**$2,103**
	Capital as % of Total NAU Expenditures	**16.9%**	**14.1%**	**10.6%**
UA	*Bioresearch Program*	$0	$5	$0
	Water and Environmental Sustainability Program	$0	-$5	$0
	Education and Infrastructure Program	$4,744	$3,443	$3,000
	Total Capital Expenditures	**$4,744**	**$3,443**	**$3,000**
	Capital as % of Total UA Expenditures	**13.9%**	**12.2%**	**14.0%**
ABOR	**Total Capital Expenditures**	**$0**	**$0**	**$0**
	Capital as % of Total ABOR Expenditures	**0.0%**	**0.0%**	**0.0%**
Total System Capital Expenditures		**$11,599**	**$6,594**	**$8,774**
20% Statutory Limit on Capital Expenditures		**$18,039**	**$13,219**	**$12,816**
Capital Expenditures as % of Total System Expenditures		**12.9%**	**10.0%**	**13.7%**

* Not applicable. TRIF allocations for ASU Polytechnic and ASU West debt service (FY 2009 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 2009 ACTUAL / FY 2010 - 2011 BUDGETS

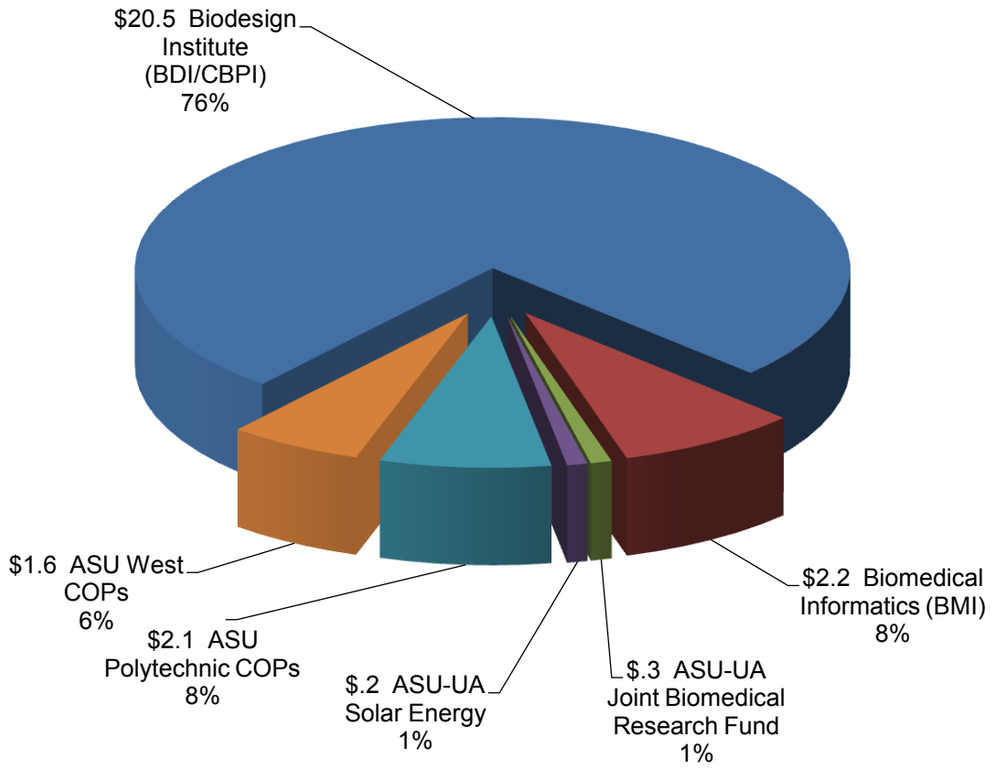
SUMMARY

	FY 2007 ACTUAL	*FY 2008 ACTUAL*	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE						
Carryforward	$ 11,111,300	$ 5,872,900	$ 5,610,100	$ 5,601,400	$ 2,071,300	$ -
TRIF Revenue	27,041,400	27,886,700	28,895,000	23,422,500	22,237,900	22,229,500
TOTAL REVENUE	**$ 38,152,700**	**$ 33,759,600**	**$ 34,505,100**	**$ 29,023,900**	**$ 24,309,200**	**$ 22,229,500**
EXPENDITURES						
OPERATING BUDGET						
Personal Services	$ 13,276,700	$ 11,615,800	$ 14,620,700	$ 11,597,000	$ 8,631,100	$ 7,568,500
ERE	3,368,900	3,008,600	3,931,800	3,143,500	2,030,800	1,780,800
All Other Operating	11,166,300	8,892,500	9,151,800	7,346,100	6,261,800	5,490,900
TOTAL OPERATING BUDGET	**27,811,900**	**23,516,900**	**27,704,300**	**22,086,600**	**16,923,700**	**14,840,200**
CAPITAL BUDGET						
Building Renovation	40,100	133,300	2,274,400	147,100	2,670,700	2,670,700
Debt Service	777,600	777,600	777,600	1,000,000	1,000,000	1,000,000
COPs Lease Purchase Payment	3,650,200	3,721,800	3,748,800	3,718,800	3,714,800	3,718,600
TOTAL CAPITAL BUDGET	**4,467,900**	**4,632,700**	**6,800,800**	**4,865,900**	**7,385,500**	**7,389,300**
EXPENDITURES GRAND TOTAL	**$ 32,279,800**	**$ 28,149,600**	**$ 34,505,100**	**$ 26,952,500**	**$ 24,309,200**	**$ 22,229,500**
SUMMARY BY INITIATIVE						
Biodesign Institute (BDI/CBPI)	$ 27,734,500	$ 22,354,500	$ 25,721,500	$ 20,505,500	$ -	$ -
Biomedical Informatics (BMI)	551,200	446,400	3,005,600	2,221,000	-	-
ASU-UA Joint Biomedical Research Fund	210,700	858,100	431,200	258,500	-	-
Planning for Phoenix Biomedical Campus	133,200	616,800	-	-	-	-
ASU-UA Solar Energy	-	152,000	1,598,000	248,700	-	-
Biosciences	-	-	-	-	18,294,400	16,210,900
Advanced Materials	-	-	-	-	400,000	400,000
Sustainability	-	-	-	-	1,900,000	1,900,000
ASU Polytechnic COPs	2,046,100	2,082,800	2,084,200	2,084,200	2,083,800	2,081,600
ASU West COPs	1,604,100	1,639,000	1,664,600	1,634,600	1,631,000	1,637,000
EXPENDITURES GRAND TOTAL	**$ 32,279,800**	**$ 28,149,600**	**$ 34,505,100**	**$ 26,952,500**	**$ 24,309,200**	**$ 22,229,500**

ARIZONA STATE UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2009 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA

	FY 2009 REVISED BUDGET	*FY 2009 ACTUAL*
REVENUE		
Carryforward	$ 5,610,100	$ 5,601,400
TRIF Revenue	28,895,000	23,422,500
TOTAL REVENUE	**$ 34,505,100**	**$ 29,023,900**
EXPENDITURES		
OPERATING BUDGET		
Personal Services	$ 14,620,700	$ 11,597,000
ERE	3,931,800	3,143,500
All Other Operating	9,151,800	7,346,100
TOTAL OPERATING BUDGET	**27,704,300**	**22,086,600**
CAPITAL BUDGET		
Building Renovation	2,274,400	147,100
Debt Service	777,600	1,000,000
COPs Lease Purchase Payment	3,748,800	3,718,800
TOTAL CAPITAL BUDGET	**6,800,800**	**4,865,900**
EXPENDITURES GRAND TOTAL	**$ 34,505,100**	**$ 26,952,500**
SUMMARY BY INITIATIVE		
Biodesign Institute (BDI/CBPI)	$ 25,721,500	$ 20,505,500
Biomedical Informatics (BMI)	3,005,600	2,221,000
ASU-UA Joint Biomedical Research Fund	431,200	258,500
Planning for Phoenix Biomedical Campus	-	-
ASU-UA Solar Energy	1,598,000	248,700
Biosciences	-	-
Advanced Materials	-	-
Sustainability	-	-
ASU Polytechnic COPs	2,084,200	2,084,200
ASU West COPs	1,664,600	1,634,600
EXPENDITURES GRAND TOTAL	**$ 34,505,100**	**$ 26,952,500**

FY 2009 ASU ACTUAL TRIF EXPENDITURES
(in millions)



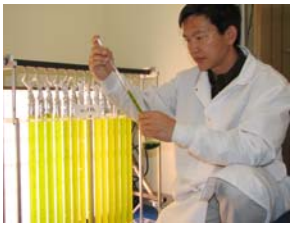
ARIZONA STATE UNIVERSITY

REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2009

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

ASU TRIF PROGRAM

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



ASU scientists research alternative sources of fuel that are economically feasible and good for our planet.

At the January 2009 Board of Regents meeting, ASU presented its plan to restructure the TRIF investments to reflect the reduction in available funding and increase the impact and leveraging of these funds. This process assessed the potential for incentivizing research to increase the return in terms of funding, work force development, and economic impact. This analysis of research funding, industry collaboration, and economic impact opportunities, including the potential to attract significant investments through the American Recovery and Reinvestment Act (ARRA), led to consolidation of the proposed targeted research areas into four themes:

BioSciences — includes investments in biological, clinical and health sciences. The Biodesign Institute (BDI) leads this effort and is ASU's flagship TRIF initiative, focused on use-inspired, collaborative research that improves 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).

Advanced Materials — an emerging coalition of researchers in flexible electronics, nanotechnologies, biomaterials, chemistry, and physics that creates breakthrough new products, materials, and technologies.

Sustainability — focuses on understanding the interrelationships of growth and urban development with environmental, economic, and social systems, storage and transmission of power, and developing renewable energy technologies to reduce the impact on our planet.

Discovery/Exploration/Education — focuses on multidisciplinary cross-cutting approaches that positions ASU for attracting investments in new research areas (such as astrobiology), and capacity building projects in information technology and communications, education, and entrepreneurship. The planning and reporting of this effort is included under the flagship Biosciences initiative.

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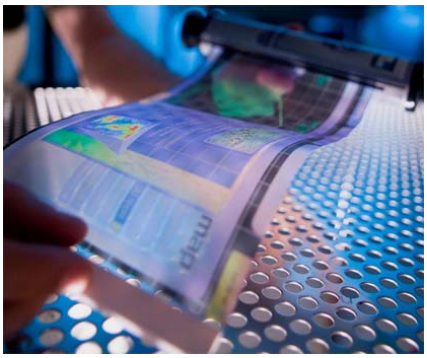
Dr. Rick Shangraw
Vice President for Research and Economic Affairs

September 1, 2009

The Decision Theater at ASU develops and deploys cutting-edge decision support tools to model scenarios of complex systems.



Prototype easy-to-manufacture, low-power-consumption Flexible Display developed at ASU.

The strategic investments in emerging areas of advanced materials and sustainability leverages the intellectual strengths of our faculty and collaborations with industry positioning us to attract significant federal and industry funding resulting in a high economic impact. The capacity building projects in information technology and communications, education, and technology transfer are not only significant in terms of their economic and societal impacts but also ensures the success of the Biosciences, Advanced Materials, and the Sustainability initiatives.

During FY 2007–FY 2009, TRIF supported the Joint ASU-UA Biomedical Research Fund from combined ASU-UA TRIF resources to advance collaborative biomedical projects.

Beginning in FY 2008, TRIF funded a joint ASU-UA initiative in Solar Energy. ASU established the Solar Power Laboratory (SPL) to manage and direct the Solar Energy Initiative. The mission of SPL is to advance the science, innovation, development, education, and training in solar power utilization to provide abundant, clean, sustainable power to Arizona. ASU is unique in its integrated science-to-commercialization-to-policy structure, which is particularly critical to successful transfer of research breakthroughs in the renewable energy field.

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.

Consolidated Performance analysis

ASU tracks and monitors performance and return on investment (ROI) for each TRIF focus area, including: external research funding and expenditures; intellectual property generated and technology transfer; work force development; partnerships with local business and industry; curriculum development (to improve the effectiveness of our students and reduce the time needed for them to become productive as entrepreneurs and in the workplace); and economic impact on our cities, state, and nation.

The national economic downturn and reduced sales tax revenues resulted in significant mid-year reductions in TRIF funding. Feedback from prior years and changes in leadership led to transitioning TRIF investments in FY 09.

The consolidated performance analysis reflects budget reductions of approximately $12 million in TRIF funding over FY 09–FY 10 period to accommodate the decreasing funding available for investment. Implementation of the reorganization plan allowed ASU to reduce FY 09 by $5.0M and FY 10 by $7.0M, for a total reduction of $12M over FY 09 and FY 10.

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.

ASU Consolidated PERFORMANCE MEASURES/DELIVERABLES	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
Biosciences (Incl Capacity Building Project Investments)													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards												58.80	67.60
Royalty income												0.00	0.00
Foundation funding												0.50	0.50
Return Total												59.30	68.10
Technology Transfer													
New invention disclosures												150	151
New patent applications filed												160	162
New patents issued												21	21
Total start-up companies licensing ASU technology												4	4
Licenses or options signed (as indication of technology adoption by industry)												33	34
Work Force Contributions													
Post-doctoral appointments												81	93
Post-doctoral researchers leaving to enter the workforce												12	13
Graduate students employed												253	278
Graduate students earning degrees and entering the workforce												45	47
Undergraduate students involved												214	225
Partnerships/Collaborations													
The number of research grants/contracts involving funding from non-government entities												35	39
The number of research grants/contracts involving subcontracts to non-ASU researchers												6	8
Sustainability													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards												32.20	40.00
Royalty income												0.10	0.30
Foundation funding												1.50	2.50
Return Total												33.80	42.80
Work Force Contributions													
Post-doctoral appointments												29	35
Post-doctoral researchers leaving to enter the workforce												13	18
Graduate students employed												114	142
Graduate students earning degrees and entering the workforce												43	60
Undergraduate students involved												77	87
Partnerships/Collaborations													
The number of research grants/contracts involving funding from non-government entities												24	33
The number of research grants/contracts involving subcontracts to non-ASU researchers												21	27
Advanced Electronic Materials													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards												31.20	27.60
Royalty income												0.02	0.05
Foundation funding												0.04	0.04
Return Total												31.26	27.69
Work Force Contributions													
Post-doctoral appointments												20	23
Post-doctoral researchers leaving to enter the workforce												10	14
Graduate students employed												7	4
Graduate students earning degrees and entering the workforce												3	4
Undergraduate students involved												4	6
Partnerships/Collaborations													
The number of research grants/contracts involving funding from non-government entities												8	6
The number of research grants/contracts involving subcontracts to non-ASU researchers												3	5
Biodesign Institute and Capacity Building Project Investments													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards	11.92	8.63	27.09	35.88	47.00	51.60	52.09	56.76	80.88	62.44	50.60		
Royalty income						0.50	0.48	0.52	1.05	0.55	0.36		
Foundation funding						0.47	0.57	0.50	10.70	0.52	8.40		
Return Total						52.57	53.14	57.78	92.63	63.50	59.36		
Value of new startups to ASU	.05	.09	1.40	2.53	3.8								
New products in marketplace	5	3	5	10	7								
Value of new products to ASU	.42	.40	1.40	2.53	3.8								
Technology Transfer													
New invention disclosures	97	91	98	166	152	145	158	147	145	148	151		
New patent applications filed	108	106	128	168	82	156	140	157	83	159	184		
New patents issued	11	17	18	41	22	20	15	20	12	21	23		
Total start-up companies licensing ASU technology	3	3	4	4	4	4	7	4	0	4	5		
Licenses or options signed (as indication of technology adoption by industry)	9	20	24	28	32	32	22	33	43	33	25		
New software packages distributed	-	6	10	2	N/A								
Form industry-university nationwide research consortium	-	In Progress	4	2	N/A								
Create research road map in collaboration with industry	In Progress	Completed	4	1	N/A								
Fund proof of concept grants to faculty	6	6	5	9	6								
Business plans written	2	6	9	8	2								
Technology transfer portal inquiries from industry	1	13	15	20	27								

-- Insert Page A --

ASU Consolidated *(Continued)* PERFORMANCE MEASURES/DELIVERABLES	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
Biodesign Institute and Capacity Building Project Investments													
Work Force Contributions													
Post-doctoral appointments	5	48	44	64	88	37	56	38	110	38	70		
Post-doctoral researchers leaving to enter the workforce	-	19	24	32	39	26	26	27	53	27	11		
Graduate students employed	29	120	106	121	103	113	324	114	404	115	230		
Graduate students earning degrees and entering the workforce	-	33	67	63	71	75	95	75	136	76	43		
Undergraduate students involved	39	84	139	177	160	172	157	173	645	175	204		
Increase in number of teachers who graduate with math/science certification	9	-	7	(14)	7								
Growth in CS/CSE Graduates	-21	10	37	53	30								
Partnerships/Collaborations													
The number of Biodesign Institute research grants/contracts involving funding from non-government entities						17	25	17	37	17	47		
The number of Biodesign Institute research grants/contracts involving subcontracts to non-ASU researchers						18	35	18	22	18	31		
New research collaborations with industry and national laboratories	9	13	19	14	49								
Curriculum Innovations													
Tier 1 Introduction to Information Technology for all students - Completed FY 2002	Completed												
Tier 2 package of 3 courses	Partially		Partially	Partially	Partially								
Tier 3 concentration for BIS degree		Partially	Partially	Partially	Partially								
BS Applied Computing (ASU West) Begins Fall 2005	Approved				X								
High school students completing software design material	88	227	200	N/A	N/A								
Internships w/ industry	32	88	136	71	50								
New courses introduced (Bio, Info, Nano)	4	6	16	13	5								
Economic Development													
Companies identifying ASU as a factor for relocating or expanding in AZ	2 large	0 large 2 small	1 large 3 small	7 large 3 small	3 large 4 small								
Biomedical Informatics													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards						0.80	1.76	2.00	8.13	2.83	2.20		
Royalty income						0.02	0.00	0.02	0.00	0.03	0.00		
Foundation funding						0.03	0.00	0.04	0.02	0.04	0.00		
Return Total						0.85	1.76	2.06	8.15	2.90	2.20		
Economic Impact													
BMI tenure-track faculty hired by the Department [FTE]						2	2	7	7	11	10		
BMI research faculty hired by the Department [FTE]						3	3	4	2	6	3		
New invention disclosures and patent applications filed						N/A	N/A	3	3	5	2		
Total start-up companies licensing ASU technology						N/A	N/A	N/A	N/A	1	1		
Work Force Contributions													
Graduate students earning concentrations in BMI						10.00	Begin Fall 07	10	13	10	10		
Graduate students earning masters degrees in BMI						N/A	Begin Fall 07	10	0	13	11		
Graduate students earning doctoral degrees in BMI						N/A	N/A	N/A	N/A	5	0		
Undergraduate students earning concentrations in BMI						N/A	N/A	N/A	N/A	N/A	N/A		
Medical students trained in informatics						N/A	N/A	24	24	48	72		
Partnerships/Collaborations													
Number of partnerships with biomedical providers						4	6	8	12	12	12		
Number of partnerships with industry						2	1	4	2	8	4		
Solar Energy													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards								N/A	N/A	4.10	7.30		
Royalty income								N/A	N/A	0.10	0.07		
Foundation funding								N/A	N/A	0.10	0.07		
Return Total								N/A	N/A	4.30	7.43		
Technology Transfer													
New invention disclosures								N/A	0	6	N/A		
New patent applications filed								N/A	0	3	N/A		
New patents issued								N/A	0	2	N/A		
Total start-up companies licensing ASU technology								N/A	0	0	N/A		
Licenses or options signed (as indication of technology adoption by industry)								N/A	0	1	N/A		
Work Force Contributions													
Post-doctoral appointments								N/A	0	2	11		
Post-doctoral researchers leaving to enter the workforce								N/A	0	0	7		
Graduate students employed								N/A	0	10	32		
Graduate students earning degrees and entering the workforce								N/A	0	2	22		
Undergraduate students involved								N/A	0	6	23		
Joint ASU-UA Biomedical Research Fund													
Return on Investment ($ amounts in millions)													
Federal and non-federal awards						N/A	N/A	1.25	0.87	1.25	0.00		
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		
Return Total						0.00	0.00	1.25	0.87	1.25	0.00		

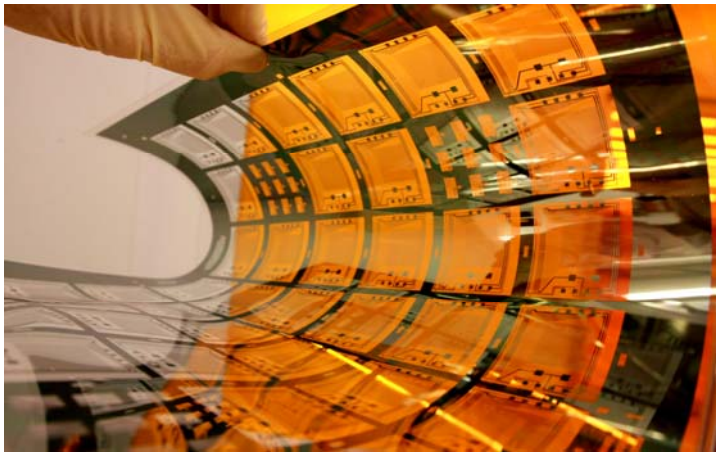
-- Insert Page B --

EXPLANATION OF PERFORMANCE ANALYSIS

- The FY 07–FY 11 **Return on Investment (ROI)** 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 FY 02–FY 06, the return on investment was 1.7:1. FY 02–FY 06 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.
- **Work force Contribution** measures show the impact of TRIF funding and research participation by undergraduate students, graduate students, and post-doctoral appointments in the TRIF Initiatives. The measures also include the number of graduate students and post-doctoral researchers leaving ASU to enter the work force.
- **Partnerships/Collaborations** are an important component for growth of the Biodesign Institute and other TRIF investments. 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 biomedicine, personalized medicine, and other TRIF focus areas.
- **Curriculum Innovations and Economic Development** measures, along with selected measures in the other categories, were used for the first TRIF funding cycle (FY 02–FY 06). For the second funding cycle (FY 07–FY 11), several of these measures were no longer applicable or were replaced with more current and meaningful measures.

FINANCIALS

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Rev Budget	FY09 Actual	FY10 Rev Budget	FY11 Rev Budget
ASU CONSOLIDATED TRIF FINANCIAL SCHEDULE											
Biosciences											
Revenue										$ 18,294,400	$ 16,210,900
Expenditures										18,294,400	16,210,900
Return on Investment										3.2:1	4.2:1
Sustainability											
Revenue										$ 1,900,000	$ 1,900,000
Expenditures										1,900,000	1,900,000
Return on Investment										17.8:1	22.5:1
Advanced Electronic Materials											
Revenue										$ 400,000	$ 400,000
Expenditures										400,000	400,000
Return on Investment										78.1:1	69.2:1
Biodesign Institute & Capacity Building Project Investments											
Revenue	$ 15,217,000	$ 25,242,500	$ 21,220,700	$ 27,210,100	$ 26,555,300	$30,611,700	$24,700,800	$ 25,721,500	$ 22,559,000		
Expenditures	4,825,100	20,134,300	12,703,500	18,854,800	19,764,100	27,734,500	22,354,500	25,721,500	20,505,500		
Return On Investment	2.5:1	0.4:1	2.1:1	1.9:1	2.4:1	1.9:1	4.1:1	2.5:1	2.9:1		
Biomedical Informatics											
Revenue						2,000,000	2,384,600	3,005,600	2,217,400		
Expenditures						551,200	446,400	3,005,600	2,221,000		
Return on Investment						3.2:1	18.2:1	1.0:1	1.0:1		
Solar Energy											
Revenue							1,050,000	1,598,000	248,700		
Expenditures							152,000	1,598,000	248,700		
Return on Investment							N/A	2.7:1	29.9:1		
ASU-UA Joint Biomedical Research Fund											
Revenue						1,000,000	1,255,600	431,200	258,500		
Expenditures						210,700	858,100	431,200	258,500		
Return on Investment						N/A	1.0:1	2.5:1	N/A		
Phoenix Biomedical Campus Planning											
Revenue						750,000	616,800				
Expenditures						133,200	616,800				
Return on Investment						N/A	N/A				
ASU Polytechnic & ASU West Certificates of Participation (COPS)											
Revenue	2,500,000	6,100,000	3,572,000	3,815,800	3,781,700	3,791,000	3,751,800	3,748,800	3,740,200	3,714,800	3,718,600
Expenditures	-	6,128,000	3,356,200	3,708,500	3,790,300	3,650,200	3,721,800	3,748,800	3,718,800	3,714,800	3,718,600
Grand Total											
Revenue	17,717,000	31,342,500	24,792,700	31,025,900	30,337,000	38,152,700	33,759,600	34,505,100	29,023,900	24,309,200	22,229,500
Expenditures	4,825,100	26,262,300	16,059,700	22,563,300	23,554,400	32,279,800	28,149,600	34,505,100	26,952,500	24,309,200	22,229,500



Printable, plastics based flexible display developed by interdisciplinary Advanced Materials researchers at ASU

Goals & Results

ASU has successfully used TRIF funds for strategic investments that have catalyzed research in critical areas, resulting in Arizona in becoming more competitive nationally. The investments have evolved over time to reflect current need and projected opportunity. Every year performance measures and metrics are projected for the investments. This is used to create a transition plan for the initiatives to become self-sustaining over time, thereby making TRIF funds available for new investments.

Goals:

- Increase governmental and private funding in the four research areas: Biosciences; Advanced Materials; Sustainability; and Discovery, Exploration, and Education.
- Leverage TRIF funds to increase competitiveness of research in promising areas to successfully obtain research funds from private and public sources.
- Increase rate of technology transfer and commercial development from biosciences, advanced materials, sustainability and other research investments.
- Enhance interdisciplinary collaborative research in the four research teams.
- Focus on use-inspired research that will result in demonstrable improvements to quality of life and society.
- Train a new generation of scientists and engineers that are facile in emerging areas such as personalized medicine and renewable energy.

Goals & Results (cont.)

Indicative Results:

- FY 09 TRIF related Biodesign and Capacity Building Projects generated $50.6M of federal and non-federal awards.
- The $100M/10-year Army Flexible Display Center leveraged ASU's investment to take new discoveries rapidly to the prototype phase.
- Several research grants were awarded in FY 09 in areas seeded by TRIF funds. A notable research award was the $14 M Department of Energy funded Energy Frontier Research Center (EFRC) for Bio-Inspired Solar Fuel Production.
- ASU is among the top three universities in the United States (along with Stanford and Penn State) in the number of Solar America Initiative R&D Grants for photovoltaics module testing, advanced solar cell materials and next generation photovoltaic devices.
- The first class of students (13) graduated from the Master's degree program in Biomedical Informatics. The BMI program has rapidly grown to 30 Masters and PhD students and provides Informatics instruction to 72 students in the U of A College of Medicine-Phoenix.

Management

Office of the Vice President for Research and Economic Affairs

R.F. "Rick" Shangraw: Vice President for Research and Economic Affairs

Sethuraman Panchanathan: Deputy Vice President for Research and Economic Affairs

Advisory Boards

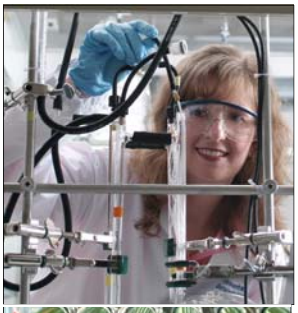
Each of the investment areas is overseen by an external advisory board that includes nationally and internationally renowned industry and academic members to provide an extensive breadth of knowledge, experience and advice to the initiatives.

Learn More

Office of the Vice President for Research and Economic Affairs
480.965.1225

ASU Arizona State University

ARIZONA STATE UNIVERSITY TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)



The Biodesign Institute's research engages diverse capabilities for use-inspired projects. See pg. 4 for examples.

ASU BIODESIGN INSTITUTE
ARIZONA STATE UNIVERSITY

The Biodesign Institute is ASU's flagship TRIF initiative. The hundreds of researchers at the Biodesign Institute are driven by a passion to solve some of the world's most urgent problems affecting human health and the health of our planet.

Today's scientific discoveries are increasingly dependent on large, interdisciplinary teams working together to solve well-defined problems. The Biodesign Institute is committed to:

- improving health care through more personalized diagnostics and treatment;
- providing renewable sources of energy and cleaning our environment; and
- outpacing the global threat of infectious disease.

We focus on translating our research into useful technologies, treatments and solutions. The result is that our research includes such ambitious projects as identifying unique disease signatures to diagnose illness before symptoms appear, using microbiology-based technologies for more sustainable sources of fuel and energy, developing vaccines against the world's most devastating diseases, and creating technologies to more rapidly produce vaccines against emerging pandemics.

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.

BIOSCIENCES

REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2009

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Learn More	4

Dr. Alan Nelson
Executive Director
The Biodesign Institute

ASU

September 1, 2009

PERFORMANCE ANALYSIS

Biosciences PERFORMANCE MEASURES/IMPACT	FY10 Proj	FY11 Proj
Return on Investment ($ amounts in millions)		.
Federal and non-federal awards	58.80	67.60
Royalty income	0.00	0.00
Foundation funding	0.50	0.50
Return Total	59.30	68.10
Technology Transfer		
New invention disclosures	150	151
New patent applications filed	160	162
New patents issued	21	21
Total start-up companies licensing ASU technology	4	4
Licenses or options signed (as indication of technology adoption by industry)	33	34
Work Force Contributions		
Post-doctoral appointments	81	93
Post-doctoral researchers leaving to enter the workforce	12	13
Graduate students employed	253	278
Graduate students earning degrees and entering the workforce	45	47
Undergraduate students involved	214	225
Partnerships/Collaborations		
The number of research grants/contracts involving funding from non-government entities	35	39
The number of research grants/contracts involving subcontracts to non-ASU researchers	6	8

EXPLANATION OF PERFORMANCE ANALYSIS

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.

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.

Research Foci

Center for Applied NanoBioscience
Dr. Frederic Zenhausern
Merges technologies from nanoscience and molecular biology to develop novel sensors and diagnostic tests to monitor health.

Center for BioOptical Nanotechnology
Dr. Neal Woodbury
Integrates biology, chemistry and physics to explore structure and function in biological and biomimetic systems, seeking molecules with desirable functions.

Center for Environmental Biotechnology
Dr. Bruce Rittmann
Focuses on microbiological systems that capture or develop renewable resources or clean up environmental pollution.

Center for Evolutionary Functional Genomics
Dr. Sudhir Kumar
Uses comparative DNA sequence analysis to understand the mechanisms and impact of evolutionary change within and across species and the time scale of those changes.

Virginia G. Piper Center for Personalized Diagnostics
Dr. Joshua LaBaer
Funded by a multimillion gift, the Center for Personalized Diagnostics will pursue improved diagnosis of diseases including lung cancer and diabetes.

Center for Ecogenomics
Dr. Deidre Meldrum
Focuses on genome analysis automation, microscale systems for biological applications, ecogenomics, robotics and control systems.

Center for Infectious Diseases and Vaccinology
Dr. Roy Curtiss
Focuses on host-pathogen interactions and identification of protective antigens to develop new technologies for rapid vaccine production and delivery.

Center for Innovations in Medicine
Dr. Stephen Johnston
Focuses on innovative solutions to major challenges in health care including a vaccine for cancer and pre-symptomatic diagnostics.

Center for Single Molecule Biophysics
Dr. Stuart Lindsay
Focuses on understanding processes on which life is based using the simplest model systems and advancing the tools to work at this scale.

Center for Bioelectronics and Biosensors
Dr. Nongjian Tao
Integrates device and materials functions to develop novel sensors to monitor health and potential hazards.

Center for BioEnergetics
Dr. Sidney Hecht
Research of mitochondrial diseases caused by defects in the body's energy production processes.

Financial Information

Biosciences	FY10 Rev Budget	FY11 Rev Budget
REVENUE		
Carry Forward	$ 2,049,900	
New TRIF Revenue	16,244,500	16,210,900
TOTAL REVENUE	**$18,294,400**	**$16,210,900**
OPERATING BUDGET		
Personal Services	7,692,700	6,630,100
Employee Related Expenses	1,810,000	1,560,000
Operating Expenses	5,581,000	4,810,100
Total Operating Budget	$15,083,700	$13,000,200
CAPITAL BUDGET		
Building Renovation	2,210,700	2,210,700
Debt Service	1,000,000	1,000,000
Total Capital Budget	3,210,700	3,210,700
TOTAL EXPENDITURES	**$18,294,400**	**$16,210,900**
Return On Investment	**3.2:1**	**4.2:1**

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

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 this funding, the goals & results below focus on it. However, other capacity building projects, including the Arizona Institute for Nano-Electronics (AINE), the Decision Theater, Wireless Integrated Nano Technology (WINTech) and the Arizona Institute for Renewable Energy (AIRE) are included in the financial and performance metrics.

Goals:

- Increase governmental and private funding of research at the Biodesign Institute by 15 percent annually
- Increase the rate of technology transfer development from the bioscience / biotechnology / biomedicine areas
- Provide educational and workforce impact for the State
- Enhance interdisciplinary collaborative research in nanotechnology and advanced materials

Indicative Results:

- The Biodesign Institute consists of 56 faculty and 119 academic professionals. Total staffing approximates 540.
- For FY09, the Biodesign Institute posted $42 million in research contracts & grants awards which is $2.0 million greater than the prior year. Industrial partners accounted for 30% and Federal agencies accounted for 70% of total Awards.
- For FY09, the Biodesign Institute generated a record $375 million in new research contract proposals.
- Dr. Sudhir Kumar, a professor in life sciences and director of the Center for Evolutionary Functional Genomics launched the Timetree of Life Initiative which provides information on species' origins that can be mined by researchers and used as a classroom tool.
- Dr. Bruce Rittmann, director of Biodesign's Center for Environmental Biotechnoloty, was honored with the prestigious 2009 Simon W. Freese Environmental Engineering Award, in recognition of his outstanding contributions to the field.
- Dr. Roy Curtiss, with funding from the Bill and Melinda Gates Foundation, developed a vaccine candidate to prevent pneumonia in newborns that will soon enter human clinical trials.
- Dr. Cheryl Nickerson's experiments aboard several NASA space shuttle flights demonstrated that germs become more infectious during space flight, and we revealed the mechanisms for these changes, suggesting a possible means for protecting flight crews.
- Dr. Joshua LaBaer was appointed as Director of the Biodesign Institute's new Virginia G. Piper Center for Personalized Diagnostics. Dr. LaBaer formerly directed the Harvard Institute of Proteomics.

Management

Office of the Vice President for Research and Economic Affairs

R.F. "Rick" Shangraw: Vice President for Research and Economic Affairs

Sethuraman Panchanathan: Deputy Vice President for Research

The Biodesign Institute

Alan Nelson: Executive Director

Biodesign Institute Advisory Board

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★ **Dr. James Wells**, President and CSO — Sunesis Pharmaceuticals

Learn More

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The Biodesign Institute
480.727.0370

ASU Arizona State University

ARIZONA STATE UNIVERSITY TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

Through interdisciplinary projects, Central Arizona-Phoenix Long-Term Ecological Research project scientists (top) examine the effects of urbanization on desert ecosystems.

The renovated building that houses ASU's Global Institute of Sustainability (middle) has become a global icon for sustainable design. Environmental Design + Construction *magazine awarded the building its 2009 Excellence in Design Award in its educational category for the project's demonstration of excellence in green building and sustainable design.*

Using state-of-the-art visualization, simulation, and collaboration tools, Decision Theater (bottom) is leading efforts to address global sustainability challenges and has become a powerful resource to aid decision-making efforts including mitigation of the spread of the A/H1N1 influenza strain known as the swine flu.

ASU GLOBAL INSTITUTE of SUSTAINABILITY
ARIZONA STATE UNIVERSITY

SUSTAINABILITY INITIATIVE

Arizona's quality of life, condition of the natural environment, and strength of the economy will increasingly depend on finding solutions to challenges of sustainability. These challenges include climate change, rapid urbanization, water quality and supply, biodiversity, social transformations, and energy supply and efficiency. ASU is committed to education, discovery, innovation, and outreach activities that will yield solutions to such challenges.

While the concept of sustainability was once associated exclusively with environmental advocacy, it has now become mainstream. Sustainability is rapidly becoming an academic discipline, a critical aspect of corporate competitiveness and profitability, and a platform for economic development policy. The Global Institute of Sustainability is ASU's primary vehicle for motivating, organizing, and assessing research in sustainability. Although the Institute itself is a relatively small unit, its mission is to work on a university-wide basis in support of teaching and research in sustainability science and to encourage ASU units to build bridges that connect scientists, policymakers, and business leaders on critical local and global challenges of sustainability.

Sustainability is a broad domain, including research investments in biodesign, engineering, public health, human evolution and social change, and life science. However, for purposes of focus and clarity, this document reports on past and proposed ASU TRIF investments in three areas that are involved in sustainability research:

- ***Arizona Institute for Renewable Energy (AIRE),*** *which oversees key investments intended to develop reliable, affordable, renewable energy sources and storage suitable for commercialization in the Southwest United States.*
- ***Decision Theater (DT),*** *a policy informatics and visualization laboratory that studies how decisions for a more sustainable future are made, understood, and improved.*
- ***Global Institute of Sustainability (GIOS),*** *which catalyzes and advances interdisciplinary research on environmental, economic, and social sustainability with a special focus on rapid urbanization.*

SUMMARY REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2009

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Dr. Robert Melnick
Executive Dean,
Global Institute of Sustainability

September 1, 2009

PERFORMANCE ANALYSIS

Sustainability PERFORMANCE MEASURES/IMPACT	FY10 Proj	FY11 Proj
Return on Investment ($ amounts in millions)		.
Federal and non-federal awards	32.20	40.00
Royalty income	0.10	0.30
Foundation funding	1.50	2.50
Return Total	33.80	42.80
Work Force Contributions		
Post-doctoral appointments	29	35
Post-doctoral researchers leaving to enter the workforce	13	18
Graduate students employed	114	142
Graduate students earning degrees and entering the workforce	43	60
Undergraduate students involved	77	87
Partnerships/Collaborations		
The number of research grants/contracts involving funding from non-government entities	24	33
The number of research grants/contracts involving subcontracts to non-ASU researchers	21	27

DISCUSSION OF PERFORMANCE

Return on Investment

The Sustainability Initiative is well poised to begin generating substantial research dollars from federal and non-federal awards. Investigators and affiliated faculty conducting Sustainability research are projected to hold more than $32M dollars in sponsored awards in FY10 and approximately $40M dollars in FY11. Sustainability proposal activity will continue to increase with the continued recruitment of senior faculty, the development of new programs, and new activity from junior faculty.

Economic Impact

The impacts of a successful investment in sustainability science research will include, but are not limited, to: the creation of well-paying “green jobs” in sustainability-related businesses; the development of an Arizona work force with the knowledge, analytic capability, and technical skills to power a “green economy;” the development of solutions to sustainability challenges such as water supply, rapid urbanization, land use, and biodiversity; an increase in public, philanthropic, and private funding of ASU research in renewable energy, decision making, and climate adaptation by 15 percent annually; and the development and transfer of new technologies to the private sector will expand.

Students Trained

Through the Sustainability Initiative the number of students prepared for the new “green economy” will grow. In FY10 there will be a projected 29 new post-doctoral appointments and an additional 13 post-doctoral researchers leaving ASU to enter the traditional work force. Also, approximately 114 graduate students and 77 undergraduate students will be involved in research through the initiative, and a projected 43 graduate students will earn their degrees and enter the work force. New interdisciplinary curricula in the School of Sustainability will offer degree options to educate the next-generation work force and prepare citizens for the renewable energy society.

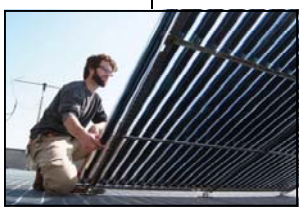
Partnerships/Collaborations

The number of partnerships and collaborations through the Sustainability Initiative is growing. This is reflected in the increasing number of research grants and contracts involving funding from non-governmental agencies and the number of subcontracts provided to non-ASU researchers. AIRE, DT, and GIOS all maintain many productive relationships with organizations from industry, government, and academia .

ECONOMIC OPPORTUNITIES

Conducting research and education on sustainability is a classic example of having the opportunity to "do good and do well" at the same time. Quite apart from the chance to help mitigate current, serious threats to local and global environmental quality, research and development in sustainability has become a significant opportunity for strengthening Arizona's economy. The federal government, large philanthropies, and the private sector are increasing their funding commitment to technologies, processes, and policy making in sustainability. As an example, the very backbone of the American Recovery and Reinvestment Act of 2009 (aka the "stimulus package") is comprised of investments in research that will both create "green jobs" and reduce U.S. dependence on limited and vulnerable foreign sources of energy. The funding available in FY10 from this Act alone exceeds $75 billion. Thus, a TRIF investment in sustainability research at ASU will help the state capitalize on this economic opportunity and, at the same time, educate a generation of decision makers.

ASU's principal TRIF investment in sustainability research is in renewable energy; that is, funding intended to attract talent and investment to the state from companies already in or intending to enter this lucrative market. This mission is consonant with a growing push by the Arizona economic development community to make the state the "solar capital of the world." Indeed, Arizona clearly has the potential to achieve this goal due to its large amount of land suitable for concentrated solar power (19,300 square miles), substantial existing engineering and biodesign talent, and abundance of sunshine (the highest of all the states with a resource potential of 7.5 kWh/m^2 per day). Indeed, research and development in "light inspired" energy, both to improve the efficiency and delivery of traditional technologies in solar power and to develop new, biomimetic approaches, are of great interest to private and public investors. Since the commercial viability of such technologies is influenced by economic policies, ASU will also use TRIF funds to develop decision-making data, models, and techniques that will enable Arizona leaders to make sound, science-based policy choices to enhance our economic prospects and, at the same time, create a more sustainable state.



Through ASU's National Center for Excellence on SMART Innovations (top), students work on applications for business, technology, and policy innovations related to climate change and energy.

Phase one of ASU's solar installations (bottom) totaled 1.88MW and is the largest solar portfolio on a single U.S. university campus.

FINANCIALS

Sustainability	FY10 Rev Budget	FY11 Rev Budget
REVENUE		
Carry Forward		
New TRIF Revenue	1,900,000	1,900,000
TOTAL REVENUE	**$1,900,000**	**$1,900,000**
OPERATING BUDGET		
Personal Services	775,200	775,200
Employee Related Expenses	182,400	182,400
Operating Expenses	562,400	562,400
Total Operating Budget	$1,520,000	$1,520,000
CAPITAL BUDGET		
Building Renovation	380,000	380,000
Debt Service		
Total Capital Budget	380,000	380,000
TOTAL EXPENDITURES	**$1,900,000**	**$1,900,000**
Return On Investment	**17.8:1**	**22.5:1**

Goals and Results

With support from TRIF and other sources of investment, ASU has developed a robust research program in sustainability. The university also recently launched the nation's first School of Sustainability. ASU's work on sustainability research and education will continue to accelerate and will achieve the follow goals in FY10 and beyond:

Goals

- Develop the next generation of high-efficiency, multijunction (MJ) solar cells
- Use nanostructures to boost the efficiency and lower the cost of thin-film solar cells
- Develop low-cost organic polymer and other organic and inorganic hybrid solar cells
- Establish an industrial laboratory for low-cost Si module design
- Offer new technology for the future "smart" electric grid
- Receive $24M in FY10 grants/contracts for renewable energy research
- Receive $1M in FY10 for research on sustainability decision making
- Receive $7.5M in FY10 for sustainability research in diverse subjects
- Be awarded one large scale ($5M-$20M) sustainability science research project in water management, atmospherics, climate change, or rapid urbanization

Indicative Results through June 30, 2009:

- Ongoing, multi-year research awards currently include the Central Arizona-Phoenix Long-Term Ecological Research ($5M/6 years/NSF), Decision Center for a Desert City ($6.7M/5 years/NSF), Designer Organisms for Biohydrogen Production ($10M/private donor), Conservation in a Social Context ($2M/5years/MacArthur Foundation)
- Awarded $14.6M in 2009 from the U.S. Department of Energy to establish an Energy Frontier Research Center on Artificial Photosynthesis
- Awarded $2.44M in 2008 for two Solar America Initiative programs (U.S. DOE)
- TUV Rheinland invested $5M in 2009 to start a new business (40,000 square-foot facility, 40 jobs created) in Tempe based on an ASU-developed solar energy assessment technology
- Algae-to-fuel research by ASU scientists was named the number 11 top invention of 2008 by Time, Inc and became a multi-million dollar spinout company: Heliae Development, LLC.
- The Decision Theater provided decision science workshops on climate change for the National Oceanic and Atmospheric Administration, American Meteorological Society, and the Arizona Water Institute and led exercises with government agencies regarding pandemic flu
- National recognition of ASU faculty research in sustainability science included the American Association for the Advancement of Science (Gober, Grimm), Leopold Leadership Fellowship (Wu), Carnegie Foundation for the Advancement of Teaching (Allenby), Ecological Society of America's (Fisher), Geochemical Society, and European Association for Geochemistry (Shock)

Management

Office of the Vice President for Research and Economic Affairs

R.F. "Rick" Shangraw: Vice President for Research and Economic Affairs

Sethuraman Panchanathan: Deputy Vice President for Research

Global Institute of Sustainability

Rob Melnick: Executive Dean

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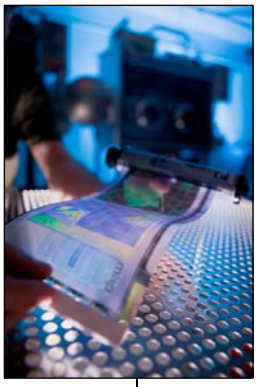
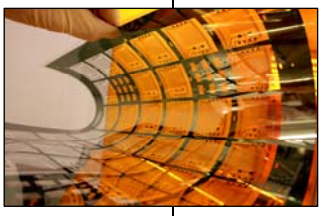
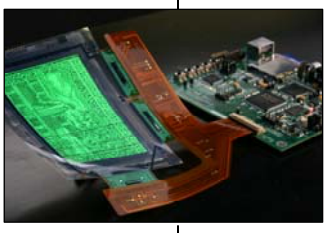
ASU
ARIZONA STATE UNIVERSITY

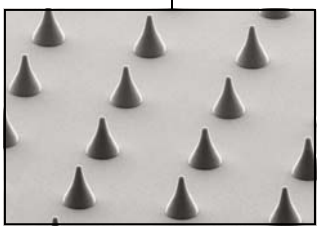
ARIZONA STATE UNIVERSITY TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

SUMMARY REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2009









The core competencies of FDC and ANBC demonstrate synergies that are anticipated to make dramatic impacts on the advanced electronics, materials, and workers needed to supply the emerging flexible electronics industry.

Advanced Materials Initiative

The Advanced Materials Initiative (AMI) seeks to expand ASU's research capacity in sensor development, nanotechnology, and the development and characterization of materials of interest to the flexible electronics areas. This initiative builds on ASU's existing strengths in nanoelectronics, sensor development, materials characterization, and emerging strengths in flexible electronics, and nanoscale science and technology. Applications for these technologies include novel microelectronic, microfluidic, and biotechnology devices integrated into microsystems for high-value-added applications in the information technologies, health care, threat detection, transportation, and manufacturing industries. Several industry reports have projected that by 2015 the emerging flexible electronics market could grow to greater than $100B with products such as flexible displays, sensors, energy modules, lighting systems, RF networks, and smart packaging.

AMI combines expertise and capabilities developed at the Flexible Display Center (FDC), and the Applied NanoBioscence Center (ANBC). The FDC was initiated in February 2004 under cooperative agreement W911NF-04-2-0005 by the U.S. Army to create an ASU-led Center that collaborates with government, industry, and other universities to develop solutions for technology development and manufacturing challenges in flexible displays and flexible electronics. FDC has successfully implemented a flexible electronics Pilot Line manufacturing-consistent infrastructure and collaborated on materials and processing tools development to provide supply chain and process development solutions that address flexible substrate system and handling issues.

ANBC specializes in advanced materials and processes for flexible transparent conductors, integrated electronics and energy sources, organic electronics, and system-on-chip technology. In collaboration with universities and industry partners, ANBC is making significant breakthrough developments in converging nanoscience, biotechnology and cognitive science into technology platforms that can be mass produced. To create new ways to diagnose disease, monitor health, and build enabling polymer electronics, new technologies are merged from nanoscience, microelectromechanical systems (MEMS), polymer and ambient intelligence with genomics and molecular biology. This fusion allows for the creation of novel sensor systems with a broad range of commercial applications.

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Dr. Nick Colaneri
Director, Flexible Display Center

PERFORMANCE ANALYSIS

Advanced Materials Initiative PERFORMANCE MEASURES/IMPACT	FY10 Proj	FY11 Proj
Return on Investment ($ amounts in millions)		.
Federal and non-federal awards	31.20	27.60
Royalty income	0.02	0.05
Foundation funding	0.04	0.04
Return Total	31.26	27.69
Work Force Contributions		
Post-doctoral appointments	20	23
Post-doctoral researchers leaving to enter the workforce	10	14
Graduate students employed	7	4
Graduate students earning degrees and entering the workforce	3	4
Undergraduate students involved	4	6
Partnerships/Collaborations		
The number of research grants/contracts involving funding from non-government entities	8	6
The number of research grants/contracts involving subcontracts to non-ASU researchers	3	5

DISCUSSION OF PERFORMANCE

Return on Investment The core funding for AMI is a 10-year cooperative agreement award from the U.S. Army of $93.7M to establish and lead a collaborative partnership to develop flexible, rugged, light-weight, low-power, information displays and electronics for the future war fighter and other military and commercial applications. Industrial members provide an additional $20M million in in-kind and cash contributions over the 10-year agreement. Most of the science for the flexible display initiative has been conducted at the Center; however some related FTA funded projects have allow the FDC to leverage another $10M in funding to support technology development. Other grants include a $3.8 million grant from the Department of Justice to develop a system for the FBI that integrates the current multiple steps of forensic DNA analysis for faster results, an $800,000 grant from the Naval Research Laboratory to develop a lab-on-chip for bioagents, and a $580,000 grant from the Department of Justice to design a microchip for detecting terrorist activity.

Economic Impact The initiative will generate research and clinical partnerships that significantly impact our local economy. According to analysis done by the NIST ATP, $1M in government funding triggers $1.6M industry cost-sharing, causing $8M total economic impact, creating/maintaining about 100 jobs based on an average high tech job average salary of $80K.

Students Trained Full integration of an education and training dimension is positioning the Institute to provide industry with highly capable engineers and scientists skilled in emerging technology development. Educational and workforce development plans include expansion and development of a formal internship program, a devoted student research pilot line tool set, curriculum offerings specific to flexible electronics, an Arizona corporate advisory and sponsorship program and Arizona university and high school student outreach efforts.

Partnerships/Collaborations Partnerships and collaborative relationships serve a critical role in the success of the AMI. The FDC has a proven collaborative partnership model with 27 engaged industry members (33% Arizona-based), 3 university members and strategic alliances with the FlexTech Alliance and the Center for Advanced Microelectronics. ANBC has 12 active partnerships and/ or joint consortium with a wide range of organizations. The Center infrastructure comprises clinical resources with Scottsdale Clinical Research Institute, TGen Clinical Services and other AZ clinical partners. ANBC and TGen co-founded Nanobiomics, that merged with the Molecular Profiling Institute, acquired by Caris Diagnostics. A Center for Interdisciplinary Research in Nanotechnology (CIRN) was developed in partnership with Motorola Labs to develop nanosensors for first responder product applications, and a MIDRA Consortium with Motorola Italy and the University of Florence to develop sensors and wireless communication networks. Strategic alliances with major international consortia in Europe and Asia are being formed.

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, the Translational Genomics Research Institute, the state Medicaid Agency (AHCCCS), and Maricopa Integrated Health Services. These and future partnerships include joint hires, joint research projects, and planned internships and projects for BMI students.

AMI RESEARCH FOCI

The AMI academic-government-industry business model and research-to-manufacturing operational model coupled with unique and synergistic flexible backplane array and biosensor research infrastructure, positions the AMI to be a national leader in the flexible electronics industry. As demonstrated by companies that collocated in the MTW Facility and the recent spin-out companies, AMI has potential to become a business nexus that will differentiate Arizona and provide a competitive advantage for Arizona and AMI collaborators.

The MacroTechnology Works (MTW) Facility, where the FDC and ANBC are collocated, was designed as a organizational mechanism that allows ASU to advance technology in three integrated modalities that are a departure from standard university practice: (1) large scale engagement of industry, (2) integration of design, technology and engineering for product development and (3) rapid applied consumer-driven innovation. This approach bridges the gap between conceptual research and production-ready-product. This model begins with collaboration, conceptualization, design and test, prototype production, regulatory compliance and leads to a product ready for technology transition.

Electronic Design Automation (EDA) for IC Design, Modeling and Simulation: A professional suite of flexible, large area microelectronics design tools has been implemented including: circuit simulation, design rule checking (DRC), layer verification (LVS), layout, AutoPlace and Route with *Standard Cell Library Development Capability,* state-of-the-art a-Si:H transistor models including VT Shift, and an extensive suite of digital and analog circuit testing equipment. Recently, a circuit simulator that can predict the complex post-degradation response of arbitrary a-Si:H TFT circuits was developed. Also, a standard cell library for a-Si:H TFTs on flexible stainless steel and plastic substrates was developed. The standard cell library enables layout automation with a standard cell place and route tool, significantly reducing the time to layout a-Si:H digital circuits on the backplane and thus enhancing functionality.

Flexible Electronics Pilot Line Fabrication: Pilot Line tool sets are linked to a Manufacturing Execution System (MES) for efficient lot management and statistical process control (SPC) and include the following:

- 6-Inch (150 mm) Wafer-scale Pilot Line for Research and Development (3 micron feature size (L/S))
- GEN II (370 mm x 470 mm) Pilot Line for Low Volume Production (3 micron feature size (L/S))

Capabilities also include characterization tools/processes and plans are in place to pursue printed electronics capabilities and pilot-line level organic light emitting diode (OLED) integration.

Integrated Electronics for Advanced Functionality: This research is focused on: integrated nano/micro-systems design, modeling, and prototyping; development of fabrication and characterization techniques optimized for nanoscale applications; molecular techniques for manipulating single biomolecules and cells; and integrated systems for application-oriented products and information solutions. Considerable proficiency has been demonstrated in: biochips for genomics/proteomics; microfluidics and microanalytical technology; nanoconstrictions; atomic and molecular technology; nanosystems design and fabrication; microscale fluid dynamics modeling; and hybrid nanoelectronics processing and "lab-fab" prototyping. Skills have been developed for bioassay development and polymer-based processing. Plans include improving: micro/nano fabrication processes, materials biocompatibility, assays, and integration and functionalities. Improved processable materials, flexible transparent conductors, integrated electronics and energy sources, organic electronics, and system-on-chip technology are also in work.

Technology Demonstrators and Technology Transition: In order to increase a user demand for the technology it is critical to demonstrate its application in a real world scenario. Considerable capability exists to develop hardware to demonstrate newly developed technologies. AzTE is a resource that is used to facilitateted the transition process.

FINANCIALS

Advanced Materials Initiative	FY10 Rev Budget	FY11 Rev Budget
REVENUE		
Carry Forward		
New TRIF Revenue	400,000	400,000
TOTAL REVENUE	**$400,000**	**$400,000**
OPERATING BUDGET		
Personal Services	163,200	163,200
Employee Related Expenses	38,400	38,400
Operating Expenses	118,400	118,400
Total Operating Budget	$320,000	$320,000
CAPITAL BUDGET		
Building Renovation	80,000	80,000
Debt Service		
Total Capital Budget	80,000	80,000
TOTAL EXPENDITURES	**$400,000**	**$400,000**
Return On Investment	**78.1:1**	**69.2:1**

Goals & Results

Goals:

- Develop a robust research engine to strategically address emerging flexible electronics opportunities and to accelerate technology transition opportunities.
- Position Arizona as a leader in the flexible microelectronics industry and promote Arizona businesses that will in turn build on the Arizona economy, provide more and higher paid knowledge-based jobs and help attract new business investments.
- Apply advances in nanoscience, molecular biology and genomics to a new generation of enabling tools converging nano- and micro-scale technologies to better understand the molecular origin of diseases.
- Employ best scientific and engineering practices to help fundamentally change the approach to improving global public health, by developing and facilitating the use of molecular diagnostic tests.
- Advance personalized medicine by fostering transformation of biological and physical principles into effective products with focused impact on oncology, orphan rare diseases and infectious diseases

Results and Updates: Several technology platforms have been scaled up and commercialization is ongoing.

- Contributed to tool and materials development and commercialization needed for flexible electronics manufacturing: DuPont Teijin Films' Planarized PEN substrate material, EV Group's large-area thin film spray coater, and Honeywell's thermally stable family of planarization, electrical isolation, and passivation materials.
- Generated IP for non-volatile a-Si memory, flexible substrate systems, low-temperature transistor processing onto flexible substrates and temporary bonding procedures to allow standard semiconductor processing of flexible substrates. Discussions are in progress with 6 companies for transition of this IP to commercial use.
- FDC flexible displays highlighted by WIRED Magazine as a Top 10 technology breakthrough for 2008.
- Jointly developed DNA solutions with FBI and leaders in DNA forensics which is being validated as an international standard for deployment in casework investigations.
- Developed specialized molecular medical responses for acute medical management of radiation injury in cancer treatment or radiologic and nuclear events.
- Submitted the ANBC blood-based gene expression assay and instrumentation to the FDA.
- Optimized novel bioassay chemistries in collaboration with diagnostics corporations and federal agencies for molecular diagnostics of cardiovascular diseases, colon and melanoma
- Obtained contracts for developing "green' high-density energy systems using biofuels and fuel cells (FC).

Management

Office for the Vice President for Research and Economic affairs

R.F. "Rick" Shangraw: Vice President for Research and Economic Affairs

Sethuraman "Panch" Panchanathan: Deputy Vice President for Research

Advisory Board

- **David C. Morton —** Flexible Display and Electronics Manager, Army Research Laboratory, Sensors and Electron Devices Directorate
- **Keith Rollins —** Global Displays Market Manager, DuPont Teijin Films (UK) Ltd.
- **Abbie Gregg —** Owner, Abbie Gregg Inc.
- **Steve Dwyer —** VP and General Manager, EV Group, North American Headquarters
- **Mike Idacavage —** Principal Research Fellow, Cytec Industries, Inc.

Building Locations

AMI is located in the MacroTechnology Works Building in the ASU Research Park in Tempe.

Learn More

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http://ovprea.asu.edu/

Advanced Materials Initiative
Telephone: 480.727.8941
Web: http://flexdisplay.asu.edu

ASU
ARIZONA STATE UNIVERSITY

ARIZONA STATE UNIVERSITY

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 BUDGET AND ACTUAL / FY 2010 - 2011 BUDGETS

ASU POLYTECHNIC CERTIFICATES OF PARTICIPATION (COPs)

	FY 2008 ACTUAL	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE					
Carryforward	$ 76,900	$ -	$ (5,100)	$ (5,100)	$ -
TRIF Revenue	2,005,900	2,084,200	2,084,200	2,088,900	2,081,600
TOTAL REVENUE	**$ 2,082,800**	**$ 2,084,200**	**$ 2,079,100**	**$ 2,083,800**	**$ 2,081,600**
EXPENDITURES					
OPERATING BUDGET					
Personal Services					
ERE					
All Other Operating					
TOTAL OPERATING BUDGET	**-**	**-**	**-**	**-**	**-**
CAPITAL BUDGET					
Building Renovation					
Debt Service					
COPs Lease Purchase Payment	2,082,800	2,084,200	2,084,200	2,083,800	2,081,600
TOTAL CAPITAL BUDGET	**2,082,800**	**2,084,200**	**2,084,200**	**2,083,800**	**2,081,600**
EXPENDITURES GRAND TOTAL	**$ 2,082,800**	**$ 2,084,200**	**$ 2,084,200**	**$ 2,083,800**	**$ 2,081,600**

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

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 BUDGET AND ACTUAL / FY 2010 - 2011 BUDGETS

ASU WEST CERTIFICATES OF PARTICIPATION (COPs)

	FY 2008 ACTUAL	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE					
Carryforward	$ 63,900	$ 30,000	$ 26,500	$ 26,500	$ -
TRIF Revenue	1,605,100	1,634,600	1,634,600	1,604,500	1,637,000
TOTAL REVENUE	**$ 1,669,000**	**$ 1,664,600**	**$ 1,661,100**	**$ 1,631,000**	**$ 1,637,000**
EXPENDITURES					
OPERATING BUDGET					
Personal Services					
ERE					
All Other Operating					
TOTAL OPERATING BUDGET	**-**	**-**	**-**	**-**	**-**
CAPITAL BUDGET					
Building Renovation					
Debt Service					
COPs Lease Purchase Payment	1,639,000	1,664,600	1,634,600	1,631,000	1,637,000
TOTAL CAPITAL BUDGET	**1,639,000**	**1,664,600**	**1,634,600**	**1,631,000**	**1,637,000**
EXPENDITURES GRAND TOTAL	**$ 1,639,000**	**$ 1,664,600**	**$ 1,634,600**	**$ 1,631,000**	**$ 1,637,000**

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.

FY 2007-2011 ASU-UA Joint Biomedical Research Fund
Arizona State University
University of Arizona

September 1, 2009

Arizona State University and the University of Arizona jointly administer the TRIF-funded *Collaborative on Biomedical Research Grant Program* with ten awards originally scheduled to total $2,000,000 ($1,000,000 each) in FY07 and $1,000,000 ($500,000 each) per year in FY08-FY11.

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 University of Arizona College of Medicine-Phoenix in partnership with Arizona State University 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. 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; and,
- Potential for impact on overall State-wide strength in biomedical sciences.

The program awarded $2,000,000 in FY07 and $1,000,000 in FY08 to the ten projects through a competitive process. Due to the economic downturn and growing shortfall in TRIF revenues, the projects were ended in FY09 and drew to a close in June 2009 with the principal investigators having submitted their final reports. UA and ASU are working with the principal

investigators of the BIO5 Institute and the Biodesign Institute to continue the creation of collaborative research projects between our institutions.

The TRIF support resulted in 68 scientific presentations and publications and the submission of proposals valued at $19.5M for external support for the continuation of these projects.

Title	PI	Total TRIF Award	Total Publications and Presentations	Total Pending Proposals and Awards
Proteomic and Metabolomic Biomarker Investigation of Type 2 Diabetes [(1)]	Nelson-ASU Lau-UA	$250,000	11	$5,853,000
Geno- and Immuno-Signatures in Acute Asthma	Johnson-ASU Martinez-UA	$297,977	8	$3,421,175
Development of a Rapid Immunosignature Diagnostic Test for Valley Fever	Magee-ASU Shubitz-UA	$320,000	0	$1,520,431
Molecular Therapeutics Collaborative Program between BIO5 and BioDesign Institutes	Hecht-ASU Hurley-UA	$325,000	3	$0
Rapid Biomarker Analysis for Emergency Medicine	Posner-ASU Wirth-UA	$325,955	2	$2,020,737
A Network-Science Approach to Normal- Tissue Organization and Carcinogenesis	Lai-ASU Gatenby-UA	$325,955	7	$0
A Digital Media Based Biofeedback System for Neural Rehabilitation	Rikakis-ASU Baldwin-UA	$325,955	10	$5,100,425
Evaluating the Role of VDR Polymorphisms and B-Catenin Signaling in Colorectal Adenoma Risk	Jurutka-ASU Thompson-UA	$177,248	15	$1,250,000
Selective Modulation of Basal Ganglia Excitability: A Potential Gene Therapy for Parkinson's Disease	Tillery-ASU Falk-UA	$325,955	6	$0 (planned NIH-R01 application in 2010)
Novel Superluminescent LEDs and Ultrahigh-resolution for OCT for Medical Imaging Applications	Zhang-ASU Barton-UA	$325,955	6	$382,044

[(1)] Patent Disclosure M8-049L, U.S> Provisional #61/069,674, International PCT application #PCT/US2009/037369 for Biomarkers and assays for Diabetes

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NORTHERN ARIZONA UNIVERSITY

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 - 2011 BUDGETS

SUMMARY

	FY 2007 ACTUAL	*FY 2008 ACTUAL*	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE						
Carryforward	$ 13,264,390	$ 10,185,985	$ 10,354,969	$ 10,354,969	$ 8,439,874	$ 32,810
TRIF Revenue	14,612,967	15,159,929	12,135,171	12,257,112	11,516,654	11,495,811
TOTAL REVENUE	**$ 27,877,357**	**$ 25,345,914**	**$ 22,490,140**	**$ 22,612,081**	**$ 19,956,528**	**$ 11,528,621**
EXPENDITURES						
OPERATING BUDGET						
Personal Services	$ 6,413,799	$ 6,369,866	$ 8,332,092	$ 6,358,862	$ 7,722,413	$ 5,325,576
ERE	1,820,063	1,983,389	2,426,259	2,017,377	2,335,645	1,521,801
All Other Operating	3,558,889	5,178,681	7,928,471	3,792,044	7,762,274	2,580,759
TOTAL OPERATING BUDGET	**11,792,751**	**13,531,936**	**18,686,822**	**12,168,283**	**17,820,332**	**9,428,136**
CAPITAL BUDGET						
Building Renovation	-	500,000	-	-	-	-
Debt Service	3,091,339	796,179	3,803,318	2,003,924	2,103,386	2,100,485
Conf Center/New Construction Support	4,071,491	162,830	-	-	-	-
TOTAL CAPITAL BUDGET	**7,162,830**	**1,459,009**	**3,803,318**	**2,003,924**	**2,103,386**	**2,100,485**
EXPENDITURES GRAND TOTAL	**$ 18,955,581**	**$ 14,990,945**	**$ 22,490,140**	**$ 14,172,207**	**$ 19,923,718**	**$ 11,528,621**
SUMMARY BY INITIATIVE						
Access and Workforce Development	$ 5,556,985	$ 3,415,637	$ 2,649,478	$ 2,219,276	$ 2,654,597	$ 2,197,033
Growing Biotechnology	917,127	659,595	517,314	454,237	350,421	283,809
e-Learning	2,041,506	1,939,262	1,499,174	1,497,856	1,343,370	1,325,544
ERDENE (Environmental)	1,967,092	1,790,069	2,249,518	1,556,379	2,259,194	1,546,791
Capital Projects	2,824,999	(162,821)	-	-	-	-
University Initiatives	2,904,282	931,349	5,397,012	2,492,682	5,586,571	2,649,246
AZUN	2,320,413	2,732,934	4,066,610	2,630,874	3,079,047	1,688,312
Healthcare Program Expansion	32,165	965,052	2,917,429	1,647,531	2,051,993	772,474
NAU Statewide Expansion	391,012	2,219,868	1,422,164	948,480	1,255,779	772,474
NAU-Yuma Expansion	-	500,000	1,500,000	545,910	954,090	-
Promoting Forest Health in Arizona	-	-	271,441	178,982	388,656	292,938
EXPENDITURES GRAND TOTAL	**$ 18,955,581**	**$ 14,990,945**	**$ 22,490,140**	**$ 14,172,207**	**$ 19,923,718**	**$ 11,528,621**

FY 2009 revenue/expense reported prior to official fiscal year close.

NORTHERN ARIZONA UNIVERSITY

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 - 2011 BUDGETS

ARIZONA UNIVERSITIES NETWORK (AZUN) SUMMARY

	FY 2007 ACTUAL	*FY 2008 ACTUAL*	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE						
Carryforward	$ 3,115,813	$ 2,938,105	$ 2,313,450	$ 2,313,450	$ 1,453,353	$ 32,810
TRIF Revenue	2,142,705	2,108,279	1,753,160	1,770,777	1,658,504	1,655,502
TOTAL REVENUE	**$ 5,258,518**	**$ 5,046,384**	**$ 4,066,610**	**$ 4,084,227**	**$ 3,111,857**	**$ 1,688,312**
EXPENDITURES						
OPERATING BUDGET						
Personal Services	$ 721,011	$ 888,896	$ 1,160,340	$ 924,311	$ 1,026,674	$ 525,000
ERE	236,840	306,859	374,400	327,815	354,428	187,025
All Other Operating	1,362,562	1,037,179	2,031,870	878,749	1,197,945	476,287
TOTAL OPERATING BUDGET	**2,320,413**	**2,232,934**	**3,566,610**	**2,130,874**	**2,579,047**	**1,188,312**
CAPITAL BUDGET						
Building Renovation	-	-	-	-	-	-
Debt Service	-	500,000	500,000	500,000	500,000	500,000
Conf Center/New Construction Support	-	-	-	-	-	-
TOTAL CAPITAL BUDGET	**-**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**
EXPENDITURES GRAND TOTAL	**$ 2,320,413**	**$ 2,732,934**	**$ 4,066,610**	**$ 2,630,874**	**$ 3,079,047**	**$ 1,688,312**

FY 2009 revenue/expense reported prior to official fiscal year close.
Above AZUN numbers are included in NAU Summary on previous page and are broken out separately here for information purposes only.
Memorandum of Understanding (MOU) between ABOR and NAU for management of AZUN has extended through June 30, 2013.

NORTHERN ARIZONA UNIVERSITY

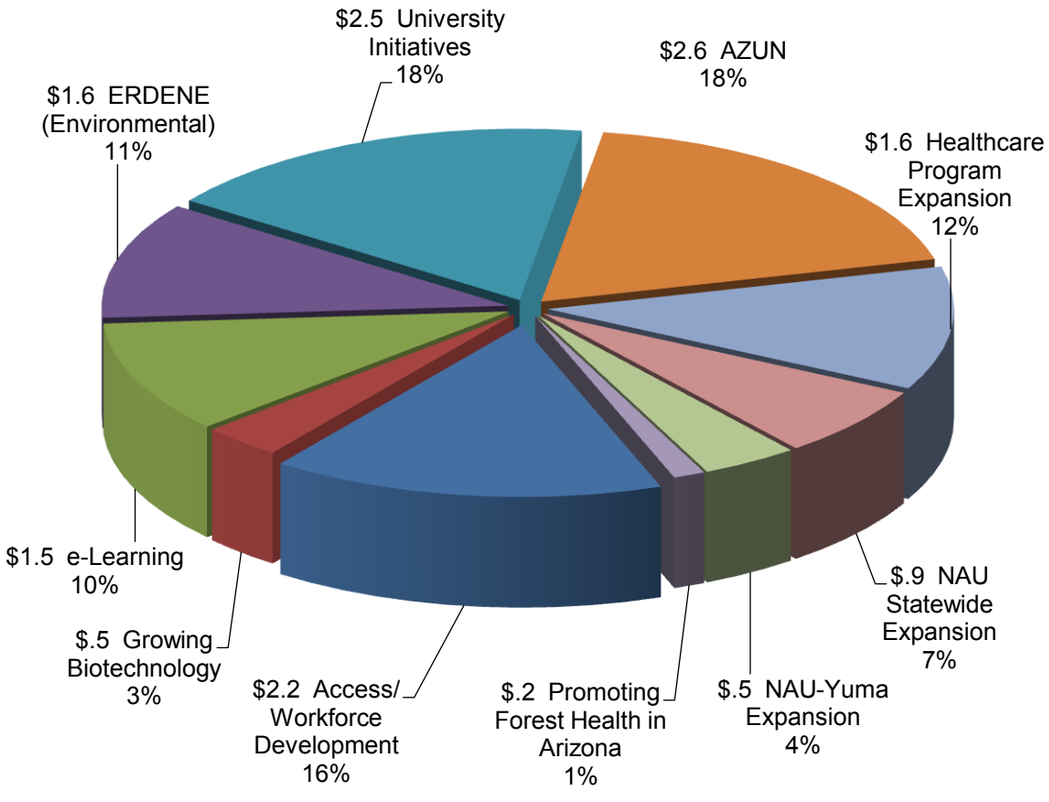
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 BUDGET / ACTUAL

SUMMARY BY PROGRAM AREA

	FY 2009 REVISED BUDGET	*FY 2009 ACTUAL*
REVENUE		
Carryforward	$ 10,354,969	$ 10,354,969
TRIF Revenue	12,135,171	12,257,112
TOTAL REVENUE	**$ 22,490,140**	**$ 22,612,081**
EXPENDITURES		
OPERATING BUDGET		
Personal Services	$ 8,332,092	$ 6,358,862
ERE	2,426,259	2,017,377
All Other Operating	7,928,471	3,792,044
TOTAL OPERATING BUDGET	**18,686,822**	**12,168,283**
CAPITAL BUDGET		
Building Renovation	-	-
Debt Service	3,803,318	2,003,924
Conf Center/New Construction Support	-	-
TOTAL CAPITAL BUDGET	**3,803,318**	**2,003,924**
EXPENDITURES GRAND TOTAL	**$ 22,490,140**	**$ 14,172,207**
SUMMARY BY INITIATIVE		
Access and Workforce Development	$ 2,649,478	$ 2,219,276
Growing Biotechnology	517,314	454,237
e-Learning	1,499,174	1,497,856
ERDENE (Environmental)	2,249,518	1,556,379
Capital Projects	-	-
University Initiatives	5,397,012	2,492,682
AZUN	4,066,610	2,630,874
Healthcare Program Expansion	2,917,429	1,647,531
NAU Statewide Expansion	1,422,164	948,480
NAU-Yuma Expansion	1,500,000	545,910
Promoting Forest Health in Arizona	271,441	178,982
EXPENDITURES GRAND TOTAL	**$ 22,490,140**	**$ 14,172,207**

FY 2009 NAU ACTUAL TRIF EXPENDITURES
(in millions)



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TRIF PROGRAM

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

THE NORTHERN ARIZONA UNIVERSITY TRIF PROGRAM

In the first 8 years of TRIF funding, from FY 2002 to FY 2009, Northern Arizona University made significant strides in all areas funded.

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 projects, University Initiatives, Healthcare Program Expansion, Statewide Expansion, NAU-Yuma Expansion and Building Healthy Forest have allowed Northern Arizona University to invest in facilities and projects related that would not have otherwise been possible. ABOR and the university can take pride in the contributions TRIF funds have made to the High Country Conference Center, the Applied Research and Development building and the Laboratory Science building. Using TRIF funds, NAU is fulfilling its promise to expand health care programming and the university has been able to create an anchor facility in North Phoenix as well as investing to help NAU-Yuma achieve its considerable progress. Through the Healthy Forest Initiative, NAU has helped advance partnerships and knowledge with regard to forest restoration..

More detail about all of these initiatives can be found in the individual project brochures. NAU is grateful to the Arizona Board of Regents for its support, and will continue to work hard to make the best use possible of TRIF funds allocated to it.

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Dr. John Haeger, President
Northern Arizona University

PERFORMANCE ANALYSIS

GBI / ERDENE		FY 02 Act	FY 03 Act	FY 04 Act	FY 05 Act	FY 06 Act	FY 07 Act	FY 08 Proj	FY08 Act	FY 09 Proj	FY09 Act	FY 10 Proj	FY 11 Proj
ROI	Leveraged dollars ($M)	$7.90	$11.30	$11.00	$15.20	$8.90	$14.90	$8.10	$15.20	$8.90	$15.60	$10.10	$10.90
	ROI ratio	4.20 : 1	4.56 : 1	3.72 : 1	5.71 : 1	3.28 : 1	5.1 : 1	2.91 : 1	6.1:1	3.19 : 1	8.2:1	3.63 : 1	3.91 : 1
Publications / Conferences	Conferences Sponsored	14	19	21	28	26	21	5	42	10	2	15	20
	Presentations/ Publications	133	180	197	373	166	286	180	3137 (inc. web accesses)	190	126	210	220
Tech Transfer	Patent Applications/Patents Generated	2	2	2	1	3	2	3	5	4	2	5	6
	Products Generated and in the Marketplace	0	5	49	8	13	5	5	4	7	0	10	12
Economic Development	Business Expansions/Spinoffs/ Creations	3	3	7	21	10	5	3	10	5	0	7	11
Workforce Contributions	Graduate/Postdoc Students Trained	116	149	162	60	67	58	82	137	85	61	93	100
	Undergrad Students Trained	106	205	106	93	135	119	135	175	160	57	175	195
	Continuing Education Professionals	85	312	1361	142	274	42	132	142	142	29	152	162
Specific Collaborations	Government/University collaborations	81	209	175	240	238	229	125	225	135	50	147	162
Access and Workforce Development / e-Learning		**FY 02 Act**	**FY 03 Act**	**FY 04 Act**	**FY 05 Act**	**FY 06 Act**	**FY 07 Act**	**FY 08 Proj**	**FY08 Act**	**FY 09 Proj**	**FY09 Act**	**FY 10 Proj**	**FY 11 Proj**
New Students Served	New Teachers	250	542	807	679	773	804	700	1019	750	1,058	750	750
	Nurses/Health Professionals	120	266	414	464	540	721	500	640	500	680	600	600
	Business/Non-Profit Managers	44	182	303	442	528	673	400	725	450	816	450	500
	Number Degree/Certificate Programs	11	19	37	41	41	41	42	41	44	41	46	48
Enhanced Courses Developed	Web-IT/Enhanced Courses Developed	125	101	121	141	22	80	95	67	90	78	85	80
	Number Faculty Participating Web Development	150	117	155	126	241	325	225	210	250	397 [c]	300	350
Student Course Involvement	Student Enrollments In Online Courses	7,110	9,476	10,133	12,381	14116	20,526	12,750	31,568	13,000	35,637 [d]	13,500	14,000
Partnerships	Number K-12 Partners (Schools/Districts)	30	51	119	127	127	127	125	126	130	125	135	140
	Higher Education Partnerships	17	19	20	20	22	22	20	23	20	3	20	20
	Private Sector Partnerships	2	21	42	77	80	80	54	85	57	89	60	62
Technology Transfer	Courses/Modules Sold/Brokered	0	5	0	0	0	0	1	0	1	0	1	1

PERFORMANCE ANALYSIS

In addition to the Initiative successes described on page 1 and 2 of this brochure, Northern Arizona University takes particular pride in its achievements in the area of health care education. Funds from TRIF combined with funds allocated by the Arizona Legislature are allowing NAU to make significant strides in expanding health care education opportunities to citizens throughout Arizona and preparation for offering programs currently not available at any Arizona public institution . Please see our "Expanding Health Care" brochure for more information.

FINANCIAL INFORMATION

		FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
GBI/ERDENE	Carryforward	$0	$538,756	$734,337	$497,302	$830,232	$1,008,633	$915,237	$828,245	$775,696	$0
	New TRIF Revenue	$2,417,502	$2,674,544	$2,498,906	$2,745,600	$2,888,423	$2,790,824	$2,362,672	$1,958,067	$1,833,919	$1,830,600
	TOTAL REV	$2,417,502	$3,213,300	$3,233,243	$3,242,902	$3,718,655	$3,799,457	$3,277,909	$2,786,312	$2,609,615	$1,830,600
	Personal Services	$1,278,627	$1,637,980	$2,132,447	$2,335,730	$1,770,725	$2,418,854	$1,645,775	$1,377,285	$2,322,596	$1,607,791
	Other Operating	$600,119	$840,983	$827,573	$368,742	$939,297	$465,365	$803,889	$633,331	$287,019	$222,809
	TOTAL EXP	$1,878,746	$2,478,963	$2,960,020	$2,704,472	$2,710,022	$2,884,219	$2,449,664	$2,010,616	$2,609,615	$1,830,600
AWD/E-LEARNING	Carryforward	$0	$2,164,798	$2,711,282	$2,263,265	$2,776,537	$1,680,175	$1,050,709	$418,276	$469,003	$0
	New TRIF Revenue	$5,135,129	$4,878,299	$5,662,818	$4,927,273	$5,183,586	$6,969,025	$4,722,466	$3,767,859	$3,528,964	$3,522,577
	TOTAL REV	$5,135,129	$7,043,097	$8,374,100	$7,190,538	$7,960,123	$8,649,200	$5,773,175	$4,186,135	$3,997,967	$3,522,577
	Personal Services	$2,326,003	$3,412,531	$4,069,277	$4,011,236	$4,150,863	$4,703,165	$4,378,114	$3,313,321	$3,524,051	$3,317,033
	Other Operating	$644,328	$919,284	$1,836,743	$942,881	$2,129,085	$823,835	$976,785	$403,810	$473,916	$205,544
	Debt Service	$0	$0	$0	$0	$0	$2,071,491	$0	$0	$0	$0
	TOTAL EXP	$2,970,331	$4,331,815	$5,906,020	$4,954,117	$6,279,948	$7,598,491	$5,354,899	$3,717,132	$3,997,967	$3,522,577
UNIVERSITY INITIATIVES AND CAPITAL	Carry Forward	$0	$206,744	$664,608	$1,674,629	$3,054,612	$5,159,771	$120,491	$2,591,491	$2,932,523	$0
	New TRIF Revenue	$298,203	$590,810	$938,517	$2,552,961	$1,764,371	$690,001	$3,239,528	$2,833,714	$2,654,048	$2,649,246
	TOTAL REV	$298,203	$797,554	$1,603,125	$4,227,590	$4,818,983	$5,849,772	$3,360,019	$5,425,205	$5,586,571	$2,649,246
	Personal Services	$36,174	$72,666	$62,927	$266,070	$340,462	$153,992	$219,028	$428,828	$345,519	$364,523
	Operating	$55,285	$60,280	$17,761	$188,050	-$681,250	$483,950	$90,491	$559,930	$3,637,666	$684,238
	Conference Center	$0	$0	$0	$0	$0	$2,000,000	$162,830	$0	$0	$0
	Debt Service	$0	$0	$0	$0	$0	$3,091,339	$296,179	$1,503,924	$1,603,386	$1,600,485
	TOTAL EXP	$91,459	$132,946	$80,688	$454,120	-$340,788	$5,729,281	$768,528	$2,492,682	$5,586,571	$2,649,246
HEALTHCARE AND STATEWIDE EXPANSION	Carry Forward					$0	$2,299,998	$3,897,233	$2,703,507	$1,760,022	$0
	New TRIF Revenue					$2,299,998	$2,020,412	$1,991,194	$1,652,526	$1,547,750	$1,544,948
	TOTAL REV					$2,299,998	$4,320,410	$5,888,427	$4,356,033	$3,307,772	$1,544,948
	Personal Services					$0	$0	$914,583	$1,305,631	$1,283,600	$566,005
	Operating					$0	$423,177	$2,270,337	$1,290,380	$2,024,172	$978,943
	TOTAL EXP					$0	$423,177	$3,184,920	$2,596,011	$3,307,772	$1,544,948
TSI -- YUMA/HEALTHY FORESTS	Carry Forward							$1,264,210	$1,500,000	$1,049,277	$0
	New TRIF Revenue							$735,790	$274,169	$293,469	$292,938
	TOTAL REV							$2,000,000	$1,774,169	$1,342,746	$292,938
	Personal Services							$0	$699,048	$1,201,190	$280,000
	Operating							$0	$25,844	$141,556	$12,938
	Debt Svc/Build-out							$500,000	$0	$0	$0
	TOTAL EXP							$500,000	$724,892	$1,342,746	$292,938
AZUN	Carry Forward				$1,615,559	$2,534,652	$3,115,813	$2,938,105	$2,313,450	$1,453,353	$32,810
	New TRIF Revenue				$1,228,962	$2,034,906	$2,142,705	$2,108,279	$1,770,777	$1,658,504	$1,655,502
	TOTAL REV				$2,844,521	$4,569,558	$5,258,518	5046384	$4,084,227	$3,111,857	$1,688,312
	Personal Services				$2,983	$344,531	$957,851	$1,195,755	$1,252,125	$1,381,102	$712,025
	All Other Operating				$306,886	$1,109,214	$1,362,562	$1,037,179	$878,749	$1,197,945	$476,287
	Debt Svc				$0	$0	$0	$500,000	$500,000	$500,000	$500,000
	TOTAL EXP				$309,869	$1,453,745	$2,320,413	2732934	$2,630,874	$3,079,047	$1,688,312

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. Laura Huenneke, Vice President for Research. Appropriate Vice Presidents and Deans also participate in specific project management.

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.

GROWING BIOTECHNOLOGY (GBI)

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

GBI Director Dr. Tim Porter and Director of Strategic Environmental Initiatives Shelley Silbert report Dr. Laura Huenneke, Vice President for Research. Research Initiatives within GBI and ERDENE report to their respective directors.

GBI and ERDENE Advisory Board Members:

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

Barry Gold
Gordon & Betty Moore Foundation

David LaRoche
U.S. Environmental Protection Agency

Paul Jagodzinski
NAU Dean of the College of Engineering, Forestry and Natural Sciences

Michael Bittner
Translational Genomics Research Institute

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

Russ Yelton
Northern Arizona Center for Emerging Technologies

Marshall Whitmire
Coconino County Environmental Economic Development Initiative

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 Academic Affairs, Dr. Karen Pugliesi. Dr. Pugliesi reports to Provost Liz Grobsmith.

AWD Advisory Board Members

Toni Badone, Superintendent
Yuma Union High School District

Jane Bristol, Director of Economic Development
City of Prescott

Leslie Dalton, Director, Clinical Education
Yuma Regional Medical Center

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

Barbara Feth, P.T., Western Region Director and
Associate National Director of Therapy Operations
HealthSouth

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

Raul Sandoval, Ed.D., Associate Dean, Enrollment Services
South Mountain Community College

Chuck Spotts, Vice Chancellor, Instruction and Student Services
Mohave Community College

George Van Otten, Strategic Planner, Homeland Security
CACI International

Jeri Williams, M.Ed., Assistant Chief
City of Phoenix Police Department

LEARN MORE

⇒ To learn more about **TRIF at NAU,** contact Dr. Laura Huenneke ,
Vice President for Research at Laura.Huenneke@nau.edu or (928) 523-4340

⇒ To find out more about **GBI**, contact Dr. Tim Porter in the Department of Physics, at Tim.Porter@nau.edu or 928-523-2540.

⇒ To find out more about **ERDENE**, contact Shelley Silbert in the office of the Vice President for Research, at Shelley.Silbert@nau.edu or (928) 523-4340

⇒ To find out more about **E-Learning**, contact Director Don Carter at Don.Carter@nau.edu, 928-523-1605. or go to 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, or call 928-523-6598, or go to 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, (928) 523-6515, or http://jan.ucc.nau.edu/~hp-p/.

NORTHERN ARIZONA UNIVERSITY

ACCESS & WORKFORCE DEVELOPMENT

NORTHERN ARIZONA UNIVERSITY

September 1,2009

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 goals. Similarly, the NAU efforts are in complete 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, dental hygienists 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 entry-level 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 state.

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Fred Hurst
Vice President, Extended Campuses
Dean of Online Learning

METRICS ($ in millions)	FY 02 Act	FY 03 Act	FY 04 Act	FY 05 Act	FY 06 Act	FY 07 Proj	FY 07 Act [1]	FY 08 Proj	FY 08 Act	FY 09 Proj	FY09 Act	FY 10 Proj	FY 11 Proj
Technology Transfer and Industry Collaborations													
Courses/Modules Sold/Brokered	0	5	0	0	0	1	0	1	0	1	0	1	1
Workforce Contributions													
Potential New Students Served													
New Teachers	250	542	807	679	773	700	910	700	1,019	750	1,058	750	750
Nurses/Health Professionals	120	266	414	464	540	400	585	500	640	500	680	600	600
Engineers with Advanced Training	20	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
Business/Non-Profit Managers	44	182	303	442	528	400	657	400	725	450	816	450	500
Curriculum Innovations													
Degree/Certificate Programs	11	19	37	41	41	40	41	42	41	44	41	46	48
Statewide Access (Rural and Urban) (Yes/No)	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
Revised Courses	75	72	105	153	176	40	206	40	225	40	244	40	40
Partnerships/Collaborations													
Community College	14	16	17	17	19	17	19	17	20	17	20	17	17
Tri-University (ASU,NAU,U of A)	3	3	3	3	3	3	3	3	3	3	3	3	3
K-12 (Schools/Districts)	30	51	119	127	127	120	127	125	126	130	125	135	140
Business/Government	2	21	42	75	80	50	80	53	85	56	89	59	61

1 Beginning FY07 reporting based on number of students eligible to enroll by program.

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 2009 Objectives and Accomplishments

Enrollments for FY 2009 continued to grow with the on-going expansion of hybrid programs, establishment of new cohorts, sustained growth in web enrollments, strategic marketing and recruiting efforts all contributed to the success of these programs.

- Programs to prepare and serve new teachers grew by 4% in FY 2009. While the prior year's rapid growth in Educational Technology leveled off, enrollment in the B.S. Elementary Education continued to grow by 20%. The B.S. in Elementary Education program is currently serving 260 teacher candidates across Arizona. Funding for full-time anchor faculty members has proven to be an effective model for growth with quality.

- Health Professions programs maintained steady growth in the BAS/BS Health Science/Community Health degrees. Currently these programs serve 228 students around Arizona. The online RN-BSN continues to be an effective way of serving students, with a 12% growth rate this year. Dental Hygiene grew by 3%, bringing the total number of students served across the health professions to 680 students, an overall growth rate of 6%.

- Programs serving business and the public sector grew by 13% in FY 2009. The Bachelor of Applied Science in Computer Technology was discontinued in favor of a technology management degree. The new degree, Bachelor of Applied Science in Technology Management, was designed in consultation with community college partners and provides students with the skills needed to lead a technology centered organization. The program will be available for students to begin in the Fall 2009 term. The Master of Administration program grew to 555 active students, after record growth the prior year. Both online and face to face models are used to deliver these popular programs for early and mid-career working Arizonans.

FINANCIAL INFORMATION

AWD	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Budget	FY2009 Actual	FY 2010 Budget	FY 2011 Budget
REVENUE											
Carry Forward	$0	$1,490,660	$2,074,249	$1,604,439	$1,579,182	$1,223,971	$738,477	$322,840	$322,840	$453,580	$0
TRIF Revenue	$3,780,774	$3,716,346	$3,958,296	$2,767,273	$2,911,225	$5,071,491	$3,000,000	$2,326,638	$2,350,016	$2,201,017	$2,197,033
TOTAL REVENUE	$3,780,774	$5,207,006	$6,032,545	$4,371,712	$4,490,407	$6,295,462	$3,738,477	$2,649,478	$2,672,856	$2,654,597	$2,197,033
OPERATING BUDGET											
Personal Services	$1,758,482	$2,309,262	$2,758,700	$2,485,637	$2,453,797	$2,973,241	$2,840,014	$2,262,765	$1,944,263	$2,295,919	$2,127,033
Operating	$531,632	$823,495	$1,636,784	$644,637	$812,639	$512,253	$575,623	$386,713	$275,013	$358,678	$70,000
Debt Svcs/Proj Buildout*	$0	$0	$0	$0	$0	$2,071,491	$0	$0	$0	$0	$0
TOTAL EXPENDITURES	$2,290,114	$3,132,757	$4,395,484	$3,130,274	$3,266,436	$5,556,985	$3,415,637	$2,649,478	$2,219,276	$2,654,597	$2,197,033

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.

* Note: FY 2009 revenue/expense reported prior to official fiscal year close.

PERFORMANCE ANALYSIS

Infrastructure: FY 2009 Objectives and Accomplishments

The following objectives were met in FY 2009:

Student Services – Arizona students can select from over 30 urban and rural locations for assistance with admission, enrollment, payment, and advising. The Distance Learning Service Center is available to support students who are unable to visit a campus or attend classes on-line. The Service Center is available by toll-free phone, email, and online chat. A survey of NAU Distance Learning Fall 2008 students reported a high student satisfaction rating. Overall, when asked to grade the job NAU Distance Learning is doing, students were very satisfied with a mean grade of 3.52 ("A"). Grades are based on an A-F scale, with "A" as the highest grade and "F" as the lowest grade

Technical Infrastructure – High-bandwidth Internet-access demand is satisfied by 200 Mbps leased connections. Internet 2 connectivity supports the national exchange of instructional and research data. The Distance Learning/Extended Campuses wide area network infrastructure (NAUNet) was upgraded with new circuits utilizing MPLS (Multiprotocol Label Switching). Server hardware was upgraded to utilize virtualization for better redundancy and recovery. Firewall security was greatly improved with a newly implemented security plan. Modem pools are maintained in rural areas to serve students.

Faculty Support – 244 web courses have been developed since FY 2003 with TRIF funding. Over 1,150 Web classes were taught during Academic Year 2008-2009 using a combination of TRIF and Extended Campuses funding with approximately 17% growth in Web enrollments.

Marketing – A comprehensive advertising campaign themed, "Everywhere you want to learn," continued to aggressively promote TRIF programs. Print, radio, web advertising, and high-quality glossy brochures were designed and produced for targeted markets. Ad-word sponsorships ensured prominent placement of TRIF programs in Google search results.

MANAGEMENT

Programmatic oversight is through the Extended Campuses of NAU with the vice president for extended campuses and dean of online learning directly responsible for activities. Due to the size of this initiative, close coordination with each program is facilitated by Extended Campuses. Fiscal management is centrally controlled to maximize the efficacy of the limited budget. Academic departments are reimbursed for expenses. Integration with ongoing operations helps ensure sustainability.

ADVISORY BOARD

The A/WD Advisory Board provides guidance on program development and student support needs. In FY09 the Board addressed issues including:

- Emerging opportunities for programs in homeland security and information management
- Curriculum for Teacher certification program serving students in the lower Colorado River region
- Collaborative efforts between University and healthcare providers to increase the number of bachelor-prepared nurses in Arizona
- Removing barriers to admission and enrollment for community college transfer students
- Consulting on faculty recruitment

AWD Advisory Board Members

Toni Badone
Superintendent
Yuma Union High School District

Jane Bristol
Director of Economic Development
City of Prescott

Leslie Dalton
Director, Clinical Education
Yuma Regional Medical Center

Gypsy Denzine, Ph.D.
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Vice Chancellor, Instruction and Student Services
Mohave Community College

George Van Otten
Strategic Planner, Homeland Security
CACI International

Jeri Williams, M.Ed.
Assistant Chief
City of Phoenix Police Department

LEARN MORE

Contact Fred Hurst, Vice President, Extended Campuses; Dean of Online Learning , at Fred.Hurst@nau.edu, or call 928-523-6598. Or Visit the Extended Campuses website at http://extended.nau.edu/

NORTHERN ARIZONA UNIVERSITY

THE ARIZONA UNIVERSITIES NETWORK

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

the POWER of 3

ASU

NORTHERN ARIZONA UNIVERSITY

THE UNIVERSITY OF ARIZONA
TUCSON ARIZONA

September 1, 2009

The Arizona Universities Network (AZUN), is an innovative, cooperative agreement between Arizona State University, Northern Arizona University, and the University of Arizona. AZUN gives students access, in one location, to many courses and programs offered online by the three universities, either individually or cooperatively. The multi-university initiative combines the strengths of each institution to bring unique educational opportunities to Arizona students in varying circumstances: place or time-bound students, those living in rural areas of the state, or students unable to reside on a university campus because of cost, family obligations, disabilities or other challenges. Students can earn an undergraduate degree, graduate degree, or professional certificate in a wide variety of fields. AZUN also serves those who desire classes for personal or professional enrichment.

AZUN students receive personalized service through a central service center and coordinators located on each university campus. Students are counseled by advisors via phone or e-mail, pay only one tuition bill, and have automatic transfer of credits once a course is completed. The innovative AZUN structure created by the Arizona Board of Regents, provides the capability for meeting both present needs and future demand as more students across the state realize the benefits of further education and seek access to their public universities.

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

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Fred Hurst
Vice President, Extended Campuses
Dean of Online Learning
Northern Arizona University

METRICS ($ in millions)	FY 05 Act	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY 08 Act	FY 09 Proj	FY 09 Act
Workforce Contributions								
Students Served								
Teachers	11	40	200	209	315	293	331	428
Nurses[1]	73	42	60	92	63	-	66	
Fire Science / Emergency Services Management	-	In Progress	50	In Progress	53	32	55	25
Law Enforcement	-	In Pro-gress[2]	50	16	53	153	55	201
Curriculum Innovations								
Degree/Certificate Programs	9(6)	9(3)	9(4)	9(3)	9(4)	8	9(4)	8
Regional/National Global Access	Yes	Yes	-	Yes	-	Yes	-	Yes
New/Revised Courses	30	16	30	13	30	9	30	16
Alternative Course Delivery (High Capacity & Short-Format)								323
Partnerships/Collaborations								
Community College Partners	17	19	19	19	19	20	19	20
K-12 Partners (schools/districts)	127	127	127	127	127	126	127	125
Out-of-State Partners	0	0	1	0	1	0	1	1
Growth Indicators								
Students Cross-Registering (per year)[2]	331	370	400	379	420	527	441	276
Course Enrollments System-Wide[3]	40,615	49,523	58,500	64,939	61,425	80,892	64,496	95,933
Courses Delivered System-Wide[3]	1,170	1,860	2,200	2,362	2,310	3,610	2,426	3,500
Programs Delivered System-Wide[3]	49	56	58	89	61	113	64	115
New Enrollments System-Wide[3]	-	8,908	9,000	15,416	9,450	15,593	9,923	15,011
Satisfaction and Quality Measures[4] (Experience Rated as Good or Very Good)	TBD	91%	-	Mean = 7.2	-	In Progress	-	

[1] Support of Nursing programs continues through the TRIF Allied Health initiative.

[2] Effective FY09, cross-registration counts reflect duplicated headcount by home campus; prior year counts included students at home & provider campuses.

[3] Enrollment, course, and program counts are for electronically-delivered courses.

[4] Effective FY09, satisfaction measures reported in narrative.

PERFORMANCE ANALYSIS

Program Development: FY 2009 Objectives and Accomplishments

Teacher Education: The Early Childhood Education and the B.S. Elementary Education programs in South Mountain, North Valley, and East Valley more than doubled in size. A total of 139 students are being served at these locations. Two hundred students in Tucson are training to become Elementary teachers. Students have graduated from Paradise Valley and Scottsdale. A full time faculty member successfully launched a cohort program in Elementary/ Special Education in partnership with Flowing Wells Unified School District.

Law Enforcement: Degrees targeted toward law enforcement continue to attract students around the state. Over 200 students are pursuing degrees in the field of justice administration, seventy of which are pursuing the Bachelor of Applied Science (B.A.S) in Administration of Justice. Students in this program attend two years at a community college which greatly reduces the overall cost of a four-year degree.

Fire Science: The B.A.S. Fire Science emphasis transitioned to the Emergency Services Administration emphasis this year to meet both firefighter needs and broader emergency responder requirements. Courses are developed for online delivery, and the program currently serves 25 students.

Speech/Language Pathology Assistant Certificate: A full-time faculty member based at the North Valley office teaches online courses for the certificate program which serves both the education and nursing sectors across the state. The program has grown from 37 to 81 students.

Leadership and Public Management: The Leadership and Public Management emphases in the Master of Administration continue to be popular choices for those professionals seeking advanced training or credentials. The program requires five years of work experience and is designed for mid-career professionals seeking to strengthen and update their administration skills The program is available in both a fully online format, and in locally offered cohorts in Maricopa and Pima counties.

FINANCIAL INFORMATION

AZUN	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Budget	FY2009 Actual	FY 2010 Budget	FY 2011 Budget
REVENUE											
Carry Forward	$0	$0	$0	$1,615,559	$2,534,652	$3,115,813	$2,938,105	$2,313,450	$2,313,450	$1,453,353	$32,810
TRIF Revenue	$0	$0	$0	$1,228,962	$2,034,906	$2,142,705	$2,108,279	$1,753,160	$1,770,777	$1,658,504	$1,655,502
TOTAL REVENUE	$0	$0	$0	$2,844,521	$4,569,558	$5,258,518	$5,046,384	$4,066,610	$4,084,227	$3,111,857	$1,688,312
OPERATING BUDGET											
Personal Services	$0	$0	$0	$2,983	$344,531	$957,851	$1,195,755	$1,534,740	$1,252,125	$1,381,102	$712,025
Operating	$0	$0	$0	$306,886	$1,109,214	$1,362,562	$1,037,179	$2,087,150	$878,749	$1,197,945	$476,287
Debt Service	$0	$0	$0	$0	$0	$0	$500,000	$500,000	$500,000	$500,000	$500,000
TOTAL EXPENDITURES	$0	$0	$0	$309,869	$1,453,745	$2,320,413	$2,732,934	$4,121,890	$2,630,874	$3,079,047	$1,688,312

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.

* Note: FY 2009 revenue/expense reported prior to official fiscal year close.

PERFORMANCE ANALYSIS

Program Development Continued...

Development and Delivery of Shortened-Format Web Courses: The number of web courses in the 7-week format increased from 71 to 74 courses from FY08 to FY09, including four new course developments. Courses are representative of a range of university academic programs at both the undergraduate and graduate levels.

Development and Delivery of High Capacity Undergraduate Web Courses: Support mechanisms and new approaches have been developed to ensure high capacity in critical web-delivered courses. High capacity in courses is provided by lead faculty and supported by teaching assistants. Multiple sections of the same course are taught by instructors under the mentoring and supervision of regular faculty. Effective enrollment management strategies maximize web course capacity. The number of high capacity sections offered grew from 196 to 249.

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 courses that would be redundant with the student's prior training and experience. In 2008, an agreement made with the Service-Persons Opportunity College (SOC) provides opportunities for armed-forces personnel to transfer in non-credit courses from their military careers. Impediments to expansion of competency-based and experiential learning include a lack of administrative infrastructure, academic standards, and cost implications.

Infrastructure: FY 2009 Objectives and Accomplishments

AZUN Portal: The AZUN Web portal project was designed to interconnect each university's student information system (SIS). Technical staff at the AZUN and university levels continue to meet to enhance the Portal's capacities and to develop new functionalities.

The construction of an addition to the Communications building on the Northern Arizona University campus to house AZUN and Extended Campuses functions started in July of 2008 and is on schedule for completion by September 2009. Delivery of science and math courses directly to high school students required equipping the new studio in the AZUN and distance learning building addition. Equipment is on order for delivery by the September occupancy date for the facility.

In 2008-2009 AZUN funding was used for a pilot implementation of a fiber-based data network that eliminated unreliable data systems on the reservations.

In response to state legislature funding reductions, NAU chose to phase out instructional videoconferencing Fall 2009 saving $1.5 million per year. Web-conferencing allows for the same basic functionality with added convenience for students and faculty.

LEARN MORE

Contact Fred Hurst, Vice President, Extended Campuses and Dean of Online Learning, at Fred.Hurst@nau.edu, or 928-523-6598. Or visit the AZUN website at http://www.azun.net.

Infrastructure continued...

Student Services: Prospective students are offered assistance with navigating the application process at the institution of their choice (NAU, ASU, UA) by phone, email, and live chat. Arizona students can select from over 30 urban and rural locations for assistance with admission, enrollment, payment, and advising. The Service Center is available by toll-free phone, email, and online chat.

AZUN student satisfaction: Representatives at ASU, NAU, and UA collaborated to develop and implement a revised student satisfaction survey for FY09. The survey, intended to improve the quality of information obtained from respondents, was distributed electronically to cross-registered students in the Spring 2009 term. Of the respondents, 94% indicated that they would recommend AZUN to a friend. Comments about the value of AZUN were mostly favorable, stressing convenience, broader course options, and ability to access faculty expertise at other campuses. While 40% of the respondents felt that the registration process was easy to navigate, 35% described it as difficult. Continued information gathering and student outreach will facilitate improvements to the student service processes.

Articulation: Each of the universities has program information published on the AzTransfer.com website. This tool helps transfer students obtain accurate information about requirements and how courses apply to degree programs at each institution. When a student completes an AZUN class, the transcript is automatically sent to the student's home institution and posted as transfer credits on the student's transcript. Access to AzTransfer.com is available through the AZUN Web Portal.

Technology: Server hardware was upgraded to utilize virtualization for better redundancy and recovery. Firewall security was greatly improved with a newly implemented security plan. Three software enhancements that improved the student experience on the AZUN portal site were implemented.

Marketing: In the fall of 2008, AZUN launched a campaign to inform NAU, UA, and ASU students of cross-registration opportunities which included multi-channel advertising on the three state university campuses: TV, print, outdoor, radio, and distribution of collateral promoting cross-registration opportunities on all three campuses. In the spring of 2009, AZUN began a direct marketing effort to Arizona High School guidance counselors.

THE ARIZONA UNIVERSITIES NETWORK

The Arizona Board of Regents gateway to quality distance learning

MANAGEMENT

Programmatic oversight is provided by the Extended Campuses of Northern Arizona University with the vice president for extended campuses and dean of online 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 final oversight.

e-Learning

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

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 Center supports the TRIF initiative in the following ways:

- Educates faculty and students in methods and skills required by today's information technology infused economy,
- Develops, in collaborative support with faculty, 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 courses, while we continue to study, assess, and where appropriate, promoted across the curriculum.

The e-Learning Center's programs actively involve faculty and students in the use of technology. For over a year now all courses at NAU have an online component available in our Learning Management System, Blackboard Vista. The course shells are used to deliver online courses and to allow hybrid delivery and to enhance face to face courses. 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. showcases highlighting faculty achievements in the use of instructional technologies, 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, 4) faculty curriculum redesign supported by mini-grants, and 5) faculty research to examine effective practices that support student success.

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Don Carter, e-Learning Director

METRICS	FY 02 Actual	FY 03 Actual	FY 04 Actual	FY 05 Actual	FY 06 Actual	FY 07 Projected	FY 07 Actual	FY 08 Projected	FY 08 Actual	FY 09 Projected	FY 09 Actual	FY 10 Projected	FY 11 Projected
Work force Contributions													
Number of new Web courses developed and offered	125	101/140	121	141	22/471	100	78	95	67	90	63	85	80
Number of new Hybrid courses developed						15	2	25	9 [a]	35	11 [a]	45	55
Number of new IT enhanced courses developed	0	32	42	53	7	20	80	25	>1000 [b]	30	15 [b] > 1,000	35	40
Number of courses redesigned						15	5	20	12	25	22	30	35
Number of faculty participating in Web development	150	117	155	126	241	200	325	225	210	250	397 [c]	300	350
Number of student enrollments in online courses	7,110	9,476	10,133	12,381	14,116	12,500	20,526	12,750	31,568	13,000	35,637 [d]	13,500	14,000
Number of student enrollments in hybrid courses						1,000	36	1,300	1350	1,600	1,537 [a]	2,000	2,500
Number student enrollments in enhanced courses						2,000	2769	3,000	>10,000 [e]	4,000	>13,500 [e]	5,000	6,000
Increase in student success in Web courses		5%	9%	16%	5.3% decrease	5%	5%	5%	0%	5%	6% [f]	5%	5%
Increase in student success in enhanced & redesigned						5%	First Year Baseline	5%	0% [g]	5%	0% [g]	5%	5%
Percentage of students satisfied with Web learning	0	84%	89.2%	87%	87%	91%	86%	92%	96%	93%	90%	94%	95%
Number of graduates with technical literacy skills	1,500	889	1,633	1,919	2,238	2,000	1995	2,050	2,100	2,100	2,608	2,150	2,200
Number of graduates with advanced technical literacy						1,000	282	1,200	625	1,500	1,425	1,600	1,700
Partnerships													
Number of private sector partnerships	0	0	0	2	2	1	2	1	2	1	1	1	1
Number of scholarly publications/conference presenta-						3	8	5	15	7	9	10	10

[a] These measures depend on course delivery mode descriptors in the class schedule. The new policy with "hybrid" mode will be in place for Fall 2009.

[b] 60% of all courses at NAU are "IT enhanced", see [e]. 15 courses were highly supported, there are over 1,000 other courses using varying levels of support from e-Learning.

[c] Of the 397 faculty coming to e-Learning for training in FY09, the most popular topics were Bb Vista (171), Podcasting (82), and webpage development (74).

[d] 23,935 enrollments were Statewide Students and of those, 13,764 were enrollments seeking online degrees.

[e] Since Fall of 2006 all courses are provided a Blackboard Vista shell. More than 60% of the faculty use the online course shells. Thus an estimate that more than 60% of the 22,500 students, or 13,500 use such a resource is reasonable.

[f] The DFW rate decreased from 15.2% to 14.3%, a 6% improvement. (the 0.9 decrease is 6% of 15.2)

[g] The DFW rate remained constant but overall the gradepoint average did increase

PERFORMANCE ANALYSIS

NAU's e-Learning Initiative has a clear focus on development of faculty and student information technology fluency resulting from infusion of technology across curriculum. Through e-Learning activities, NAU prepares graduates for the 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.
  - ⇒ Recent focus is the enhancement and redesign of large enrollment introductory traditionally delivered courses including : Anthropology, Art, Biology, Chemistry, Communication, Forestry, Geology, Mathematics, Physics, Psychology, Sociology, and Spanish.
  - ⇒ Redesigns initiated or supported by e-Learning include 1) classroom personal response systems (clickers), 2) collaboration activities using wikis, blogs and discussion boards, and 3) alternative content delivery using podcasts and media to capture lectures or to deliver mini-lectures.
- Advances in student centered e-Learning occur through research and development (R&D) activities. New technologies, improved teaching practices, and quality standards centered on learning in a technology rich environment, are core to the e-Learning Initiative.
- 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 including those offered through the Arizona Universities Network (AZUN).
  - ⇒ DFW (Drop, Failure, Withdrawal) rates are one measure of course effectiveness. In 2009, the DFW rate in web courses was 14.3%.
  - ⇒ A 13% 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.
  - ⇒ Over 170 faculty new to using web technology to enhance their traditional courses.
- Impact of the e-Learning Initiative is measured by the number of students with basic and advanced information technology fluency. Multiple indicators are used including direct observation, questionnaires, test score data, and interviews or focus groups.
- Other programs developed and supported by the e-Learning Center include:
  - ⇒ Ongoing development support for faculty by a team of instructional, media, and technology designers,
  - ⇒ 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

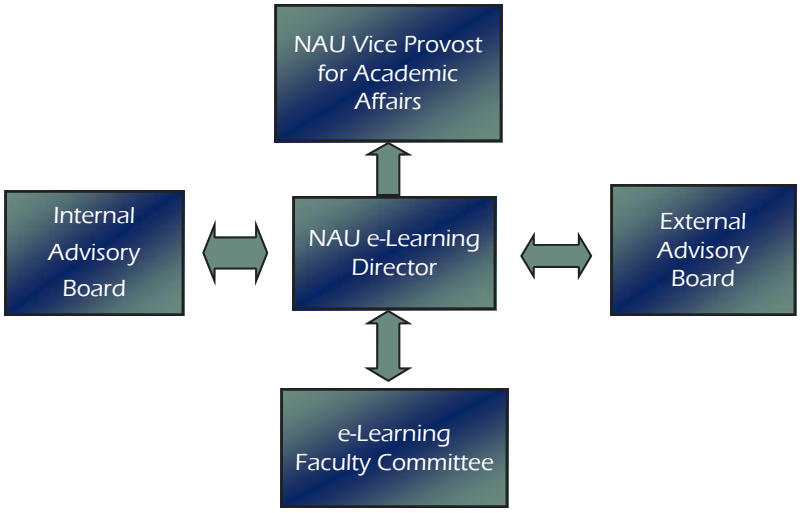
	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY2008 Actual	FY 2009 Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE											
Carry Forward	$0	$674,138	$637,033	$658,826	$1,197,355	$456,204	$312,232	$95,436	$95,436	$15,423	$0
New TRIF Revenue	$1,354,355	$1,161,953	$1,704,522	$2,160,000	$2,272,361	$1,897,534	$1,722,466	$1,403,738	$1,417,843	$1,327,947	$1,325,544
TOTAL REVENUE	$1,354,355	$1,836,091	$2,341,555	$2,818,826	$3,469,716	$2,353,738	$2,034,698	$1,499,174	$1,513,279	$1,343,370	$1,325,544
OPERATING BUDGET											
Personal Services	$567,521	$1,103,269	$1,310,577	$1,525,599	$1,697,066	$1,729,924	$1,538,100	$1,144,023	$1,369,059	$1,228,132	$1,190,000
Operating	$112,696	$95,789	$199,959	$298,244	$1,316,446	$311,582	$401,162	$355,151	$128,797	$115,238	$135,544
TOTAL EXPENDITURES	$680,217	$1,199,058	$1,510,536	$1,823,843	$3,013,512	$2,041,506	$1,939,262	$1,499,174	$1,497,856	$1,343,370	$1,325,544

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 "e" in e-Learning means more than electronic or online courses. The "e" represents 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.



MANAGEMENT

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

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.

Membership includes the e-Learning Center Director, the Director of Faculty Development, six faculty (one from each college), two students (one on the Mountain Campus and one Distance Learning), and representatives from each of the following: Academic Chairs Council, Cline Library, Council of Deans, Distance Learning, Information Technology Services, and the Provost's Academic Computing Advisory Committee.

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.

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 for redesign, and reviewing internal grant projects.

LEARN MORE

Contact Don Carter, Director of the NAU e-Learning Initiative, at 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, 2009

ERDENE

In a time of economic challenge, the intertwining of economic, environmental and community concerns becomes increasingly critical. Environmental Research, Development and Education for the New Economy (ERDENE) encourages creative thinking and inspired partnerships to bring together university researchers with business and community members, sparking a unique integration of environmental technologies, financial performance, and leadership development. ERDENE meets today's challenges with solutions at once bold and practical.

At Northern Arizona University, ERDENE emphasizes five major areas of the university's environmental research strengths: ecological restoration, renewable energy technologies, water resources, applied research for sustaining rural communities, and comprehensive monitoring and management of complex systems. The program also builds on NAU's strong connection with rural Arizona and success in building collaborative partnerships with private, public, tribal and non-profit entities.

Paul Heinrich conducts weather station maintenance on the Babbitt Ranches, Flagstaff, AZ Northern Arizona

With a focus on economic development and sustainable systems, ERDENE promotes environmental, economic and community health to benefit all Arizona citizens.

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Shelley Silbert
Director of ERDENE and Strategic Environmental Initiatives

PERFORMANCE ANALYSIS

METRICS ($ in millions)	FY 02 Act	FY 03 Act	FY 04 Act	FY 05 Act	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY08 Act	FY 09 Proj	FY09 Act	FY 10 Proj	FY 11 Proj
Return on Investment													
Federal and State Funds	$5.50	$4.30	$4.40	$12.90	$3.30	$5.00	$8.30	$3.90	$7.59	$4.20	$9.40	$4.50	$4.80
External Funding, Other	$1.00	$0.70	$1.00	$1.00	$0.50	$0.70	$0.47	$1.40	$3.30	$1.10	$2.80	$1.20	$1.30
Qualitative Returns Including Presentations & Publications	121	180	138	305	119	150	221	150	3127 (includes web-site access)	160	114	170	180
Technology Transfer													
Products Generated and in the Marketplace	0	0	49	6	12	3	5	3	4	6	0	8	10
Business Spinoffs	1	0	1	1	1	0	4	0	2	1	0	2	3
Patent Applications Generated	1	0	0	0	0	0	1	1	4	2	2	3	4
Conferences Sponsored	14	19	21	28	26	3	21	5	42	10	2	15	20
Business Expansions	2	1	5	16	5	0	4	1	8	2	0	3	4
Work Force Contributions													
Graduate/Postdoc Students in Pipeline or Graduated	56	87	102	35	38	65	32	62	104	65	56	68	70
High End Baccalaureates in Specific Disciplines	38	27	47	23	15	8	3	6	21	6	22	6	6
Baccalaureates Produced in Related Disciplines	n/a	n/a	n/a	n/a	n/a	50	15	42	N/A	45	10	48	50
Certificates Granted	0	0	3	73	0	5	0	5	0	5		5	5
Undergrad Students in Pipeline	26	126	63	40	45	50	78	55	325	60	83	65	70
Continuing Ed Professionals	85	312	1361	142	265	250	42	130	142	140	29	150	160
Specific Curriculum Innovations													
New Programs such as Certificates (full time students)	3	1	1	0	2	0	2	1	2	1		1	1
Revised Courses	10	14	16	22	6	2	6	3	7	4	4	4	4
New Courses (full time students)	2	9	29	31	12	2	5	2	3	3	2	3	3
New Programs – Participating Professionals	0	0	0	0	9	0	4	2	0	2		2	2
Partnerships													
Community College 2+2 Programs	2	9	7	8	8	2	6	4	5	6	2	8	10
Tri-University (ASU, NAU, UofA)	4	6	7	10	9	5	2	8	8	12	12	15	18
Industry/Private Sector Collaborations	17	73	58	79	48	35	55	38	81	40	6	42	45
Community-based (including tribes)	34	58	51	60	76	35	78	38	45	40	8	42	45
Regional, Nat'l, International Research and Linkages	20	41	54	72	69	35	75	38	75	40	12	42	45

PERFORMANCE ANALYSIS

Highlights of ERDENE accomplishments by NAU investigators in FY09 include:

Proof of concept for a rugged, lightweight mass spectrometer capable of instant field analysis. A potential economic use under discussion is identification of stressed pine trees susceptible to bark beetle infestations.

Assessment of the potential for renewable energy development, particularly wind, across the state.

A feasibility analysis of the native plant and seed market, already distributed to 85 business and agency representatives from 45 different organizations.

A collaboration between NAU and ASU to investigate the impact of exposure to complex chemical mixes on behavior, through the study of endocrine disruption in amphibians and birds.

Undergraduate students funded through the National Science Foundation examine bark beetle damage on piñon pine.

FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY2008 Actual	FY 2009 Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE											
Carry Forward	$0	$175,540	$224,067	$296,812	$476,956	$667,386	$572,386	$611,482	$611,482	$709,599	$0
New TRIF Revenue	$1,450,500	$1,551,412	$1,681,405	$1,977,600	$2,080,472	$1,872,092	$1,829,165	$1,638,036	$1,654,496	$1,549,595	$1,546,791
TOTAL REVENUE	$1,450,500	$1,726,952	$1,905,472	$2,274,412	$2,557,428	$2,539,478	$2,401,551	$2,249,518	$2,265,978	$2,259,194	$1,546,791
OPERATING BUDGET											
Personal Services	$1,062,225	$1,260,419	$1,426,244	$1,639,348	$1,425,694	$1,902,726	$1,437,357	$1,853,292	$1,203,103	$2,098,999	$1,437,791
Operating	$212,735	$242,466	$224,416	$301,376	$464,348	$64,366	$352,712	$396,226	$353,276	$160,195	$109,000
TOTAL EXPENDITURES	$1,274,960	$1,502,885	$1,650,660	$1,940,724	$1,890,042	$1,967,092	$1,790,069	$2,249,518	$1,556,379	$2,259,194	$1,546,791
ROI *	5.1 : 1	3.4 : 1	3.0 : 1	7.2 : 1	2.0 : 1	3.0 : 1	7.4:1	3.2 : 1	4.2:1	3.3 : 1	3.4 : 1

* New ROI methodology was 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

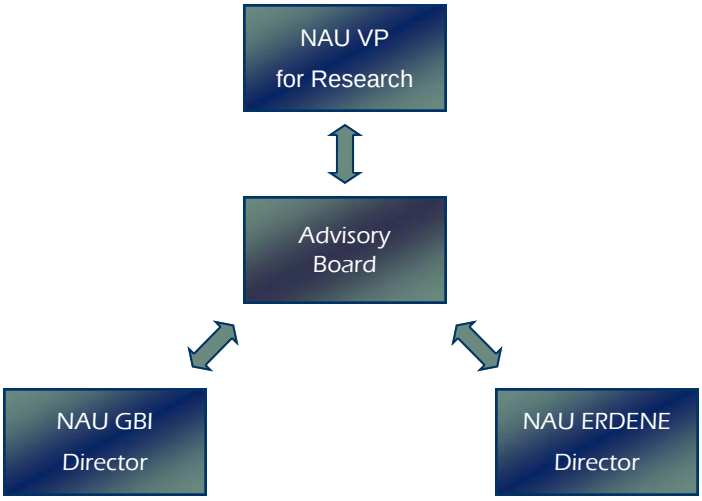
ERDENE goals specifically include:

- 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.

Preparing to model the carbon content of wood products from forest thinning

MANAGEMENT

Shelley Silbert, Director of Strategic Environmental Initiatives and ERDENE, reports to Dr. Laura Huenneke, Vice President for Research, for TRIF related activities.



The Research and Development Advisory Board was formed to oversee Growing Biotechnology (GBI) and Environmental Research, Development, and Education for the New Economy (ERDENE) Initiatives. This board consists of NAU deans, faculty, and professionals with expertise in environmental and/or biotechnology areas.

Michael Bittner
Translational Genomics Research Institute

Russ Yelton
Northern Arizona Center for Emerging Technologies

Barry Gold
Gordon and Betty Moore Foundation

David LaRoche
U.S. Environmental Protection Agency

Paul Jagodzinski
Dean, NAU College of Engineering, Forestry and Natural Sciences

Mary O'Connell
New Mexico State University Plant and Environmental Science Department

Thomas Whitham
NAU Department of Biological Sciences

Marshall Whitmire
Coconino County Sustainable Economic Development Initiative

LEARN MORE

- Contact Shelley Silbert at (928) 523-7635 or Shelley.Silbert@nau.edu or visit any of the following websites to learn more about individual initiatives:
- 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

GROWING BIOTECHNOLOGY

September 1, 2009

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. Strengths include infectious diseases, medical instrumentation, forensic genetics, cancer, musculoskeletal and cardiopulmonary rehabilitation, endocrine systems, biomaterials, and respiratory failure. GBI is also expanding specific funding opportunities for product development based on previously funded research.

Research areas supported by GBI and SABRE focus primarily on strategic initiatives identified in the 2007 Arizona Bioscience Roadmap, and specifically areas identified in the 2008 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.

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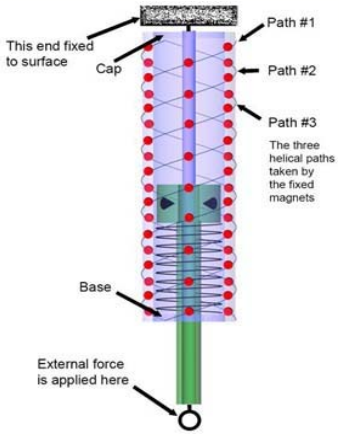
Dr. Tim Porter, Director
Growing Biotechnology (GBI)

PERFORMANCE ANALYSIS

METRICS ($ in millions)	FY 02 Act	FY 03 Act	FY 04 Act	FY 05 Act	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY08 Act	FY 09 Proj	FY09 Act	FY 10 Proj	FY 11 Proj
Return on Investment													
External Funding Federal, State & Local	$1.40	$6.30	$5.60	$1.30	$4.20	$2.50	$4.10	$2.80	$3.10	$3.10	$3.40	$3.40	$3.70
External Funding Other	n/a	n/a	n/a	n/a	$0.90	$0.30	$0.05	$0.50	$0.00	$0.50	$0.30	$1.00	$1.00
Number of Scholarly Publications	12	0	59	38	47	20	65	30	10	30	12	40	40
Technology Transfer													
Patent Applications Generated	1	2	2	1	3	2	1	2	1	2		2	2
Products Generated and in the Marketplace	0	5	0	2	1	1	0	2	0	1		2	2
Business Expansions	0	0	0	2	1	1	1	1	0	1		1	1
Technology Transfer: startup companies created	0	2	1	0	1	0	1	1	0	0		0	1
Industry Partnerships	0	2	2	2	8	1	4	1	5	2	2	1	2
Economic Development													
Incubation/Formation of Biotech Concerns in Flagstaff/Northern Arizona	0	0	0	2	2	0	0	0	0	1		1	2
Work Force Contributions													
Graduate/Postdoc Students in Pipeline	60	62	60	25	29	10	26	20	24	20	5	25	30
Undergraduate Students with Research Experience	80	79	43	53	90	70	41	80	10	100	25	110	125
M.S./Ph.D. Graduate Increases	1	12	5	8	10	3	0	3	0	3		3	3
Specific Collaborations													
New Research Collaborations	6	29	3	17	28	2	13	2	10	5	10	5	7

RECENT ACCOMPLISHMENTS

- Recent research in the Nishikawa lab has focused on the muscle protein titin, and mechanical models of how this important muscle component functions within humans and animals. Understanding and modeling the interactions of the various muscle proteins may lead to advanced, human-engineered actuators that perform mechanical work using the same principles found within our muscles, leading to new artificial muscle devices. Work by Nishikawa and others has recently led to provisional patent applications in this area.



Simple mechanical model of muscle protein titin (provisional patent application).

- Infectious biofilms may play a role in numerous human diseases. The Leid lab at NAU has been studying infectious biofilms related to tuberculosis and to infections that accompany cystic fibrosis. Also, recent collaborative work has led to the development of lateral-flow testing devices (similar to OTC pregnancy tests) that detect the presence of dangerous biofilms. This work has led to 4 pending patents on the technology.

- GBI has funded the recent purchase of a ICPMS mass spectrometer to be operated in the Ketterer analytical laboratory. This instrument allows for high resolution analysis of dangerous trace metals in the environment, with part-per-trillion sensitivity. It is also used for high-resolution quantification of various proteins and biomolecules. Both undergraduate and graduate students will receive hands-on training on the

ICPMS mass spectrometer for trace analysis and student training in mass spectrometry.

- Work in the Gage laboratory focused on specific molecular targets for antibiotic drug development has resulted in a new intellectual property disclosure and provisional patent application.

FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY2008 Actual	FY 2009 Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE											
Carry Forward	$0	$363,216	$510,270	$200,490	$353,276	$341,247	$342,851	$216,763	$216,763	$66,097	$0
New TRIF Revenue	$967,002	$1,123,132	$817,501	$768,000	$807,951	$918,732	$533,507	$300,551	$303,571	$284,324	$283,809
TOTAL REVENUE	$967,002	$1,486,348	$1,327,771	$968,490	$1,161,227	$1,259,979	$876,358	$517,314	$520,334	$350,421	$283,809
OPERATING BUDGET											
Personal Services	$216,402	$377,561	$706,203	$696,382	$345,031	$516,128	$208,418	$168,258	$174,182	$223,597	$170,000
Operating	$387,384	$598,517	$603,157	$67,366	$474,949	$400,999	$451,177	$349,056	$280,055	$126,824	$113,809
TOTAL EXPENDITURES	$603,786	$976,078	$1,309,360	$763,748	$819,980	$917,127	$659,595	$517,314	$454,237	$350,421	$283,809
ROI *	5.1 : 1	3.4 : 1	3.0 : 1	7.2 : 1	2.0 : 1	3.0 : 1	12.3:1	3.2 : 1	4.2:1	3.3 : 1	3.4 : 1

* New ROI methodology was 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..

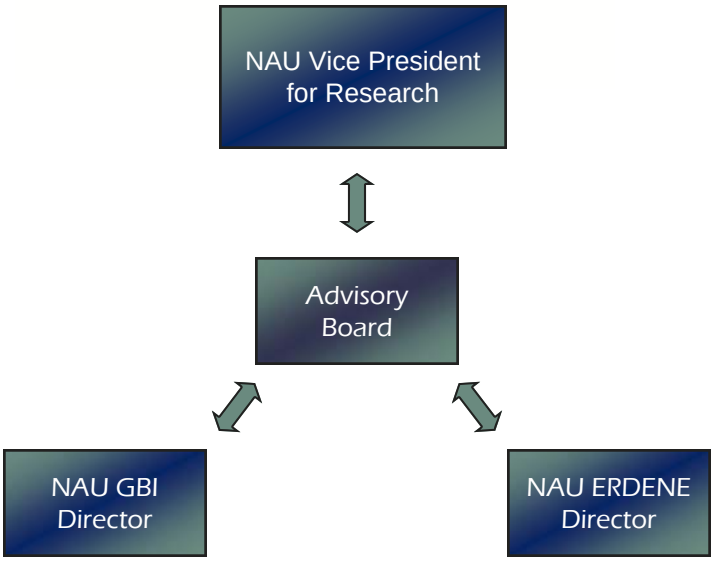
Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

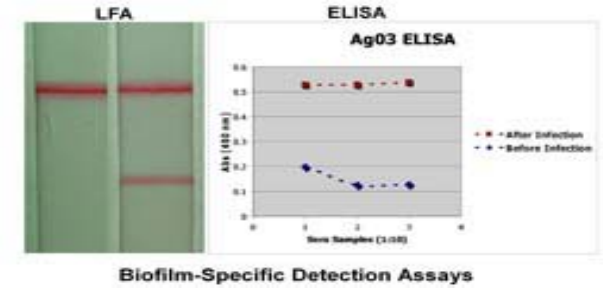
GOALS

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 Center for Emerging Technologies in recruiting and developing new biotechnology business in Northern Arizona.
- Create and refine courses in biotechnology and related fields, and update instrumentation 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.





Biofilm-Specific Detection Assays

New lateral flow detection for infectious biofilms (4 patents pending).

MANAGEMENT

GBI's director, Dr. Tim Porter, reports to Dr. Laura Huenneke, Vice President for Research, for TRIF related activities. Research initiatives within GBI report to Dr. Porter.

ADVISORY BOARD

The Research and Development Advisory Board was formed to oversee Growing Biotechnology (GBI) and Environmental Research, Development, and Education for the New Economy (ERDENE) Initiatives. This board consists of NAU deans, faculty, and professionals with expertise in environmental and/or biotechnology areas.

Michael Bittner
Translational Genomics Research Institute

Russ Yelton
Northern Arizona Center for Emerging Technologies

Barry Gold
Gordon and Betty Moore Foundation

David LaRoche
U.S. Environmental Protection Agency

Paul Jagodzinski
NAU College of Engineering, Forestry and Natural Sciences

Mary O'Connell
New Mexico State University Plant and Environmental Science Department

Thomas Whitham
NAU Department of Biological Sciences

Marshall Whitmire
Coconino County Sustainable Economic Development Initiative

NORTHERN ARIZONA UNIVERSITY

LEARN MORE

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

HEALTHCARE PROGRAM EXPANSION

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

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 complement the professional medical / health program degrees offered by UA, ASU, and in the new College of Medicine in Phoenix. The North Phoenix building, just off I-17 has consolidated all of NAU's current operations in Maricopa County and provides a place to implement the Health Care Program Expansion plan.

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This is the third year of implementation of health care expansion initiatives. . The national economic situation in general, and the reduction in TRIF funding in particular has forced us to carefully consider the viability of each programs. As a consequence, we will be reducing support of some programs and concentrating our diminished resources in those areas providing the most benefit for the investment.

The goal of this TRIF Strategic Initiative has been to expand access to and availability of *existing* health care programs in Arizona through a three-pronged approach:

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. Increase the availability of degree completion programs for students receiving technical health care degrees from community colleges.

School of Nursing

STRATEGIES AND GOALS

Here we review progress and lessons learned over the past three years:

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

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

For FY 2006, the current entry-level Doctorate of Physical Therapy (DPT) program admitted cohort of 40 students annually. For FY08, through the use of expansion dollars to hire an additional faculty member, a cohort of 48 was admitted — a 25% increase. The program continues to admit this larger cohort.

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 first AAS degree completion program was with Gateway Community College's Diagnostic Medical Imagining Training program. Building on planning done with the help of an ARRO grant and using dollars from this initiative to hire an additional faculty and an additional staff member, NAU now has partnerships offering an on-line AAS-to-BS degree in Respiratory Care, Physical Therapy Assisting, Surgical Technology, Paramedic Care and Medical Assisting. The number of students eligible to enroll in these programs has increased by 33% (to over 200) in the past year, and we are starting to see program graduates.

Goal #3: 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 hired a clinic director and an additional faculty member. NAU also configured courses specifically to allow a 7-person cohort of students in NAU-Yuma to complete the prerequisites needed to enroll in the master's degree. All of these students have now enrolled in the program. The university has invested in additional faculty for the Master's program. All of these changes have led to the recent re-accreditation of the 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 has expanded the bachelor's-level program in Athletic Training from 16 students annually, to 24 students in 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.

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

The Post-Professional Doctor of Physical Therapy Program , located in NAU's North Phoenix facility, is a 36 credit hour program that enable licensed professionals to attain doctoral status. This program has shown limited growth, and will be given a few more years to achieve stability. One side benefit of having the program in Phoenix is in the growth in the availability of Valley-based internships for Flagstaff students, sparked by having a faculty member on the ground.

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

The "on-the-ground" BSDH completion program has attracted over twenty students, but is not producing the kind of returns that warrant program continuation. The program will be discontinued after the current cohort has completed, but the on-line completion program remains available.

STRATEGIES AND GOALS

Continued from page 2

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

Investment in the nursing program in Tucson has paid big dividends — the program is filled to capacity, and admits 40 students per year. The program has been relocated to NAU's North Tucson facility which consolidates all faculty, classroom and clinical facilities in a single place. TRIF TSI funds have enabled significant renovation of the facilities at the site, and acquisition of simulation equipment which provides an optimal learning experience for Tucson nursing students. Legislative Allied Health funding provides additional support for this program.

In addition, Northern Arizona University's School of Nursing strategically partnered with Yuma Regional Medical Center to create a four-year nursing bachelor's program centered at YRMC. Core faculty are being recruited, and the program admits 20 students per year. The first group of students from this program will graduate in May, 2010.

These programs complement the university's successful nursing satellite programs on the Navajo reservation. Enrollment in the BSN program at statewide locations has nearly quintupled (to approximately 200) since Fall, 2006.

Resources from the Health care program initiative carryforward balance are also being used to sustain TRIF Access Workforce Development programs in nursing which would otherwise have been curtailed due to revenue shortfalls.

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

Athletic Training and Education Program

PERFORMANCE ANALYSIS

METRICS	FY 02 Act	FY 03 Act	FY 04 Act	FY 05 Act	FY 06 Act	FY 07 Proj	FY 07 Act	FY 08 Proj	FY 08 Act	FY 09 Proj	FY 09 Act	FY 10 Proj	FY 11 Proj
Program Enrollments								104	205	168	420	228	238
Degree Awards									71	123	64	166	186

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.

FINANCIAL INFORMATION

	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Rev Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE								
Carry Forward	$0	$0	$1,149,999	$2,128,040	$2,099,386	$2,099,386	$1,278,118	$0
New TRIF Revenue	$0	$1,149,999	$1,010,206	$936,398	$818,043	$826,263	$773,875	$772,474
TOTAL REVENUE	$0	$1,149,999	$2,160,205	$3,064,438	$2,917,429	$2,925,649	$2,051,993	$772,474
OPERATING BUDGET								
Personal Services	$0	$0	$0	$659,318	$1,994,664	$1,305,631	$855,600	$336,005
Operating	$0	$0	$32,165	$305,734	$922,765	$341,900	$1,196,393	$436,469
TOTAL EXPENDITURES	$0	$0	$32,165	$965,052	$2,917,429	$1,647,531	$2,051,993	$772,474

Communication Sciences and Disorders

With an Executive Dean in place since January, 2008 and a new Dean of Nursing in place, the College of Health and Human Services is prepared to move forward in health care education.. ABOR's funds for expanding existing health care programs, the state legislature's allocation for new programming and the SPEED and TRIF dollars that will be used to build a new Health Professions facility on the Flagstaff campus are all facilitating progress.

Northern Arizona University is prepared to bring up new programs at the North Phoenix facility while waiting for the Phoenix Medical Center complex to come to fruition. Faculty are in place and students are enrolling. A new biomedical sciences program in the Department of Biological Sciences, complementing these efforts, attracted over 100 students in AY2009..

LEARN MORE

For on-campus programs, contact Leslie Schulz, Executive Dean, College of Health & Human Services at 928.523.4331.

For off-campus programs, contact Fred Hurst, Vice President for Distance Learning Initiatives at 928.523.4212.

NORTHERN ARIZONA UNIVERSITY

STATEWIDE EXPANSION

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

NAU'S STATEWIDE EXPANSION

Northern Arizona University has a long history of providing Arizonans with access to higher education in their home communities. While Northern Arizona University 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 entered into a long-term lease of a high profile commercial building on I-17 between Bell and Greenway Roads. Signage is clearly visible from I-17 to the north, south, and east. The North Valley continues to be an anchor facility allowing Northern Arizona University to:

Northern Arizona University—North Valley

- Supply classroom space that is adult-oriented and equipped with the latest technology
- Provide access to technology to complete web courses
- Offer classes in evening and weekend formats to accommodate full time working students
- House full time faculty to provide leadership and quality assurance for programs and enhance face to face interaction with students

The TRIF monies have funded lease payments and operational expenses including high speed data connections for voice, video, and data, as well as other information technology equipment. This infrastructure supports a number of highly successful programs to help meeting Arizona's workforce needs for health professionals, teacher education, and managers in business and non-profit organizations.

The allocated and requested TRIF funding was 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
5. Optimize University Resource Acquisition and Work Environment

CURRENT AND FUTURE ACADEMIC PROGRAMS

	Chandler Gilbert	East Valley	Estrella Mountain	GateWay	Glendale	Mesa	North Valley	Paradise Valley	Phoenix	Scottsdale	South Mountain	Tucson	Tucson North[1]	West Valley
Unduplicated Campus Headcount	130	1100		6	81	137	703	275	57	287	52	947	295	396
Faculty	1	13			2		11	2		3	2	12	10	1
Amenities														
Conference Room Space		X					X						X	
Computer Lab		X					X					X	X	X
Dedicated Classroom Space		X					X	X		X	X		X	
Student Lounge		X					X							
Café							X							
Practicum Lab							X					X		
VC classroom		X					X	X		X	X	X	X	X
Wireless internet throughout facility		X					X							
Full-time Financial Aed Counselor							X					X		
Full time advisor		X				X	X	X		X		X		X
Full time program coordinator	X	X	X	X	X	X	X	X	X	X	X	X	X	
Nursing bed lab													X	
Sim Man lab													X	
Facility Size (sf)	100	9827	130	96	225	89	39950	600	90	3249	3000	5485	11219	2613
Degrees														
Undergraduate														
B.A./B.S. Interdisciplinary Studies - Administration of Justice						X								
B.A./B.S. Interdisciplinary Studies - Criminal Justice													X	
B.A./B.S. Interdisciplinary Studies - Public Management (90/30)	X						X	X		X	X	X	X	X
B.A.S. Administration of Justice						X								
B.A.S. Emergency Services Administration						X	X							
B.A.S. Justice Systems Policy and Planning												X		
B.B.A. Business Administration								X				X	X	
B.S. Ed. Career and Technical Education - Occupational Education							X							
B.S. Ed. Elementary Education	X		X		X	X		X		X	X	X		X
B.S. Ed. Special and Elementary Education													X	
B.S. Hotel & Restaurant Management										X			X	
B.S. Interior Design										X				
B.S. Parks and Recreation Management										X				
B.S. Speech Communication					X									
B.S.N. Nursing													X	
Graduate														
Bilingual Education Endorsement		X												X
Ed.D. Educational Leadership		X										X		
English as a Second Language Endorsement		X					X							X
M. Administration - Leadership		X					X			X			X	X
M.A. Counseling							X							
M.A. English - General English Emphasis		X					X							
M.Ed. Bilingual/Multicultural Education		X					X							X
M.Ed. Counseling/School Counseling							X					X	X	
M.Ed. Early Childhood Education		X								X		X	X	X
M.Ed. Educational Leadership		X					X			X		X	X	X
M.Ed. Elementary Education with Certification Emphasis		X					X					X		
M.Ed. Elementary Education-Continuing Professional Emphasis		X					X			X		X	X	X
M.Ed. Human Relations		X					X			X		X	X	X
M.Ed. in Secondary Education-Continuing Professional Emphasis		X					X			X				X
M.Ed. Secondary Education with Certification Emphasis							X							
M.Ed. Special Education: Cross-Categorical (noncertified)		X												
Non Degree - Personal Enrichment (Graduate)	X	X	X	X	X	X	X		X	X	X	X	X	X
Post-Professional Doctor of Physical Therapy							X							
Principal Certificate		X					X			X		X	X	X
Reading Endorsement		X					X			X		X	X	X
Superintendent Certificate		X					X					X	X	X

[1] One faculty member shared with Pima CC Northwest campus; Nursing facilities moved from Tucson Medical Center facility in November 2008 when renovation completed at the North Tucson location

NARRATIVE

- In the third year of an agreement signed between the Maricopa Community Colleges and Northern Arizona University, the partnership, named the NAU-Maricopa Connection, has flourished. NAU and Maricopa have jointly established a Connection website (www.maricopa.edu/connection). Through the site, students can easily identify programs, locations, advisors and scholarship information in one central location.

  NAU has established offices on each of the Maricopa campuses. The partnership has opened the door to a stronger NAU presence throughout the county, which means that Maricopa students have greater access to a variety of quality, comprehensive, affordable academic programs. The partnership provides 22 on-site bachelor's completion programs on Maricopa campuses, along with a wide variety of baccalaureate and certificate programs available online.

- During the past year NAU gained greater visibility on the Scottsdale Community College campus by locating in a newly remodeled facility with dedicated classroom space for NAU programs. The enhanced facility provides space for full time faculty members in Hotel & Restaurant Management, Interior Design, and Early Childhood Education programs. These programs have all grown substantially this year.

  NAU also increased space on the Chandler-Gilbert Community College campus, providing facilities for a full time faculty member and additional staff to provide student support for growing programs on the campus.

- Growth in the Bachelor of Business Administration (BBA) program was significant. Faculty at the NAU Yuma Branch Campus recognized the need of the state ,and particularly rural areas, for business education. They have moved toward delivering the entire program in an online format, which will be available to students across the state in academic year 2009-2010. Advisors and coordinators supported by expansion funds assist with recruiting and advising for the program, which is currently serving 175 students.

FINANCIAL INFORMATION

	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Rev Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE								
Carry Forward	$0	$0	$1,149,999	$1,769,193	$604,121	$604,121	$481,904	$0
New TRIF Revenue	$0	$1,149,999	$1,010,206	$1,054,796	$818,043	$826,263	$773,875	$772,474
TOTAL REVENUE	$0	$1,149,999	$2,160,205	$2,823,989	$1,422,164	$1,430,384	$1,255,779	$772,474
OPERATING BUDGET								
Personal Services	$0	$0	$0	$255,265	$338,883	$0	$428,000	$230,000
Operating	$0	$0	$391,012	$1,964,603	$1,083,281	$948,480	$827,779	$542,474
TOTAL EXPENDITURES	$0	$0	$391,012	$2,219,868	$1,422,164	$948,480	$1,255,779	$772,474

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.

* Note: FY 2009 revenue/expense reported prior to official fiscal year close.

SUPPORT OF ABOR'S STRATEGIC GOALS

Quality

NAU has made significant progress toward enhancing the quality of education delivered off the Flagstaff Campus. Expansion of facilities, partnerships, and degrees set the stage for considerable advancement. Through the enhanced facilities, both freestanding and on community college campuses, NAU has demonstrated its commitment to expand access to quality programs led by full time faculty and supported by cutting edge technology. In March 2009, Northern Arizona University announced a plan to phase out the existing network of video conference classrooms and supporting infrastructure. Delivery of programs will be transitioned to web based technologies beginning Fall 2009. The new technology is one that leaders in higher education are using to conduct business and deliver courses. NAU is committed to remaining competitive and at the cutting-edge of education via reliable, user-friendly technology that is student centered.

Affordable Education Through Partnerships

By strengthening our partnerships with Arizona community colleges, NAU has succeeded in increasing student access to four year degrees. The partnerships also enhance continued development of new programs that articulate with associates degrees. A new Bachelor of Interdisciplinary Studies allows for the transfer of up to 90 units of coursework from the local community college. Students can then earn a bachelor's degree by completing only 30 units at NAU. This is the most affordable four year degree option in the state of Arizona. Student interest in NAU programs has increased markedly in the last year with 11 percent growth in new undergraduate students. These outcomes are evidence of NAU's ability to advance ABOR's goals of providing affordable university education for Arizona students.

Workforce Development

Northern Arizona University remains focused on the workforce needs in the state by advancing the accessibility to degrees in health care, business, and education. Degrees in physical therapy and dental hygiene are currently being offered to increase the number of highly skilled medical technicians in Arizona. Seventy-three percent of students in NAU's Extended Campuses work more than 32 hours per week. Flexible delivery methods allow these students to complete university classes regardless of their work schedule. Twelve new on-line offerings were made available during the past year, providing even more opportunities for students to earn

NORTHERN ARIZONA UNIVERSITY

LEARN MORE

Contact Fred Hurst, Vice President, Extended Campuses; Dean of Online Learning , at Fred.Hurst@nau.edu, or call 928-523-6598. Or Visit the Extended Campuses website at http://extended.nau.edu/

NAU-YUMA Expansion

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

ABOR TRIF Strategic Initiatives Award: $2,000,000

Introduction

The university is able to meet the most pressing educational needs of most Arizona's rural areas thanks to the university's flexibility in strategically managing limited resources. However, the population growth of the urban areas is far outpacing the university's capacity to serve Maricopa, Pima, and Yuma Counties adequately. While Arizona's citizens of Maricopa and Pima Counties have multiple choices to earn baccalaureate or higher degrees—from both private and public institutions, for the population of Yuma County (and neighboring areas), NAU remains the only option to access a baccalaureate-degree-granting institution locally.

Mission: To meet the educational needs of the lower Colorado River region by fostering scholarly, intellectual, and cultural activities in collaboration with the local community colleges and business and governmental entities.

According to the 2006 Educational Needs Report published by the Lumina Foundation, Yuma County has the 26th highest education need among 3,040 counties nationwide—a clear indication that a four-year education is crucial for Yuma's competency to sustain healthy economic growth.

To provide the community with the opportunities that will ensure prosperity of the region, Yuma Branch Campus will invest in baccalaureate programs that meet current market demands and provide the necessary human capital to diversify the economy. The programs include public administration, business, and engineering.

The applied research center, already under construction, will complement the science classroom instruction and provide the necessary laboratory equipment and space to foster undergraduate research. In addition, it will serve as a base for visiting faculty from the Flagstaff campus involved in applied research in relevant to the Lower Colorado region.

To improve student success, the branch campus will invest, jointly with Arizona Western College, in a Writing Center—a much needed student support service that will improve student persistence and graduation. The Writing Center, as envisioned, will serve the students through their entire academic career, as they are moving from the community college to the university.

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Project's most relevant ABOR issues:

- Increase Student Participation in University Education
- Enhance the quality of Student Education
- Increase Affordable Education for Students
- Provide an Educated, Competitive Workforce
- Optimize University Resource

MARKET CONDITIONS

Degree Opportunities

The Yuma Branch Campus is currently the only option for college-bound students of all ages to pursue locally-delivered baccalaureate degrees.. For the last 21 years NAU has been committed to meet the needs of the Yuma region by providing high-quality programs and student services by leveraging the partnership with AWC.

Other options available to local residents are NAU online programs as well as online and hybrid programs of other public and private institutions.

Demographics

The Yuma-El Centro designated market area has a population of more than 363,000 and is expected to grow by almost 15 percent by 2012.

It is pre-dominantly a Hispanic community with the population of Hispanic origin comprising 66 percent—a proportion that is expected to grow to 69 percent by 2012.

Approximately 26 percent of the population in Yuma County is either non-US citizen or naturalized, compared with 15 percent in Arizona.

With six percent, Yuma's proportion of adult population enrollment in college or graduate school is significantly below the national norm of nine and Arizona's 8.8 percent. Only 11 percent of Yuma's population (age 25+) has a bachelor's degree or higher, compared with 26 percent statewide and 27 percent nationwide.

The unique demographic composition of the region provides many opportunities and challenges that the Yuma Branch Campus has been addressing for more than 20 years.

Economic Base

Yuma-El Centro is an $18.5 billion market with the top industries by sales volume, including fresh fruit and vegetable merchant wholesalers, farm supplies merchant wholesalers, new car dealers, and supermarkets and other grocery stores. It is obvious that Yuma's economic base is heavily dependent on water-intensive agriculture, with a very few other industries: This lack of economic diversity may pose significant problems for the region should environmental conditions changed dramatically.

Baccalaureate education in business, engineering, computer and applied sciences will play a major role in diversifying local economy—the path to assuring the region's long-term prosperity.

FINANCIAL INFORMATION

	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Rev Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE								
Carry Forward	$0	$0	$0	$1,264,210	$1,500,000	$1,500,000	$954,090	$0
New TRIF Revenue	$0	$0	$0	$735,790	$0	$0	$0	$0
TOTAL REVENUE	$0	$0	$0	$2,000,000	$1,500,000	$1,500,000	$954,090	$0
OPERATING BUDGET								
Personal Services	$0	$0	$0	$0	$1,053,000	$538,114	$896,190	$0
Operating	$0	$0	$0	$0	$447,000	$7,797	$57,900	$0
Debt Svc	$0	$0	$0	$500,000	$0	$0	$0	$0
TOTAL EXPENDITURES	$0	$0	$0	$500,000	$1,500,000	$545,910	$954,090	$0

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.

STRATEGIC INITIATIVES

The Dr. James R. Carruthers Research and Education Building,

Originally called the "Applied Research Center is designed to foster regional economic development and provide students and faculty the opportunity for enhanced teaching and learning. As a shared facility with AWC it further promotes collaboration in physical sciences, specifically in biology and chemistry. Facility construction has been completed and the building is being equipped. The first positive result of this effort has been the awarding of a National Science Foundation S.T.E.M. Grant to the Yuma Branch Campus. The total award is $600,000 for five years and it supports tuition for science students, along with support of specialized advising and tutoring. The grantees worked closely with the local community to insure that the program supports the needs of the Yuma Region.

Academic Programs Expansion

- Business

The Bachelor of Business Administration was developed to provide graduates with the skills necessary to work effectively in large or small organizations, to start small businesses, or to continue with a graduate-level degree. Emphasis areas include global business, small business, and management, addressing issues such as ethics and social responsibility, environmental sustainability, and profitability. A program coordinator/faculty coordinator has been hired for this program. One faculty search is nearing completion, while another is getting underway. A technology management program has been added to the BBA portfolio along with a BAS/BAS in Administration. Both of the programs will begin in Fall, 2009. This is one of the fastest growing degree plans offered by the Yuma Branch Campus. Both the administrative and curricular structures are housed on the Branch campus, which delivers the program not only to the Yuma area, but also throughout Arizona as both an online and face-to-face program.

- Public Administration

Many of the current baccalaureate programs are built as liberal arts programs while the current market demand calls for more applied science degrees. To provide major local employers—national security, police protection, legislative bodies, and correctional institutions—with an access to qualified local workforce, the Bachelor of Applied Science in Public Agency Service will be offered in addition to the existing interdisciplinary studies.

The administrative and curricular structure of the Public Administration (Public Agency Management) has been moved to the Yuma Branch Campus. A search is underway for a faculty coordinator . With the move of the program to Yuma, enrollment has increased and there is a very strong interest in the program among both Border Patrol and local public sector agencies. Two new 90/30 emphases areas (Administration of Justice and Emergency Services Administration) are under development. This is another of the fast growing programs that have been added to the campus. Along with the BBA, this program now adds significantly to the educational opportunities for students interested in administration, supervision and management in both the public and private sectors.

- Other Programs

Yuma Branch Campus's current baccalaureate in-person programs are already focused on much needed social sciences. However, there is an emerging need to provide the community with access to natural and health sciences and computer technology education.

A number of programs, including computer technology management, engineering and a BSN in Nursing have been under consideration. The development of computer technology management program was first viewed as a stand-alone program. Review of other similar programs suggested that placing it under the administration of the BBA would cut down on the administrative costs, while providing a synergy between the two programs.

A BSN program has been established in conjunction with the Yuma Regional Medical Center. More detail on this program can be found under "Healthcare Program Expansion".

Work on an Engineering program has been postponed. While there remains moderate community interest in the development of such a program, there is little interest among students in the program at this time. Recent evaluation of the potential pipeline of students found that fewer than 10 students were interested in Engineering and almost no students actually prepared to enter an Engineering program in Yuma. This issue will be revisited after the new Mathematics facility is completed on the AWC campus. This will help reduce one of the major impediments to entry of students into engineering.

STRATEGIC INITIATIVES

Student support services including Writing Center

Forty five percent of the Yuma County population speaks Spanish at home, compared with 21 percent in Arizona and 12 percent nationwide. This presents both opportunities and challenges to NAU and AWC. While having a good command of Spanish is extremely useful, making business proceedings and social interactions in this bilingual environment easier, for many local students, growing up with English as a second language creates a potential barrier on the path toward educational success. Written and oral communication skills are essential learning outcomes students must master in order to succeed in both college studies and workplace: 73 percent of employers nationwide want colleges to place more emphasis on these soft skills.

Establishing a joint writing center—in partnership with AWC—is a crucial endeavor to support students from the very beginning of their academic career at AWC and as they progress through NAU programs. The continuity of the Center's services throughout the student's career, the familiar and nurturing staff, the high quality tutoring and coaching, are the key elements of the program. NAU's successful writing center on the Flagstaff campus will serve as a model.

An assessment of student needs was completed during AY2009 and a search is now underway to hire a writing center coordinator. Arizona Western College has also funded a full-time position in their writing center, which will be co-located with Yuma Branch Campus writing center. In further support of this effort both the Yuma Branch Campus and AWC are seeking Title V funding for expansion of the writing center.

B.A./B.S. in Interdisciplinary Studies

- Administration
- Administration of Justice
- Biology
- Criminology & Criminal Justice
- Emergency Services Administration
- Environmental Science
- Humanities (also 90/30 program)
- Psychology
- Public Agency Management (also 90/30 program)
- Sociology

Bachelor of Applied Science

- Administration
- Administration of Justice
- Early Childhood Education
- Emergency Services Administration
- Public Agency Management
- Social & Community Services
- Technology Management

Bachelor of Science

- Biology
- Criminology & Criminal Justice
- Environmental Science
- Psychology

Bachelor of Arts

- Psychology
- Spanish

Bachelor of Science in Education

- Elementary Education
- Secondary Education
  - Earth Science
  - Spanish

Bachelor of Business Administration

Bachelor of Social Work

Northern Arizona University has been serving the educational needs of rural Arizona for more than 25 years. With more than 35 campuses across the state—many established in partnership with community colleges—and implementation of NAU's signature *Expand on Demand* model, the university has been able to continuously improve the access of Arizona citizens to higher education.

NORTHERN ARIZONA UNIVERSITY

LEARN MORE

Contact Fred Hurst, Vice President, at fred.hurst@nau.edu, or 928-523-6598.

Healthy Forest

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

ABOR TRIF Strategic Initiative Award: $1.15M

During the last 120 years, southwestern ponderosa pine forests have radically changed. These ecosystem changes are a result of livestock grazing, high-grade logging, fire suppression, and some forms of recreation. Some of the specific changes include decreased wildlife diversity, increased densities of small stunted trees, increased threats of large-scale insect infestation of trees, change from frequent (every 2-8 years), low-intensity ground/grass fires (which serve to cycle nutrients and promote ecosystem health), to increasingly large catastrophic "crown" fires, and increasing threats to property and human lives. Scientists, environmentalists, public land-management agencies, and decision-makers agree that restoration of southwestern ponderosa pine forests is critical. Ecologically based restoration is the most effective approach we can take to reestablish the ecological integrity, or completeness, of the forest while protecting human communities. It is an approach that is informed by science and establishes as its primary goal the restoration of fully functional ecosystems that are linked to sustainable use by humans.

An ERI administrator, examines a large catface on a severely burnt ponderosa pine. Catfaces are triangle-shaped tree wounds caused by fires burning away the bark and cambium of a tree.

Ecological restoration is not a recipe for ecosystem management. Rather, it is a broad conceptual framework for helping ecosystems recover more nearly natural structure and function while providing for continued use by humans.

The Ecological Restoration Institute (ERI) at Northern Arizona University (NAU) is engaged in research, outreach and education in ecological restoration of western forests. The ERI works to help land management agencies

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Project's most relevant ABOR issues:

- Increase Student Participation in University Education
- Enhance the Quality of Student Education
- Increase Affordable Education for Students
- Provide an Educated, Competitive Workforce
- Optimize University Resource

INTRODUCTION (CONT'D)

and communities by providing comprehensive focused studies, monitoring and evaluating research, and technical support. The goals of ERI go beyond scientific discovery to the meaningful application of scientific knowledge that makes a difference for western forests. The ERI is nationally recognized as a leader in solving problems of degraded forest health and unnatural wildfire through science-based approaches, and continues to gain federal and state support for its projects. This funding has facilitated a wide array of research work by ERI staff, students, and partners. The ERI has also directly benefited southwestern communities by providing technical expertise to policy-makers, professional land managers, and community members seeking to restore ecological integrity and reduce fire risks in the region's forests.

Mission: To serve as an objective leader in research, scholarship, and education, and in collaborative efforts to plan and implement restoration treatments for frequent-fire forest and woodland landscapes of the Interior West.

An *ERI Ecology Research Team member, seeding an interspace in an area of pinyon-juniper.*

OPERATIONAL STRATEGIES AND GOALS

In June, 2007, the Forest Health Advisory Council and the Forest Health Oversight Council released "A Statewide Strategy for Restoring Arizona's Forests." In order for this statewide strategy to be successful, coordinated action is needed by federal agencies, communities, businesses, citizens and decisions makers. ERI will continue to play a leadership role in these initiatives.

In 2009, ERI's accomplishments included:

- Hosted the Southwest Ecological Restoration Institutes (SWERI) Biophysical Monitoring Workshop, in which the participants agreed upon an efficient, yet robust set of biophysical variables that can be used by practitioners to adaptively inform management practices and monitor the effectiveness of restoration/land treatments.

- Consulted with tribal natural resource managers and their federal counterparts to develop plans for providing assistance to develop fire management plans for all tribes in Arizona.

- Conducted a web-based survey to determine whether ERI publications and web site are meeting the needs of parties interested in the restoration of frequent-fire forests in Arizona and the Interior West. Survey results are being applied to refine ERI outreach efforts to better serve resource managers and forest stakeholders

- Completed a multi-year research/management project with the Kaibab National Forest designed to apply ecological information for reducing wildfire hazards in the vicinity of Grand Canyon Village and Tusayan, Arizona. ERI scientists tested practical alternatives for reducing fuels in pinyon-juniper ecosystems, the most widespread forest type in Arizona, while maintaining key elements including ancient trees and native plants.

The ERI is a nationally acclaimed program with a proven track record of working with others to restore forests, identify economic development opportunities and develop strategies for community protection. Financial support from the ABOR Innovation Fund has allowed NAU to provide scientific support and leadership to address these problems throughout Arizona.

Whether natural or man-made, fire has a significant impact on strategies for maintaining forest health.

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.

FINANCIALS

The state funding provided to the ERI in the past has enabled state resources to be leveraged with federal funding to make significant advancements towards restoring Arizona's forests. The Innovation Fund support will permit the ERI to increase the scope and extent of our outreach activities. NAU was awarded $1.15 million to allow ERI to expand its research, education and outreach activities so that the benefits of forest health are made available to the people, communities, and governments of Arizona. The funding will be allocated over three fiscal years beginning in fiscal year 2009.

The majority of the budget is dedicated to supporting the personnel required to carry out the research, education, and outreach activities articulated in this plan. The remaining budget supports the travel to communities and national forests, supplies and equipment necessary to complete the goals. This funding will leverage other state and federal funds to maximize leverage and value to all NAU-ERI customers (people, communities, and governments).

Budget Summary

	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Rev Budget	FY 2009 Actual	FY 2010 Rev Budget	FY 2011 Rev Budget
REVENUE								
Carry Forward	$0	$0	$0	$0	$0	$0	$95,187	$0
New TRIF Revenue	$0	$0	$0	$0	$271,441	$274,169	$293,469	$292,938
TOTAL REVENUE	$0	$0	$0	$0	$271,441	$274,169	$388,656	$292,938
OPERATING BUDGET								
Personal Services	$0	$0	$0	$0	$216,000	$160,935	$305,000	$280,000
Operating	$0	$0	$0	$0	$55,441	$18,047	$83,656	$12,938
TOTAL EXPENDITURES	$0	$0	$0	$0	$271,441	$178,982	$388,656	$292,938

The ERI was formally established by the Arizona Board of Regents in 1997 and by federal legislation in 2004. The ERI is funded by a combination of programmatic state and federal funding and through competitive grants programs.

NORTHERN ARIZONA UNIVERSITY

LEARN MORE

Contact W. Wallace Covington, director of NAU's Ecological Restoration Institute (ERI), at 928-523-7182.

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

UNIVERSITY INITIATIVES

NORTHERN ARIZONA UNIVERSITY

September 1, 2009

NORTHERN ARIZONA UNIVERSITY INITIATIVES

In today's economic climate, individuals, businesses and public entities must be prepared to respond to opportunities and challenges within a very short time frame. Northern Arizona University is prepared for the opportunities and challenges of this environment by setting aside funds for university initiatives and opportunities that may arise.

As with all NAU TRIF initiatives, these funds have been and will be directed to meet the goals of the TRIF legislation and state economic development priorities. Investments have been made within the general context of NAU's four major initiatives: access/workforce development, E-learning and environmental and biotechnological research, development, and education. University Initiatives also allowed the university to contribute to economic development in Northern Arizona through investment in the High Country Conference Center. The HCCC has booked approximately $2M in business since opening, with an estimated economic impact in Flagstaff of another $2M.

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Dr. John Haeger, President
Northern Arizona University

The Applied Research and Development Building was one of 15 buildings world-wide to receive a 2009 recognition award from the Royal Institute of British Architects.

PERFORMANCE ANALYSIS

The Interdisciplinary Health Policy Institute

The Keim Lab in the Applied Research and Development Building

Classrooms as part of the upcoming Health and Learning Center

PERFORMANCE ANALYSIS

New Lab Building — equipment enhanced

Photo credit Tom Alexander

FINANCIAL INFORMATION

	FY 2002 Actual	FY 2003 Actual	FY 2004 Actual	FY 2005 Actual	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY 2009 Budget	FY2009 Actual	FY 2010 Budget	FY 2011 Budget
REVENUE											
Carry Forward	$0	$206,744	$664,608	$1,674,629	$3,054,612	$5,159,771	$120,491	$2,591,491	$2,591,491	$2,932,523	$0
TRIF Revenue	$298,203	$590,810	$938,517	$2,552,961	$1,764,371	$690,001	$3,239,528	$2,805,521	$2,833,714	$2,654,048	$2,649,246
TOTAL REVENUE	$298,203	$797,554	$1,603,125	$4,227,590	$4,818,983	$5,849,772	$3,360,019	$5,397,012	$5,425,205	$5,586,571	$2,649,246
OPERATING BUDGET											
Personal Services	$36,174	$72,666	$62,927	$266,070	$340,462	$153,992	$219,028	$192,726	$428,828	$345,519	$364,523
Operating	$55,285	$60,280	$17,761	$188,050	-$681,250	$483,950	$90,491	$1,900,968	$559,930	$3,637,666	$684,238
Building Renovation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Debt Svc/Capital	$0	$0	$0	$0	$0	$3,091,339	$296,179	$3,303,318	$1,503,924	$1,603,386	$1,600,485
Conference Center	$0	$0	$0	$0	$0	$2,000,000	$162,830	$0	$0	$0	$0
TOTAL EXPENDITURES	$91,459	$132,946	$80,688	$454,120	-$340,788	$5,729,281	$768,528	$5,397,012	$2,492,682	$5,586,571	$2,649,246

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

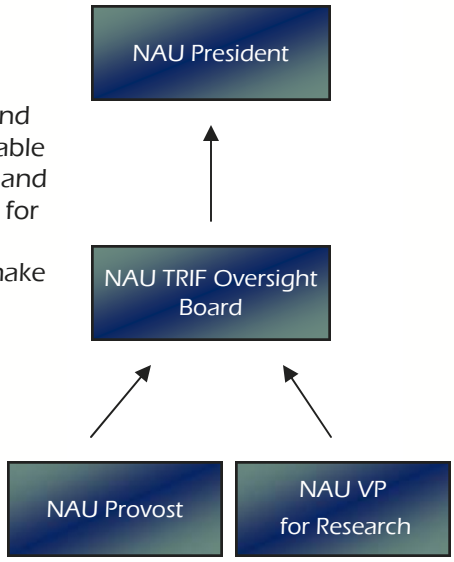
University Initiatives will provide coordinated oversight of all NAU TRIF Initiatives. This oversight will support our established programs, and ensure flexibility to respond to new demands. Our overall goal is to provide infrastructure that enables a coordinated and integrated approach to research,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

- Creation of an innovative, interdisciplinary Health Policy Institute to complement the university's investment in health care programming.
- Contributions to improvements in the Keim lab in the Applied Research and Development building which enabled the lab to extend its research capability beyond that in the original design.
- Equipment improvements in the Applied Research and Development and Laboratory Sciences buildings, helping to advance research and scientific education
- Continued support of TGen North and the Keim laboratory in advancing scientific research in Northern Arizona.

On the near horizon is a project to fund classroom space in the upcoming Health and Learning building. This investment will enable the facility to go beyond its original scope, and provide both added capacity and flexibility for university educational programs. We anticipate that health care programs will make significant use of these classrooms.

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.
Saundra 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. John Haeger, President at John.Haeger@nau.edu or (928) 523-3232

NORTHERN ARIZONA UNIVERSITY

THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 - 2011 BUDGETS

SUMMARY

	FY 2007 ACTUAL	*FY 2008 ACTUAL*	*FY 2009 REVISED BUDGET*	*FY 2009 ACTUAL*	*FY 2010 REVISED BUDGET*	*FY 2011 REVISED BUDGET*
REVENUE						
Carryforward	$ 6,812,073	$ 9,005,784	$ 5,854,007	$ 5,854,007	$ 1,072,941	$ -
TRIF Revenue	25,351,822	26,384,855	28,212,883	22,275,873	20,361,093	20,074,697
TOTAL REVENUE	**$ 32,163,895**	**$ 35,390,639**	**$ 34,066,890**	**$ 28,129,880**	**$ 21,434,034**	**$ 20,074,697**
EXPENDITURES						
OPERATING BUDGET						
Personal Services	$ 8,486,483	$ 11,666,431	$ 17,564,781	$ 11,209,729	$ 11,011,271	$ 10,369,364
ERE	2,606,677	3,476,967	5,430,220	3,499,028	3,315,047	3,224,824
All Other Operating	8,410,706	11,262,728	6,327,954	8,904,805	4,107,716	3,480,509
TOTAL OPERATING BUDGET	**19,503,866**	**26,406,126**	**29,322,955**	**23,613,562**	**18,434,034**	**17,074,697**
CAPITAL BUDGET						
Building Renovation	169,007	(285,963)	-	27	-	-
Debt Service	4,465,000	3,416,469	4,743,935	3,443,350	3,000,000	3,000,000
TOTAL CAPITAL BUDGET	**4,634,007**	**3,130,506**	**4,743,935**	**3,443,377**	**3,000,000**	**3,000,000**
EXPENDITURES GRAND TOTAL	**$ 24,137,873**	**$ 29,536,632**	**$ 34,066,890**	**$ 27,056,939**	**$ 21,434,034**	**$ 20,074,697**
SUMMARY BY INITIATIVE						
Bioresearch Program	$ 5,878,772	$ 9,000,889	$ 9,600,725	$ 7,610,195	$ 6,371,524	$ 5,925,637
Optical Sciences and Technology Program	3,187,607	3,340,957	4,328,463	3,642,702	2,584,031	2,656,045
Water and Environmental Sustainability Program	3,473,905	5,001,366	5,150,109	4,267,031	3,229,577	3,283,205
Higher Education in Rural Southern Arizona	-	-	810,594	315,800	618,111	-
Education and Infrastructure Program	8,160,936	9,100,061	10,429,549	8,776,787	7,388,638	7,062,094
Planning for Phoenix Biomedical Campus	211,146	447,332	91,522	91,522	-	-
Expansion of Phoenix Biomedical Campus	2,009,192	920,628	1,589,051	596,831	586,529	500,000
ASU-UA Joint Biomedical Research Fund	187,472	1,040,892	271,636	248,763	-	-
ASU-UA Solar Energy Initiative	-	224,876	1,525,124	1,388,172	595,624	611,272
Venture Fund	1,028,843	459,631	270,117	119,136	60,000	36,444
EXPENDITURES GRAND TOTAL	**$ 24,137,873**	**$ 29,536,632**	**$ 34,066,890**	**$ 27,056,939**	**$ 21,434,034**	**$ 20,074,697**

THE UNIVERSITY OF ARIZONA

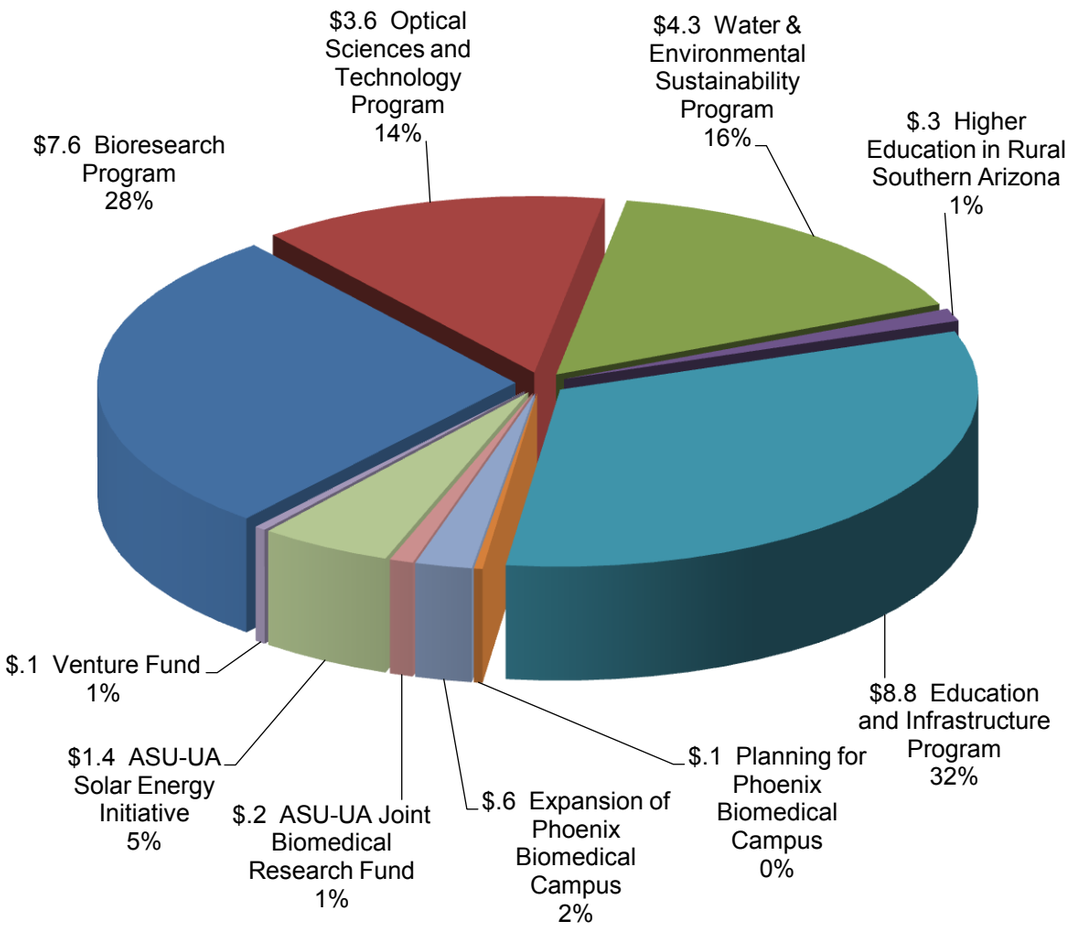
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 BUDGET / ACTUAL

SUMMARY BY PROGRAM AREA

	FY 2009 REVISED BUDGET	*FY 2009 ACTUAL*
REVENUE		
Carryforward	$ 5,854,007	$ 5,854,007
TRIF Revenue	28,212,883	22,275,873
TOTAL REVENUE	**$ 34,066,890**	**$ 28,129,880**
EXPENDITURES		
OPERATING BUDGET		
Personal Services	$ 17,564,781	$ 11,209,729
ERE	5,430,220	3,499,028
All Other Operating	6,327,954	8,904,805
TOTAL OPERATING BUDGET	**29,322,955**	**23,613,562**
CAPITAL BUDGET		
Building Renovation	-	27
Debt Service	4,743,935	3,443,350
TOTAL CAPITAL BUDGET	**4,743,935**	**3,443,377**
EXPENDITURES GRAND TOTAL	**$ 34,066,890**	**$ 27,056,939**
SUMMARY BY INITIATIVE		
Bioresearch Program	$ 9,600,725	$ 7,610,195
Optical Sciences and Technology Program	4,328,463	3,642,702
Water and Environmental Sustainability Program	5,150,109	4,267,031
Higher Education in Rural Southern Arizona	810,594	315,800
Education and Infrastructure Program	10,429,549	8,776,787
Planning for Phoenix Biomedical Campus	91,522	91,522
Expansion of Phoenix Biomedical Campus	1,589,051	596,831
ASU-UA Joint Biomedical Research Fund	271,636	248,763
ASU-UA Solar Energy Initiative	1,525,124	1,388,172
Venture Fund	270,117	119,136
EXPENDITURES GRAND TOTAL	**$ 34,066,890**	**$ 27,056,939**

FY 2009 UA ACTUAL TRIF EXPENDITURES
(in millions)



THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

TRIF PROGRAM

THE UNIVERSITY OF ARIZONA.
Arizona's First University.

September 1, 2009

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 Proposition 301 by Arizona voters in 2000. The TRIF portion of the proceeds from a six-tenths of a cent increase in state sales tax are administered by the Arizona Board of Regents and given to the state's public universities. 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. Funds also support specialized research facilities, enhancement of technology transfer, and distance-learning activities.

Research-intensive TRIF activities fall under Programs that capitalize on broad research and teaching strengths that meet important community needs:

- **Bioresearch**, which includes the BIO5 Institute for bioscience and biotechnology, the McKnight Brain Institute, and the Arizona Clinical and Translational Research and Educational Consortium;
- **Optical Sciences and Technology**, which has especially strong ties with industry; and
- **Water and Environmental Sustainability**, which includes Water Sustainability and Translational Environmental Research initiatives.

Two additional programs are funded by ABOR's TRIF Strategic Investments fund. The **UA-ASU Solar Energy Initiative**, collaborative with Arizona State University, provides funds for new research, develops existing knowledge for industrial enterprise, and develops educational and outreach programs related to solar energy. **Higher Education in Rural Southern Arizona** delivers training and border commerce programs in Arizona's border countries in a hybrid of on-site and distance education. Our final Program, in **Education and Infrastructure**, includes the Educator Development Plan, distance education through Anyplace Access for Arizonans, and on-line degree and certificate programs of the College of Nursing. Cross-cutting, foundational support for many activities is provided through Critical Core Infrastructure and Technology Transfer Infrastructure.

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Meredith Hay, Ph.D.
Executive Vice President and Provost

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

PERFORMANCE MEASURES

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT (IN MILLIONS)													
Sponsored Awards	$ 14.78	$ 22.92	$ 50.19	$ 39.92	$ 46.79	$ 60.01	$ 72.59	$ 64.84	$ 96.35	$ 71.16	$ 129.96	$ 77.31	$ 83.21
Gifts & Other Sources	$ 1.17	$ 5.11	$ 2.58	$ 0.55	$ 1.15	$ 2.00	$ 2.28	$ 2.26	$ 7.29	$ 2.96	$ 7.55	$ 3.45	$ 4.05
Patent Royalty Income	$ 0.71	$ 1.08	$ 1.01	$ 1.18	$ 1.69	$ 1.58	$ 1.27	$ 1.73	$ 0.79	$ 1.89	$ 0.77	$ 2.04	$ 2.19
TECHNOLOGY TRANSFER & COLLABORATIONS													
Invention Disclosures	109	168	141	167	118	182	161	165	152	174	190	202	218
Licenses & Options	18	99	42	57	33	42	35	44	45	46	55	49	55
Patent Applications	78	129	164	177	173	115	145	125	189	134	177	155	164
New Start-up Companies	12	2	7	9	8	15	4	6	6	8	14	8	13
Economic Impact Studies	0	0	1	1	0	1	2	1	0	1	0	1	1
WORKFORCE CONTRIBUTIONS													
Number of Graduate Students Enrolled		1183	1318	1378	1429	326	219	400	276	344	442	369	406
Number of Undergraduates Enrolled								20	20	56	71	66	76
Growth in Graduate Enrollment	35	20	26	4	29	3	15	4	(4)	3	22	4	4
Number of Graduate Degrees Awarded		266	280	285	420	58	29	40	56	45	56	53	61
New Graduates from ACIST related programs	0	69	256	224	100								
Growth in Optics-Related Undergraduate Enrolment	12	25	44	25	(12)	4	(40)	6	(5)	4	(3)	4	4
Number of Undergraduate Degrees Awarded	0	658	705	733	1014	0	0	0	0	0	0	20	30
Growth in Optics-Related Distance Learning Enrollment	3	48	32	32	23	5	(8)	8	(34)	8	(11)	2	2
Undergraduate Trainees	0	9	22	40	313	284	390	290	412	296	429	314	317
Graduate Trainees	1	16	54	75	379	339	368	361	478	375	424	352	377
Postdoctoral Trainees	2	2	3	3	140	158	156	154	167	159	163	160	169
ACIST graduates benefitting from minors in related areas	25	50	100	77	75								
Undergraduates taking non-technical minor	50	100	150	111	75								
Teachers Certified in Undergraduate Level Math & Science	7	12	22	20	24	40	24	40	25	30	27	30	30
Teachers Certified in Master's Level Math & Science	28	25	26	40	24	30	24	30	14	25	14	25	25
Teachers Certified in Agriculture	8	13	16	16	12	15	11	17	13	19	17	20	20
Total Student Credit Hours Produced								0	0	300	107	300	300
Number of Certificates Granted					9	50	0	58	85	99	12	125	158
Number of New Certificates Offered								0	0	2	1	2	2
Clinical Scholars Circle Members						40	44	50	52	80	90	120	150
Number of Affiliate Clinical Partners in ACTREC						9	3	14	32	21	25	34	47
New Faculty Hires	11	16	9	13	13	16	22	9	12	12	15	9	10
CURRICULUM INNOVATIONS & STUDENTS SERVED													
Number of Newly Revised Courses Offered				8	10	15	49	9	15	33	42	116	323
Number of Online Courses Offered	0	10	19	28	28	37	16	10	20	25	79	23	28
Curriculum Innovations program implemented	P1	39	40	6	2								
OUTREACH & EDUCATION													
Teachers/Educators Trained	0	524	880	1,032	1,217	1,063	1,419	1,179	1,470	1,220	2,519	1,253	1,294
K-12 Students Benefitting & Participating	2,150	29,390	32,730	38,545	77,352	42,925	84,474	69,200	74,727	75,000	79,090	80,850	85,900
Workshops, Seminars, & Conferences Supported	11	9	11	11	29	22	38	24	73	34	71	30	40
Users of Extension & Workplace Resources	0	493	58,000	103,000	156,055	200,000	31,415	250,000	225,503	300,000	5,470,117	350,000	400,000
Communities Assisted						5	7	10	9	10	12	10	10
Enrollments in Web & Hybrid Courses	0	20,450	24,528	35,353	77,557	39,373	104,715	41,085	2,154	2,434	4,793	2,734	3,024
DATA AND RESEARCH ACCESS & NETWORK													
Building Networks Brought to Standards						1	1	1	1	1	1	1	1
Supercomputer Usage						85-90%	90%	85-90%	78%	85-90%	94%	85-90%	85-90%
Percentile-ranked access to advanced networks						75th or better	75th	75th or better	50th	75th or better	50th	75th or better	75th or better

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
UA CONSOLIDATED TRIF FINANCIAL SCHEDULE											
Bioresearch Program											
Revenue	4,837,623	7,565,242	5,617,329	8,741,603	8,332,381	9,231,367	10,606,580	9,600,725	7,966,808	6,371,524	5,925,637
Expenditures	2,075,899	7,199,779	3,852,669	6,220,377	7,645,577	5,878,772	9,000,889	9,600,725	7,610,195	6,371,524	5,925,637
Return on Investment	0.7:1	2.2:1	6.6:1	4.3:1	3.5:1	6.4:1	5.2:1	4.1:1	9.0:1	5.6:1	6.2:1
Optical Sciences and Technology Program											
Revenue	4,395,646	6,339,470	4,846,348	4,858,145	5,277,994	3,782,078	4,193,386	4,328,463	3,570,688	2,584,031	2,656,045
Expenditures	2,859,694	6,014,645	4,480,050	3,627,920	5,142,408	3,187,607	3,340,957	4,328,463	3,642,702	2,584,031	2,656,045
Return on Investment	4.0:1	0.6:1	4.5:1	0.7:1	1.9:1	6.8:1	9.4:1	3.9:1	10.1:1	9.8:1	9.7:1
Water and Environmental Sustainability Program											
Revenue	474,283	922,432	2,104,886	2,898,746	4,503,450	5,335,450	5,854,659	5,150,109	4,213,403	3,229,577	3,283,205
Expenditures	32,203	827,112	1,667,088	2,302,796	3,813,467	3,473,905	5,001,366	5,150,109	4,267,031	3,229,577	3,283,205
Return on Investment	-	2.2:1	1.2:1	1.5:1	0.9:1	3.0:1	3.8:1	2.3:1	5.6:1	4.0:1	4.2:1
Education and Infrastrucuture Program											
Revenue	2,233,439	3,468,894	3,076,975	3,170,342	3,549,332	8,718,378	9,721,719	10,429,549	9,066,371	7,388,638	7,062,094
Expenditures	1,070,234	2,903,876	2,523,545	2,706,933	3,151,044	8,160,936	9,100,061	10,429,549	8,776,787	7,388,638	7,062,094
Venture Fund											
Revenue	-	-	-	68,123	68,123	1,201,622	603,234	270,117	173,556	60,000	36,444
Expenditures	-	-	-	-	68,123	1,028,843	459,631	270,117	119,136	60,000	36,444
ASU-UA Joint Biomedical Research Fund											
Revenue	-	-	-	-	-	1,000,000	1,052,528	271,636	248,763	-	-
Expenditures	-	-	-	-	-	187,472	1,040,892	271,636	248,763	-	-
Planning for Phoenix Biomedical Campus											
Revenue	-	-	-	-	-	750,000	538,854	91,522	91,522	-	-
Expenditures	-	-	-	-	-	211,146	447,332	91,522	91,522	-	-
Expansion of Phoenix Biomedical Campus											
Revenue	-	-	-	-	-	2,145,000	1,269,679	1,589,051	683,360	586,529	500,000
Expenditures	-	-	-	-	-	2,009,192	920,628	1,589,051	596,831	586,529	500,000
ASU-UA Solar Energy Initiative											
Revenue	-	-	-	-	-	-	1,050,000	1,525,124	1,372,524	595,624	611,272
Expenditures	-	-	-	-	-	-	224,876	1,525,124	1,388,172	595,624	611,272
Return on Investment							9.9:1	1.3:1	2.3:1	4.7:1	11.1:1
Higher Education in Rural Southern Arizona											
Revenue	-	-	-	-	-	-	500,000	810,594	742,885	618,111	-
Expenditures	-	-	-	-	-	-	-	810,594	315,800	618,111	-
ACIST											
Revenue	3,864,703	5,813,439	5,747,018	5,271,272	4,307,688	-	-	-	-	-	-
Expenditures	2,182,290	4,286,510	4,859,477	4,350,084	3,876,167	-	-	-	-	-	-
Return on Investment	0.5:1	1.2:1	0.7:1	0.9:1	0.5:1	-	-	-	-	-	-

MANAGEMENT AND ADVISORY BOARDS

Management: *All University of Arizona TRIF activities report to* **Dr. Meredith Hay,** *Executive Vice President and Provost and* **Dr. Leslie P. Tolbert,** *Vice President for Research, Graduate Studies, and Economic Development. The Directors of the University's TRIF Programs and the individual Initiatives that fall under them are listed below:*

BIORESEARCH PROGRAM LEADER: Dr. Vicki Chandler, *Director, The BIO5 Institute and Regents' Professor and Carl E. and Patricia Weiler Endowed Chair*

ACTREC: Dr. Peter Lance , *Professor, Medicine*

BIO5: Dr. Fernando Martinez, *Director, BIO5 institute*

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

EDUCATION AND INFRASTRUCTURE PROGRAM LEADER: Dr. Ronald Marx, *Dean, College of Education*

Anyplace Access for Arizonans: Mr. Mike Proctor, *Senior Associate Vice President for University Outreach and International Programs*

Critical Core Infrastructure: Ms. Michele Norin, *CIO and Executive Director, University Information Technology Services*

Nursing Online Programs: Dr. Carolyn Murdaugh, *Interim Dean and Professor, College of Nursing*

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

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

HIGHER EDUCATION IN RURAL SOUTHERN ARIZONA: Mr. Michael Proctor, *Vice President for Outreach and International Programs*

OPTICAL SCIENCES AND TECHNOLOGY PROGRAM: Dr. James C. Wyant, *Dean and Professor, College of Optical Sciences*

WATER AND ENVIRONMENTAL SUSTAINABILITY PROGRAM:

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

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

ASU-UA JOINT BIOMEDICAL RESEARCH FUND: Dr. Leslie P. Tolbert, *Vice President for Research, Graduate Studies, and Economic Development*

UA-ASU SOLAR ENERGY INITIATIVE: Dr. Joseph Simmons, *Department Head and Professor, Materials Science and Engineering*

EXPANSION OF PHOENIX BIOMEDICAL CAMPUS: Mr. Joel Valdez, *Senior Vice President, Business Affairs*

PLANNING FOR PHOENIX BIOMEDICAL CAMPUS: Mr. Joel Valdez, *Senior Vice President, Business Affairs*

VENTURE FUND: Dr. Meredith Hay, *Executive Vice President and Provost, and* **Dr. Leslie P. Tolbert,** *Vice President for Research, Graduate Studies, and Economic Development*

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. The four TRIF Programs have Advisory Boards that comprise select members from the Boards of the individual initiatives. within the Programs. For additional information, please refer to page 4 of the brochures for the individual TRIF Programs.*

LEARN MORE

- Contact Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies, and Economic Development, at tolbert@email.arizona.edu or 520-621-3513.

THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

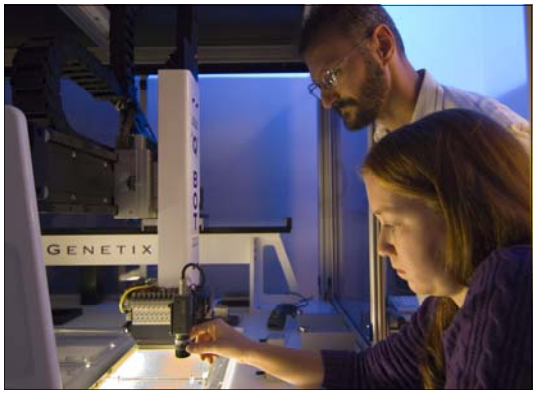
BIORESEARCH PROGRAM

THE UNIVERSITY OF ARIZONA
Arizona's First University

September 1, 2009

TRIF UA Bioresearch Program faculty, students, and staff tackle complex and pressing problems of critical importance to Arizona and the nation. They do so by conducting leading edge interdisciplinary research and training initiatives, and putting in place crucial technology platforms and clinical trials infrastructure.

UA's TRIF-supported scientists are developing new ways to diagnose, treat and prevent disease; uncovering the biological basis of cognition and developing methods to reduce the negative impact of aging; and improving agriculture to better feed the world while maintaining livable environments. Through its research programs in bioengineering, drug discovery, genome structure and function, quantitative biology, and the neural basis for memory changes, scientists address cancer, diabetes, heart, neurological and respiratory diseases, cognition and aging. They develop new diagnostic tools; improve yield and nutritional quality of crops; and develop plants as sources of pharmaceuticals.



The UA Bioresearch Program is building the infrastructure to transfer research breakthroughs into applications that directly benefit society. A key aspect is the training of a new generation of clinical and translational scientists, who are bridging the gap between basic and clinical sciences and who will transform research discoveries into new medicines to treat patients and preserve health. This requires the creation of statewide structures for clinical and translational research, application of biomedical informatics and enabling technologies, and financial support of teams of clinical and translational investigators. A second key aspect is moving discoveries to market through innovative programs and multiple partnerships with the private sector. A third key aspect is improving science education in K-12 and training the next generation of interdisciplinary scientists.

Fernando Martinez has overall responsibility for the TRIF UA Bioresearch Program, which supports three initiatives: the BIO5 Institute (directed by Fernando Martinez), the McKnight Brain Institute (directed by Carol Barnes) and ACTREC (Arizona Clinical and Translational Research and Education Consortium, directed by M. Peter Lance). Measures and goals are combined for all three initiatives.

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Fernando D. Martinez, MD
Interim Director, BIO5 Institute
Regents' Professor

PERFORMANCE MEASURES

	FY 02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY 08 Proj	FY 08 Actual	FY 09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT													
Sponsored Awards: ($ in millions)	$1.4	$15.7	$25.3	$26.5	$26.9	$29.9	$36.3	$ 30.1	$ 45.9	$ 38.1	$ 66.7	$ 34.6	$ 35.3
Federal Awards	$1.4	$15.6	$25.1	$26.2	$26.5	$28.9	$35.3	$ 27.1	$ 37.8	$ 33.1	$ 59.9	$ 31.6	$ 31.8
Industrial Awards		$ 0.1	$ 0.2	$ 0.3	$ 0.4	$ 1.0	$ 1.0	$ 1.5	$ 0.6	$ 2.5	$ 0.6	$ 1.0	$ 1.5
Other Awards								$ 1.5	$ 7.5	$ 2.5	$ 6.2	$ 2.0	$ 2.0
Gifts & Other Sources					$0.2	$1.1	$1.4	$ 1.2	$ 1.3	$ 1.3	$ 1.6	$ 1.4	$ 1.5
TECHNOLOGY TRANSFER & COLLABORATIONS													
Invention Disclosures[1]		57	46	65	30	22	30	24	23	27	26	28	28
Licenses & Options[1]		75	17	25	7	4	4	5	4	6	11	7	8
Patent Applications	1	37	63	50	37								
New Start-up Companies					1	1	1	0	0	2	3	0	2
WORKFORCE CONTRIBUTIONS													
Number of Graduate Students Enrolled		1,183	1,299	1,341	1,268								
Number of Undergraduate Degrees Awarded		658	705	733	1,014								
Number of Graduate Degrees Awarded		266	280	285	420								
Undergraduate Trainees					273	242	338	247	348	253	355	258	261
Graduate Trainees					290	254	300	266	380	280	347	293	318
Postdoctoral Trainees					137	154	148	146	161	150	156	151	158
New Faculty Hires	7	8	8	6	6	5	10	5	8	8	8	5	6
Clinical Scholars Circle Members						40	44	50	52	80	90	120	150
Number of Affiliate Clinical Partners in ACTREC						9	3	14	32	21	25	34	47
OUTREACH & EDUCATION													
Teachers/Educators Trained					220	113	289	200	730	200	750	200	200
K-12 Students Benefitting & Participating					35,082	9,175	45,342	30,000	40,007	30,000	42,036	30,000	30,000
Workshops, Seminars, & Conferences Supported	3	3	3	3	10	11	12	11	47	19	46	9	19

[1]FY03 to FY06 activities include all UA Life Sciences; FY03 to FY09 and projections are Bioresearch activities only.

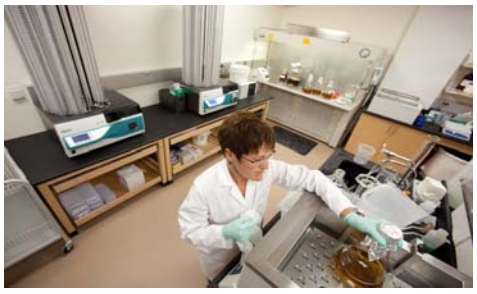
[2]Sponsored awards in FY09 reflect the multi-year federal award of the National Children's Study (~$16M)

PERFORMANCE ANALYSIS

The Bioresearch Program funds are significantly leveraged to improve Arizonans' lives through conducting leading edge basic and applied research and training programs, moving discoveries to market and increasing the number of businesses in Arizona, preparing students for careers in science, technology and medicine, and improving K-12 science education.

RETURN ON INVESTMENT (ROI)

Achievements of faculty members who are or have been directly supported by TRIF are reported. Bioresearch Program faculty continue to be nationally competitive in garnering federal research dollars, in spite of very tight federal budgets. For example, outstanding faculty and the BIO5 Institute's infrastructure led to a $50 million NSF grant, (~$15M received to date), to establish the iPlant Collaborative. The $1 million match each year from McKnight Brain Research Foundation provides a firm base for the McKnight Brain Institute, and ACTREC continues to support both the CATS Research Center, which has grown from 11 to 50 research protocols, and the Health Research Alliance Arizona (HRAA), a collaboration among UA, ASU and NAU.



TECHNOLOGY TRANSFER AND INDUSTRY COLLABORATION

The commercialization of new products and processes and the expansion of the biotechnology industry is facilitated through interactions and collaborations among faculty, students, and industrial scientists and making our leading-edge facilities available to industry scientists. Researchers continue to generate substantial invention disclosures and licenses & options in the life sciences arena. This year, three new biotechnology companies based on UA faculty research have received ABOR approval. They are: BioVidria

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE											
Carry Forward	$ -	$ 2,761,724	$ 365,463	$1,764,660	$ 2,521,226	$ 2,586,804	$ 3,352,595	$ 1,605,691	$ 1,605,691	$ 356,613	$ -
New TRIF Revenue	$ 4,837,623	$ 4,803,518	$ 5,251,866	$6,976,943	$ 5,811,155	$ 6,644,563	$ 6,753,985	$ 7,495,034	$ 5,861,117	$ 6,014,911	$5,925,637
Regents Innovation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ 500,000	$ 500,000	$ 500,000	$ -	$ -
TOTAL REVENUE	**$ 4,837,623**	**$ 7,565,242**	**$ 5,617,329**	**$8,741,603**	**$8,332,381**	**$ 9,231,367**	**$10,606,580**	**$ 9,600,725**	**$ 7,966,808**	**$ 6,371,524**	**$5,925,637**
EXPENDITURES											
Personal Services	$ 620,100	$ 3,325,935	$ 308,333	$2,594,735	$3,604,324	$ 3,350,614	$ 6,199,528	$ 7,834,755	$ 5,836,438	$ 5,135,569	$5,046,548
All Other Operating Expenses	$ 1,195,799	$ 3,713,844	$ 1,544,336	$1,475,642	$2,353,434	$ 2,359,151	$ 3,107,163	$ 1,265,970	$ 1,150,634	$ 1,235,955	$ 879,089
Capital	$ 260,000	$ 160,000	$ 2,000,000	$2,150,000	$1,687,819	$ 169,007	$ (316,028)	$ -	$ 5,120	$ -	$ -
Regents Innovation Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,226	$ 500,000	$ 618,003	$ -	$ -
TOTAL EXPENDITURES	**$ 2,075,899**	**$ 7,199,779**	**$ 3,852,669**	**$6,220,377**	**$7,645,577**	**$ 5,878,772**	**$ 9,000,889**	**$ 9,600,725**	**$ 7,610,195**	**$6,371,524**	**$5,925,637**
Return on Investment	0.7:1	2.2:1	6.6:1	4.3:1	3.5:1	6.4:1	5.2:1	4.1:1	9.0:1	5.6 :1	6.2:1

Notes:
1)Carry forward for FY07 consists of the following: Carry forward of $686,804 from BIO5 Institute; Over-realized revenue of $900,000 from McKnight Brain Institute; and Over-realized revenue of $1,000,000 from Arizona Clinical and Translational Research.
2) TRIF Regents Innovation Fund for the HRAA CTSA statewide effort approved at the December 6—7, 2007 ABOR meeting.
3) 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.
4) 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.

started by Mary Wirth to speed drug discovery and disease detection through coated microarrays; Luceome Biotechnologies owned and run by Indraneel Ghosh using Kinase Seeker, a technology to speed the development of drugs to treat cancers and other diseases; and Cancer Prevention Pharmaceuticals, run by Eugene Gerner, that is currently conducting clinical trials on a drug combination that substantially reduces the recurrence of colon cancer. All three faculty are BIO5 members.

Workforce Contributions

A critical component of economic development is a workforce to meet the needs of Arizona's growing bioscience and health industries. 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. Our internships expose students to industry settings and community college, high school students and teachers to cutting-edge research at the university. New graduate programs are training the next generation of interdisciplinary researchers. The translational scholars program and clinical scholar's circle, bringing together basic research faculty mentors and clinical scholars, have been established.

K-12 Science and Math Education

To enhance K-12 science and math education, we provide teachers and students in schools all over Arizona access to UA science and math resources and opportunities to participate in hands-on research experiences. We lead workshops and symposia for teachers and provide in-classroom support to assist them in implementing new, exciting curricula that meet state standards. Our programs are externally reviewed and receive significant federal funding, reported under ROI.

Educational Outreach

National and international scientific meetings have been organized to bring together top investigators in the world. For example, in May 2009, BIO5 hosted RECOMB2009, the 13th International Conference on Computation Biology. UA investigators organized the first McKnight Social Event at the Society for Neuroscience Annual Meeting in Washington, DC to bring together neuroscientists from around the country who are interested in aging research. In March 2009, HRAA held its first annual conference on Advances in Translational Science, providing state-of-the-art information for both established researchers and those in training.

GOALS

- Conduct state-of-the-art interdisciplinary bioresearch and translate it into tangible human benefit.
- Foster collaborative research between UA faculty and researchers within other Arizona institutions.
- Develop leading-edge interdisciplinary education and training programs for undergraduate and graduate students.
- Promote a translational scholars program and a clinical scholar's circle, which brings together cross-disciplinary senior faculty mentors and clinician scholars in research collaborations.
- Improve K-12 science education by providing teachers and students hands-on experiences in 21st century biology.
- Facilitate interactions and collaborations between researchers and industry to foster the development of new companies in Arizona.
- Strengthen UA's clinical and translational research infrastructure, including core support for study design, data management and bioinformatics, contracts, and human subjects research (Institutional Review Board interface, patient management, long distance clinical collaboration, good clinical practice, and good laboratory practice).
- Enable a statewide clinical science and 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.
- Organize conferences to promote collaborative research initiatives and education on the national and international level.

MANAGEMENT

BIO5 Director **Fernando Martinez** reports to Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development. Dr. Martinez has overall responsibility for the TRIF UA Bioresearch Program and directs BIO5; **Carol Barnes** directs the McKnight Brain Institute, and **M. Peter Lance** directs ACTREC.

BOARDS

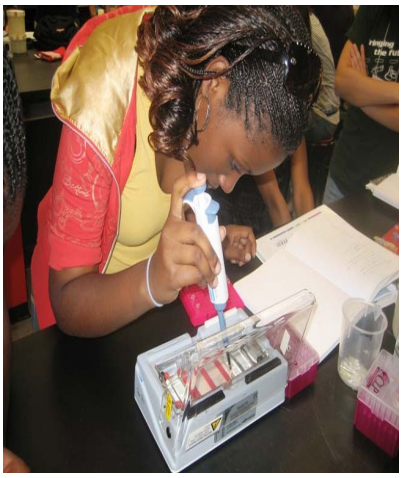
The TRIF Bioresearch Program has a single oversight board consisting of three business leaders in the biotechnology industry, which reviews the reports from each initiative advisory board(s) with the appropriate expertise for evaluating the initiative.

The Oversight Board for the UA TRIF Bioresearch Program consists of **Robert Morrison,** Executive Director, Desert Angels; **Jack Dean,** PhD, Past President of U.S. Science and Medical Affairs, Sanofi-Aventis Pharmaceuticals; **Joseph Jasinski,** PhD, Program Director, IBM Health Care & Life Sciences.

BIO5's External Business Advisory Board includes 15 business leaders from the Tucson region, state and nation. The Science Advisory Board is composed of six nationally renowned scientists in the fields of research represented at BIO5. BIO5's internal advisory committees are made up of Deans and faculty leadership from the colleges that partner with BIO5.

McKnight Brain Institute's external review group is the four Trustees of the McKnight Brain Research Foundation. Its Scientific Advisory Board is composed of seven scientists with expertise and significant research interests in aging and memory.

The UA ACTREC Advisory Board is composed of the Provost and Vice President of Research of the UA, the Director of BIO5 and the Deans of the seven colleges that carry out biomedical research.



LEARN MORE

- Contact **Dr. Fernando Martinez,** Director, Bioresearch Program and Interim Director, BIO5, The University of Arizona, at fernando@arc.arizona.edu or 520-626-4272. Visit the BIO5 website at www.bio5.org
- Contact **Dr. Peter Lance,** Director, Arizona Clinical and Translational Research and Education Consortium, The University of Arizona, at plance@azcc.arizona.edu or 520-626-4492
- 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

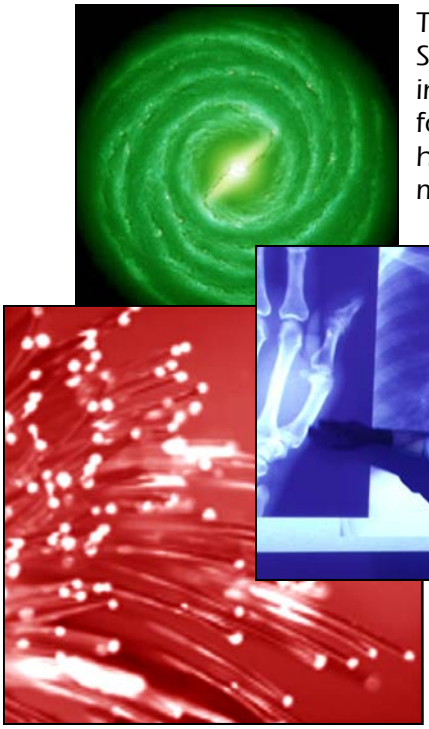
THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND

OPTICAL SCIENCES AND TECHNOLOGY PROGRAM

September 1, 2009

The University of Arizona College of Optical Sciences is home to the TRIF Optical Sciences and Technology Program. The program 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.



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

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James C. Wyant, Ph.D.
Dean, College of Optical Sciences

PERFORMANCE MEASURES

PERFORMANCE MEASURES ($ IN MILLIONS)	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT													
Sponsored Awards	$11.325	$3.398	$19.94	$2.428	$9.677	$16.000	$21.749	$16.350	$31.042	$16.700	$36.499	$25.000	$25.500
Gifts & Other Sources	$ 0.096	$0.019	$0.110	$0.019	$0.080	$ 0.017	$ 0.041	$ 0.034	$ 0.224	$ 0.228	$ 0.269	$ 0.232	$ 0.236
Patent Royalty Income						$ 0.055	$ 0.050	$ 0.060	$ 0.102	$ 0.065	$ 0.085	$ 0.070	$ 0.075
WORKFORCE CONTRIBUTIONS													
New Faculty Hires	3	6	0	1	1	2	3	2	1	2	4	2	2
Growth in optics-related undergraduate enrollment	12	25	44	25	(12)	4	(40)	6	(5)	4	(3)	4	4
Growth in optics-related graduate enrollment	30	15	21	0	23	3	15	4	(4)	3	22	4	4
Growth in optics-related distance learning enrollment	3	48	32	32	23	5	(8)	8	(34)	8	(11)	2	2
TECHNOLOGY TRANSFER & COLLABORATIONS													
New Start-up Companies	2	1	0	0	1	0	0	1	1	0	2	0	1
Patent Applications	15	15	10	17	23	7	21	8	45	15	49	30	32
Invention Disclosures						25	27	27	30	29	34	31	33
OUTREACH & EDUCATION													
Workshops, Seminars and Conferences Supported	7	5	6	6	15	5	17	5	8	5	6	6	6

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 Program Total Expenditures .

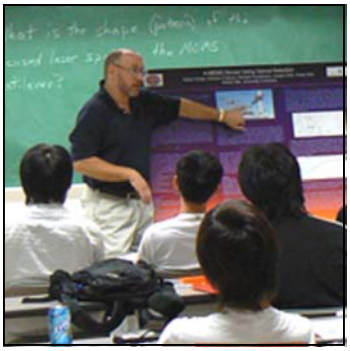
ROI calculation for FY07 to FY11: Annual Sponsored Awards plus Patent Royal income plus Gifts & Other Sources divided by annual TRIF Optical Sciences and Technology Program Total Expenditures. Sponsored Awards, Patent Royalty income and Gifts & Other Sources (i.e. Affiliates funding) included for university personnel receiving TRIF Optical Sciences and Technology Program funding as defined in the ABOR approved ROI Formula

PERFORMANCE ANALYSIS

Research and Technology Development portion of the TRIF Optical Sciences and Technology Program 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 Program 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.



OSC's Dr. Mike Nofziger hosts a week-long summer school for students from the University of Toyota.

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 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE											
Carry Forward	$ -	$ 1,535,952	$ 324,825	$ 366,298	$ 1,230,225	$ 135,586	$ 594,471	$ 852,429	$ 852,429	$ (72,014)	$ -
New TRIF Revenue	$ 4,395,646	$ 4,803,518	$ 4,521,523	$ 4,491,847	$ 4,047,769	$ 3,646,492	$ 3,598,915	$ 3,476,034	$ 2,718,259	$ 2,656,045	$ 2,656,045
TOTAL REVENUE	$ 4,395,646	$ 6,339,470	$ 4,846,348	$ 4,858,145	$ 5,277,994	$ 3,782,078	$ 4,193,386	$ 4,328,463	$ 3,570,688	$ 2,584,031	$ 2,656,045
EXPENDITURES											
Personal Services	$ 1,004,904	$ 1,781,270	$ 2,688,414	$ 2,209,066	$ 2,575,898	$ 2,143,214	$ 2,143,012	$ 3,842,346	$ 2,451,017	$ 2,297,914	$ 2,369,928
All Other Operating Expenses	$ 854,790	$ 3,233,375	$ 791,636	$ 418,854	$ 1, 566,510	$ 1,044,393	$ 1,197,945	$ 486,117	$ 1,191,685	$ 286,117	$ 286,117
Capital	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL EXPENDITURES	$ 2,859,694	$ 6,014,645	$ 4,480,050	$ 3,627,920	$ 5,142,408	$ 3,187,607	$ 3,340,957	$ 4,328,463	$ 3,642,702	$ 2,584,031	$ 2,656,045
Return on Investment	4.0:1	0.6:1	4.5:1	0.7:1	1.9:1	6.8:1	9.4:1	3.9:1	10.1:1	9.8:1	9.7:1

Notes:

1) 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.

2) 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 TRIF Optical Sciences and Technology Program 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 graduate, undergraduate, 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

MANAGEMENT

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

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. **Jeffrey B. Goldberg:** Dean; Engineering, Professor; Systems & Industrial 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:** 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.

LEARN MORE

- Contact **Dr. James C. Wyant**, Dean, College of Optical Sciences at 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 or 520-621-3513
- Visit the College of Optical Sciences Website at www.optics.arizona.edu

THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

WATER AND ENVIRONMENTAL SUSTAINABILITY

THE UNIVERSITY OF ARIZONA
Arizona's First University

September 1, 2009

Arizona's natural resources, most critically its water supplies, are crucial to the state's economy and to the health and well-being of its residents. The most pressing environmental issues of our time are especially apparent in arid and semi-arid regions of the globe where population growth is most rapid and life-supporting resources are most limited. As the leading university in the world with expertise in water, as well as being in the forefront with regard to interdisciplinary work in the earth sciences and environmental studies, the University of Arizona's Water & Environmental Sustainability Program (WESP) is uniquely positioned to use its strengths to support university, industry, and government collaborations in research, technology, education, and outreach to resolve water and environmental resource challenges. The mission of the WESP is to provide science-based technical, economic, legal, and policy expertise, necessary for water and environmental sustainability in Arizona and other semi-arid regions facing increasing demands on natural resources and the uncertainties of environmental change. It is anticipated that the knowledge and techniques generated will have world-wide applications that will stimulate the economy and produce far-reaching societal benefits.

Together, the two components of WESP, the Water Sustainability Program (WSP) and the Translational Environmental Research (TER) initiative will create synergies for UA to be a world leader in interdisciplinary, cutting-edge water and environmental research and in applying results to resolve resource challenges at the state, national, and international level.

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Sharon Megdal, Ph.D.
Director, Water and Environmental Sustainability Program
and
Director, Water Sustainability Program

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT													
Sponsored Awards: ($M)[1]	$ 1.9	$ 2.6	$ 2.4	$ 3.4	$ 3.33	$ 12.2	$ 10.51	$ 15.2	$ 14.7	$ 11.8	$ 20.0	$ 12.8	$ 13.8
Gifts & Other Sources ($M)	$ 0.00	$ 0.012	$ 0.014	$ 0.042	$ 0.09	$ 0.00	$ 0.087	$ 0.085	$ 4.650	$ 0.09	$ 3.8	$ 0.095	$ 0.10
TECHNOLOGY TRANSFER & COLLABORATIONS													
Licenses & Options[2]							1	1	0	2	0	0	0
Patent Applications[3]				4	4	3	3	2	1	2	1	1	1
WORKFORCE CONTRIBUTIONS													
Number of Graduate Students Enrolled[4]						10	28	38	33	38	39	38	48
Undergraduate Trainees[5]	0	9	22	40	40	42	52	43	64	43	74	56	56
Graduate Trainees[6]	1	16	54	75	89	85	68	95	98	95	77	59	59
Postdoctoral Trainees[7]	2	2	3	3	3	4	8	7	6	7	5	5	5
New Faculty Hires	1	0	1	1	4	9	9	2	3	2	3	2	2
CURRICULUM INNOVATIONS & STUDENTS SERVED													
Number of Newly Revised Courses Offered[8]						1	1	1	1	1	2	1	1
OUTREACH & EDUCATION													
Teachers/Educators Trained[9]	0	524	880	1,032	997	950	1,130	979	740	1,008	1,755	1,035	1,070
K-12 Students Benefiting & Participating[10]	0	26,890	29,530	34,745	39,270	29,500	36,182	30,600	32,120	31,700	34,454	32,800	33,900
Communities Assisted						5	7	10	9	10	12	10	10
Workshops, Seminars, & Conferences Supported[11]	1	1	1	1	2	4	5	6	13	6	15	11	11

[1] Total FY08 onward reflects combined total of Translational Environmental Research Initiative that began Jan/07 and the Water Sustainability Program awards previously broken out under Government Grants Received and Additional Funding Obtained. Awards to water centers retroactively added to Actuals prior to FY07. Merged metrics for Translational Environmental Research include Federal Grants received; Private Foundation/Gifts; Other Sources; and Training Grants.

[2] New metric from Translational Environmental Research initiative.

[3] Patent Applications was previously labeled Patent Applications in Process.

[4] Refers to graduate students enrolled in interdisciplinary environmental studies/earth sciences programs and the Graduate Water Policy Certificate program.

[5] Previously labeled Undergraduate Employment/Research Opportunities; includes undergraduate students working on water related TRIF funded research projects, internships, and fellowships.

[6] Previously labeled Graduate Employment/Research Opportunities; includes graduate students working on water related TRIF funded research projects, internships, and fellowships

[7] Previously labeled Postgraduate Employment/Research opportunities; includes postdoctoral candidates working on water related TRIF funded research projects

[8] Number of Newly Revised Courses Offered was formerly called New Water Related University Courses/Certificates/Degrees.

[9] Teachers/Educators Trained FY08 forward includes previous metrics Teachers Trained, Facilitators Trained, and Teachers involved in outreach activities related to water education.

[10] FY08 forward includes previous K-12 Students benefiting (in classrooms) metric, as well as K-12 Students Participating in Water Festivals, and K-12 Students participating in outreach activities (non-formal settings) metric.

[11] Workshops, Seminars & Conferences Supported, FY07 forward, is a combination of WSP and TER initiatives.

* Industry collaborators/Private sector collaborations/Public sector collaborations; Interdisciplinary curriculum modules developed; Communities participating in K-12 outreach activities; Publications produced; Other knowledge transfer products; and Presentations/exhibits metrics were discontinued.

PERFORMANCE ANALYSIS

Return on Investment (ROI): WESP centers, programs and projects are expected to receive sponsored awards and gifts from federal, state and county agencies, municipalities and the private sector, in excess of $10M/per year through FY2011. These funds provide an ROI of greater than 2:1 on the TRIF investment in water and the environment.

Technology Transfer & Industry Collaboration: WESP researchers work to develop and commercialize real world sustainable technologies, measured by licenses and options and patent applications facilitated by the UA Office of Technology Transfer.

Workforce Contributions. Undergraduate, graduate and post-doctoral students gain invaluable experience and career training through employment, assistantships, fellowships and internships. The Interdisciplinary Environmental Studies and Earth Sciences and Water Policy Certificate programs prepare motivated graduate students in specialized areas. New faculty hires help to strengthen UA's ability to tackle complex state water and environmental problems, train students, and compete for new research funds.

Curriculum Innovations: Each year WESP faculty develop new interdisciplinary course offerings to address pressing challenges in water and environmental resources.

Outreach & Education: Over 30,000 K-12 students and more than 700 teachers per year benefit from high quality water education programs across the state. Many workshops, seminars and conferences provide valuable means to disseminate knowledge to decision makers, professionals and the public. Arizona communities across the state benefit from tailored water management assistance.

Jonathan Overpeck, Ph.D.
Director, Translational
Environmental Research

GOALS

WESP's goal is to strengthen research, education, and outreach efforts in water and environmental sustainability at the University of Arizona to enhance economic development and the quality of life for all of Arizona.

WESP is leveraging its strengths in academia, research, and environmental technology to create several outcomes that include:

- practical education for grades K-12 to create general awareness of issues, problems, and career-related training;
- internationally recognized research and technology transfer initiatives;
- 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
- stronger relationships across disciplines within the University of Arizona, which will result in research innovations to create new business initiatives.

These efforts build on the extensive expertise in water resources and environmental and earth science by over 300 UA faculty and staff in 10 colleges and 60 departments and help to promote UA as a national

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE											
Carry Forward	$ -	$ 442,080	$ 95,320	$ 437,798	$ 595,950	$ 689,983	$ 1,861,545	$ 853,293	$ 853,293	$ (53,628)	$ -
New TRIF Revenue	$ 474,283	$ 480,352	$ 2,009,566	$2,460,948	$ 3,907,500	$ 4,645,467	$ 3,993,114	$ 4,296,816	$ 3,360,110	$ 3,283,206	$ 3,283,205
TOTAL REVENUE	**$ 474,283**	**$ 922,432**	**$ 2,104,886**	**$2,898,746**	**$ 4,503,450**	**$ 5,335,450**	**$ 5,854,659**	**$ 5,150,109**	**$ 4,213,403**	**$ 3,229,577**	**$ 3,283,205**
EXPENDITURES											
Personal Services	$ 28,757	$ 502,244	$ 1,135,364	$ 1,585,695	$ 1,917,386	$ 2,447,059	$ 3,219,837	$ 4,642,826	$ 2,864,775	$ 2,810,133	$ 2,863,761
All Other Operating Expenses	$ 3,446	$ 324,868	$ 531,724	$ 717,101	$ 1,336,400	$ 1,026,846	$ 1,751,464	$ 507,283	$ 1,407,349	$ 419,444	$ 419,444
Capital	$ -	$ -	$ -	$ -	$ 559,681	$ -	$ 30,065	$ -	$ (5,093)	$ -	$ -
TOTAL EXPENDITURES	**$ 32,203**	**$ 827,112**	**$ 1,667,088**	**$ 2,302,796**	**$ 3,813,467**	**$ 3,473,905**	**$ 5,001,366**	**$ 5,150,109**	**$ 4,267,031**	**$ 3,229,577**	**$ 3,283,205**
Return on Investment	-	2.2:1	1.2:1	1.5:1	0.9:1	3.0:1	3.8:1	2.3:1	5.6:1	4.0:1	4.2:1:1

Notes:

1) 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.

2) 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.

and global leader in research and technology development.

WESP pursues it's goals and objectives through strategic recruitment and research initiatives; student fellowships and internships; education and outreach programs; and the activities of the individual centers.

MANAGEMENT

Sharon Megdal serves as the Director of the Water and Environmental Sustainability Program (WESP) and the Water Sustainability Program (WSP). Jonathan Overpeck and Diana Liverman are Co-Directors of Translational Environmental Research (TER).

WATER SUSTAINABILITY PROGRAM EXECUTIVE COMMITTEE

Sharon Megdal, Director, WSP and Water Resources Research Center

Raina Maier, Associate Director, NIEHS Superfund Research Program

Ian Pepper, Director, NSF Water & Environmental Technology Center

Farhang Shadman, Director, SRC/Sematech Engineering Research Center for Environmentally Benign Semiconductor Manufacturing

Juan Valdes, Director, NSF Center for Sustainability of semi-Arid Hydrology and Riparian Areas

TRANSLATIONAL ENVIRONMENTAL RESEARCH

Jonathan Overpeck, Co-Director TER and the Institute of the Environment

Diana Liverman, Co-Director TER and the Institute of the Environment

Barbara Morehouse, Deputy Director of Research

Gregg Garfin, Deputy Director of Outreach

ADVISORY BOARDS

The Water Sustainability Program and Translational Environmental Research initiative have independent advisory committees/boards. Each has an academic advisory committee and an external advisory committee. Two members of each external advisory committee represent TER and WSP on the WESP External Advisory Board.

LEARN MORE

- Contact Dr. Sharon Megdal, WESP and WSP Director, smegdal@cals.arizona.edu or 520-792-9591 X21. Visit the WSP website at: www.wsp.arizona.edu
- Contact Dr. Jonathan Overpeck, TER Director, jto@email.arizona.edu or 520-622-9065; Dr. Diana Liverman, TER Co-Director, liverman@u.arizona.edu or 520-626-2910
  Visit the TER website at: www.ispe.arizona.edu/resources/research/ter/about.html
- Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, at tolbert@email.arizona.edu or 520-621-3513

THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

EDUCATION AND INFRASTRUCTURE PROGRAM

THE UNIVERSITY OF ARIZONA
Arizona's First University

September 1, 2009

Critical to the economic viability of Arizona are highly trained workers, accessible quality healthcare, state-of-the-art information systems, and knowledge-based industries. In November of 2000, the Technology and Research Initiative Fund (TRIF) was created through Proposition 301 to support programs aimed at these and other educational needs.

Five initiatives comprise TRIF-funded Infrastructure programs. Individually, they have created new educational programs, expanded access to educational content, and built an infrastructure to move local research efforts to the market place. Combined, they are changing how knowledge is conceived and consumed – on and off campus – and are building bridges to educational, corporate, and health care entities throughout the state and beyond.

Workforce Initiative: The Educator Development Plan *(EDP)* addresses the shortage of highly trained math, science and agriculture science teachers by designing new curricula and supporting program graduates to remain in the state. Direct outcomes are an increase in teaching resources and a direct impact on K-12 students in classrooms with newly certified teachers.

In healthcare, service delivery systems have not kept pace with the explosion of information and technology. College of ***Nursing Online Graduate Degree and Certification Programs*** *(NOP)* expands access to high quality nursing education by delivering course content with distance learning, internet-related technology. The online Nursing Ph.D. program is the first of its kind. New degrees and certificates are being developed to meet the needs not only of students, but of residents throughout the state – particularly in rural areas.

Anyplace Access for Arizonans *(AAA)* responds to workforce and workplace needs by exploiting information and communication technologies to offer the best of public higher education and outreach activities to all Arizonans, regardless of place. Participants seek knowledge and information for use in work and life settings – knowledge that can increase lifelong earnings, improve productivity on the job, and solve practical problems in their daily lives.

Critical Core Infrastructure *(CCI)* centralizes support for selected high technology research fields that depend on laboratory facilities, 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. Investments in research buildings, assuring appropriate laboratory space, occur as debt service. Investments in computing and communications infrastructure occur within the central computing organization, UITS. The goal is to enable research, and by enabling research, to

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Ronald Marx, Ph.D.
Dean, College of Education

PERFORMANCE MEASURES

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT ($ IN MILLIONS)													
Sponsored Awards	$ 0.033	0.973	1.249	3.785	4.820	1.910	4.027	2.020	2.525	2.712	4.132	2.559	2.662
Gifts & Other Sources	$ 0.069	0.277	0.357	0.485	0.781	0.883	0.753	0.943	1.068	0.841	1.150	0.923	1.016
Patent Royalty Income	0.714	1.08	1.010	1.176	1.689	1.520	1.223	1.670	0.690	1.820	.687	1.970	2.110
TECHNOLOGY TRANSFER & COLLABORATIONS													
Invention Disclosures	109	111	95	102	88	135	104	114	99	114	124	135	145
Licenses & Options	18	24	25	32	26	38	30	36	39	36	43	40	45
Patent Applications	62	77	91	106	109	105	121	115	143	115	125	120	125
New Start-up Companies	10	1	7	9	6	14	3	5	5	5	7	6	7
Economic Impact Studies	0	0	1	1	0	1	2	1	0	1	0	1	1
WORKFORCE CONTRIBUTIONS													
Number of Graduate Students Enrolled			19	37	161	316	191	358	241	294	253	307	320
Number of Graduate Degrees Awarded						58	29	40	56	44	56	51	57
Teachers Certified in Undergraduate Level Math & Science	7	12	22	20	24	40	24	40	25	30	27	30	30
Teachers Certified in Master's Level Math & Science	28	25	26	40	24	30	24	30	14	25	14	25	25
Teachers Certified in Agriculture	8	13	16	16	12	15	11	17	13	19	17	20	20
Certificates granted for AAA + Nursing					9	50	0	58	85	84	12	105	128
CURRICULUM INNOVATIONS & STUDENTS SERVED													
Number of Newly Revised Courses Offered *				8	10	14	48	8	14	10	36	11	16
Number of Online Courses Offered	0	10	19	28	28	37	16	9	19	8	61	4	3
OUTREACH & EDUCATION													
K-12 Students Benefitting & Participating	2,150	2,500	3,200	3,800	3,000	4,250	2,950	8,600	2,600	13,300	2600	18,050	22,000
Workshops, Seminars, & Conferences Supported	0	0	1	1	2	2	4	0	0	0	0	0	0
Users of Extension & Workplace Resources**	0	493	58,000	103,000	156,055	200,000	31,415	250,000	225,503*	300,000	5,470,117	350,000	400,000
Enrollments in Web & Hybrid Courses	0	20,450	24,528	35,353	77,557	39,373	104,715	41,085	2,154	2,404	4,624	2,654	2,904
DATA AND RESEARCH ACCESS & NETWORK													
Building Networks Brought to Standards						1	1	1	1	1	1	1	1
Supercomputer Usage						85-90%	90%	85-90%	78%	85-90%	94%	85-90%	85-90%
Percentile-Ranked Access to Advanced Networks						75th or better	75th	75th or better	50th	75th or better	50th	75th or better	75th or better

*Includes courses being developed for Fall 09 and Spring 10 implementation.

**Due to data limitations, "hits" are being reflected in this number for some program categories.

contribute to regional economic development.

Technology Transfer Infrastructure Plan *(TTIP)* supports the UA as a driver of an Arizona knowledge-base economy by moving research to the market place, creating new knowledge-based industries, and bringing UA innovations into broad and public commercial uses. The initiative supports the collaborative environment for research within the 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).

PERFORMANCE ANALYSIS

The *EDP* initiative was successful in producing over 350 certified teachers in math, science and agriculture science during the first five years. These teachers have been employed in schools throughout Arizona and have had a direct impact on K-12 students. We conservatively estimate each teacher will impact 50 students annually. An infrastructure is now in place to efficiently train new teachers and impact increasingly more students.

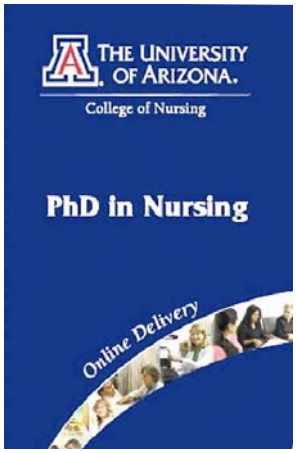
Presently, all College of Nursing graduate courses and one undergraduate course are deliverable in an electronic format. New courses are being developed for distance learning and content from original courses is being reformatted. Student enrollment has increased with production of new courses and external collaborations have been enhanced by the ability to teleconference and remotely monitor student progress in clinical settings. Teleconferencing and streaming video has enabled collaborations with rural and border-based health care delivery organizations.

During 2002-08, *AAA* recruited 12 technical experts with varied specialties needed for producing high quality distance education and high value information resources. Over $3.4 million was secured to support projects to preserve endangered Native American languages, improve science instruction, and develop health education programs. New tools for online learning were introduced that now support over 100,000 enrollments in more

than 2000 individual courses, including an online doctorate in Nursing, the first such program in the country.

Investments in *CCI* were made throughout fiscal years 2002 through 2009, funded through a proportional tax on the budgets of all other initiatives. These investments: (1) Completely renovated building network cabling and equipment for the Meinel Optical Sciences Building, (2) elevated UA Internet2 bandwidth from 155 Mbps to 1Gbps, (3) allowed The UA to join CENIC, a California based research and education network that provides access to National Lambda Rail, (4) doubled the UA's supercomputing capability, and (5) brought immersive 3D visualization technology to campus as a shared resource.

TTIP economic development measures are based upon start-ups licensing relevant UA technology, the number of those start-ups choosing to operate in Arizona, and the number of UA Technologies licensed by existing companies in Arizona. The TTIP plan metrics capture operational scope, efficiency and relevance of OTT. This includes agreements executed, patents and patent applications, and disclosures received. For some of the measures, no projections (N/P) were made in the original planning or metrics for the renewal are changing to better reflect the proposed activities. The Economic analysis by OED was designed to measure the effectiveness of the UA's TRIF initiatives as well as their economic impact on Arizona's economy and its industry clusters.



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

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

GOALS

EDP – (1) To create seamless math and science programs from elementary through secondary school, (2) to support students to enter math, science, and agricultural science teacher preparation programs, (3) to graduate over 450 of these teachers and, (4) to support program graduates to teach locally.

NOP – (1) To increase the quality and years of healthy life for Arizona's populations and contribute toward eliminating health disparities, assuring quality safe health care, and improving the public health infrastructure and (2) to reduce health disparities among Arizona's populations, particularly rural, aging, border and minority populations.

AAA – (1) To make 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 and (2) to create 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.

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE											
Carry Forward	$ -	$ 1,163,205	$ 565,018	$ 553,430	$ 463,409	$ 767,157	$ 557,442	$ 621,658	$ 621,658	$ 289,584	$ -
New TRIF Revenue	$ 2,233,439	$ 2,305,689	$ 2,511,957	$ 2,616,912	$ 3,085,923	$7,951,221	$ 9,164,277	$ 9,807,891	$ 8,444,713	$ 7,099,053	$ 7,062,094
TOTAL REVENUE	**$ 2,233,439**	**$ 3,468,894**	**$ 3,076,975**	**$ 3,170,342**	**$ 3,549,332**	**$ 8,718,378**	**$ 9,721,719**	**$10,429,549**	**$ 9,066,371**	**$ 7,388,638**	**$ 7,062,094**
EXPENDITURES											
Personal Services	$ 415,210	$ 1,355,810	$ 1,628,344	$ 1,915,393	$ 1,760,808	$2,026,007	$ 2,114,858	$ 3,112,603	$ 2,105,147	$ 2,385,367	$ 2,166,235
All Other Operating Expenses	$ 655,024	$ 1,548,066	$ 895,201	$ 791,540	$ 1,009,036	$2,734,929	$ 3,568,734	$ 2,573,011	$ 3,228,290	$ 2,003,271	$ 1,895,859
Capital	$ -	$ -	$ -	$ -	$ 381,200	$3,400,000	$ 3,416,469	$ 4,743,935	$ 3,443,350	$ 3,000,000	$ 3,000,000
TOTAL EXPENDITURES	**$ 1,070,234**	**$ 2,903,876**	**$ 2,523,545**	**$ 2,706,933**	**$ 3,151,044**	**$8,160,936**	**$9,100,061**	**$ 10,429,549**	**$ 8,776,787**	**$ 7,388,638**	**$ 7,062,094**
ROI (See Note 2)	-	-	-	-	-	-	-		-	-	-

Notes:

1) Carry forward for FY 07 consists of the following: Carry forward of $172,938 from Technology Transfer Infrastructure; Carry forward of (3,253) from Anyplace Access for Arizonans; Carry forward of $228,603 from Educator Development Plan; Over-realized revenue of $350,000 for College of Nursing Online Programs; and a technical adjustment of $18,869 from FY 06 for Critical Core Infrastructure. The total technical adjustment was $74,891. $56,022 was recorded under the Venture Fund.

2) 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.

3) 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.

CCI – (1) To continuously upgrade Internet connectivity to research buildings, (2) to provide access for researchers to high performance networks such as CENIC, Internet2, and National Lambda Rail, (3) to provide more, better supercomputing capability, (4) to introduce important new technologies that enable cutting edge research, and (5) to develop new research space for TRIF activities.

TTIP – (1) To enhance the technology transfer infrastructure, (2) to increase significantly the level and breadth of technology transfer from the university, (3) to increase engagement in technology transfer by the faculty, staff and students, (4) to assist efforts to commercialize university technology and (5) to connect these efforts into both State and local community economic development efforts.

MANAGEMENT

Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, is responsible for overall management of the University's TRIF activities. Infrastructure initiatives are coordinated by **Ronald W. Marx,** Dean of the College of Education. Individual initiatives are overseen by the following in concert with faculty, staff, and professional support personnel particular to their area of technical expertise.

EDP – **Ronald W. Marx,** Dean, College of Education

NOP – **Carolyn Murdaugh,** Interim Dean, College of Nursing

AAA – **Mike Proctor,** Dean, Outreach College

CCI – **Michele Norin,** Chief Information Officer and Executive Director, University Information Technology Services

TTIP – **Bruce Wright,** Associate Vice President for Economic Development, and **Patrick Jones,** Director of Technology Transfer

ADVISORY BOARDS

Each initiative has established Advisory Boards that provide input, review planning and operations and, more importantly, serve as a mechanism for building relationships between the UA and educational, health, science, technology, and corporate entities.

3D data visualization – a critical new tool – in use to examine the physics of dust storms

EDP – Representatives from the Professional Preparation Board (PPB) include administrators from Pima College, all Tucson school districts, and faculty from all UA colleges engaged in and related to teacher preparation.

NOP – Representatives from the Arizona Rural Health Association, Area Health Education Centers, Border Health Initiatives, hospitals, Community Health Centers, long term and chronic care facilities, emphasizing rural and border areas within the state as well as individuals associated with agencies promoting distance learning for minority students.

AAA – Advisory groups include the Deans' Advisory Committee, Initiative-wide Advisory Board, Project-specific Advisory Boards, and Project and Technical Support Teams as needed.

CCI – There is no external advisory board for the *CCI*, since these investments are in service of initiatives with their own advisory boards. All IT projects are managed within University Information Technology Services, under the direction of Bob Lancaster for network projects and under the direction of Jim Austin for computing projects, both Directors of UITS 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.

TTIP – Four committees comprised of faculty, corporate, and technology personnel: TTIP Review Committee, Technology Transfer Advisory Committee, Arizona Center for Innovation Advisory Board, and Intellectual Property Committee.

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.

THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND

UA-ASU SOLAR ENERGY INITIATIVE

THE UNIVERSITY OF ARIZONA
Arizona's First University

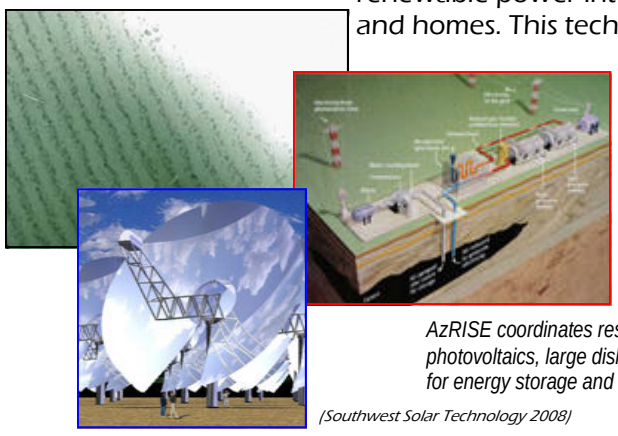
September 1, 2009

AZRISE
The Arizona Research Institute for Solar Energy

The UA-ASU Solar Energy Initiative funds the Arizona Research Institute for Solar Energy (AzRISE). AzRISE joins faculty from science, engineering, optical science, architecture, business and agriculture to pursue development of interdisciplinary revolutionary programs in Research and Development and public policy for the widespread utilization of solar energy.

Through coordination, guidance and stimulated solar energy activities in (1) research and development, (2) economic and public policy analysis, (3) education and (4) outreach, the institute supports competitive and peer reviewed projects in all four areas, putting special emphasis on innovative R&D and on economic analyses that can guide both technical IP development and public policy.

The vision is to establish a world-renown, highly interdisciplinary environment and structure that develops and translates research into useful applications in solar renewable energy. Close synergy among academia, industry, power utilities and policy will accelerate the creation and adoption of distributed renewable power integrated into the electric grid and homes. This technological and societal transformation will achieve an energy-secure, environmentally-sound 21st Century.



AzRISE coordinates research in nanostructured materials for photovoltaics, large dish concentrator optics, and various options for energy storage and desalination.

(Southwest Solar Technology 2008)

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Joseph H. Simmons, Ph.D.
AzRISE Director
Department Head, Materials Science and Engineering

PERFORMANCE MEASURES

	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT ($ in millions)						
Sponsored Awards: ($M)	$ 1.17	$ 2.18	$ 1.75	$ 2.50	$ 2.20	$ 5.80
Federal Awards	$ 0.10	$ 1.08	$ 0.80	$ 2.18	$ 1.00	$ 3.00
Industrial Awards	$ 0.02	$ 0.05	$ 0.25	$ 0.32	$ 0.40	$ 1.00
Other Awards	$ 1.05	$ 1.05	$ 0.70	$ -	$ 0.80	$ 1.80
Gifts & Other Sources	$ 0.00	$ 0.05	$ 0.30	$ 0.64	$ 0.60	$ 1.00
TECHNOLOGY TRANSFER & COLLABORATIONS						
Licenses & options	2	2	2	1	2	2
New Start-up Companies	0	0	1	2	2	3
Patent Applications	0	0	2	2	4	6
Invention Disclosures	0	0	4	6	8	12
WORKFORCE CONTRIBUTIONS						
Number of graduates in solar energy	4	2	10	20	20	30
Number of undergraduates in solar energy	20	20	26	27	26	26
Number of post doctoral associates	1	0	2	2	4	6
CURRICULUM INNOVATIONS & STUDENTS SERVED						
Number of newly revised courses offered	0	0	20	2	100	300
Number of Online Courses Offered	1	1	2	0	4	10
OUTREACH & EDUCATION						
Workshops, seminars and conferences supported	2	5	4	4	4	4

Federal Grants Obtained:

Two DOE proposals were funded with matching funds:

1) SEEDpod Proposal for the Solar Decathlon ($100K DOE with $100K from the UA program)

2) Solar concentrators ($980K from DOE and $102K from the UA program)

PERFORMANCE ANALYSIS

The **Research and Technology Development** portion of AzRISE focuses on development of novel nanostructured materials for photovoltaics, organic photovoltaic technologies, large dish concentrator optics, solar PV reliability and various options for energy storage and desalination 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 projected externally funded research awards and technology transfer transactions are direct measures of this activity.

Workforce Development is a major objective of AzRISE. The workforce development effort will consist of increasing the numbers of graduate and undergraduate students doing research and taking courses in solar energy-related topics. Additional focus will be on postdoctoral associates in solar energy research and on students in solar energy courses onsite and offered through distance learning.

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

AzRISE Solar Racing Car Team

GOALS

AzRISE will promote solar energy through research, education and strategic partnerships to:

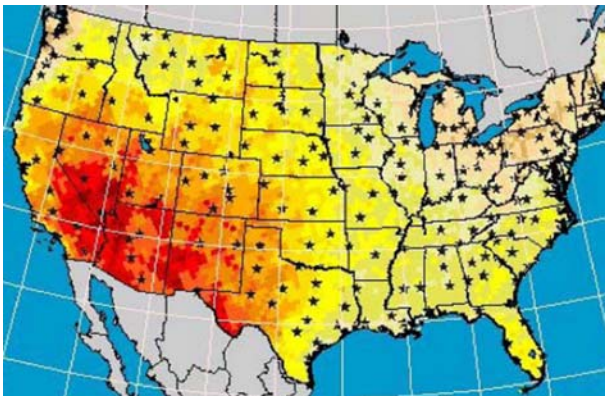
- Discover, innovate and develop to market evolutionary and revolutionary science and technology in solar energy utilization
- Develop the local economy by providing technology solutions and economic incentives/ drivers that are transitioned to partner companies and industries, as well as support an environment that stimulates and nurtures startup efforts.
- Educate the next-generation workforce and prepare citizens for the renewable energy society.

FINANCIAL INFORMATION

	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE						
Carry Forward	$ —	$ 979,762	$ 825,124	$ 825,124	$ (15,648)	$ —
New TRIF Revenue	$ —	$ 70,238	$ 700,000	$ 547,400	$ 611,272	$ 611,272
TOTAL REVENUE		**$ 1,050,000**	**$ 1,525,124**	**$ 1,372,524**	**$ 595,624**	**$ 611,272**
EXPENDITURES						
Personal Services	$ —	$ 148,944	$ 1,525,124	$ 956,765	$ 519,224	$ 611,272
All Other Operating Expenses	$ —	$ 75,932	$ —	$ 431,407	$ 76,400	$ —
Capital	$ —	$ —	$ —	$ —	$ —	$ —
TOTAL EXPENDITURES	**$ —**	**$ 224,876**	**$ 1,525,124**	**$ 1,388,172**	**$ 595,624**	**$ 611,272**
Return on Investment	-	9.9:1	1.3:1	2.3:1	4.7:1	11.1:1

MANAGEMENT

Dr. Joseph H. Simmons, Director of AzRISE, reports to **Dr. Leslie Tolbert**, Vice President for Research, Graduate Studies, and Economic Development, for the TRIF Solar Energy Program.



ADVISORY BOARDS

Dean's Advisory Committee
Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development; **Thomas Peterson**, Dean, College of Engineering, Professor, Chemical & Environmental Engineering; **Joaquin Ruiz**, Dean, College of Science, Professor, Geosciences.

Technical Review Committee
Roger Angel, Regents' Professor, Astronomy, and Optical Science; **Neal Armstrong**, Professor Chemistry and Optical Sciences, **Ardeth Barnhart**, Associate Director, AzRISE; **Eric Betterton**, Head and Professor, Atmospheric Sciences; **Dale Clifford**, Assistant Professor Architecture; **Nasser Peyghambarian**, Professor; Optical Sciences, Materials Science & Engineering, Chair; Lasers & Photonics; **B.arrett Potter**, Associate Professor, Materials Science and Engineering

External Advisory Committee
John Madocks, President, General Plasma, Inc.; **Adam Honea**, Provost, University of Phoenix; **Herb Hayden**, President, Southwest Solar Technologies; **Sarah Kurtz**; National Renewable Energy Laboratory; **Jim Gentile**, Director, Research Corporation; **Dick Hayslip**, Associate General Manager, Salt River Project.

AzRISE / Tucson Electric Power (TEP) Solar Test Yard, an interdisciplinary research project to acquire and distribute data in the measurement of solar panel performance, PV production models and studies in techniques that increase the energy yield from PV systems.

LEARN MORE

- Contact **Dr. Joseph H. Simmons**, Director, AzRISE, and Department Head, Materials Science and Engineering, at *simmonsj@email.arizona.edu* or 520-621-6070
- Contact **Dr. Leslie Tolbert,** Vice President for Research, Graduate Studies, and Economic Development, at *tolbert@email.arizona.edu* or 520-621-3513
- Contact **Ardeth Barnhart**, Associate Director, AzRISE, at *ardethb@email.arizona.edu* or 520-322-2970
- Visit the AzRISE Website at *www.AzRISE.org*

THE UNIVERSITY OF ARIZONA

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

HIGHER EDUCATION IN RURAL SOUTHERN ARIZONA

THE UNIVERSITY OF ARIZONA
Arizona's First University.

September 1, 2009

The Higher Education in Rural Southern Arizona TRIF Initiative was funded in December 2007 from the Regents TRIF Innovation Fund (TIF) to address the special needs of Southern Arizona as a distinct economic region. The initiative's primary goal is to develop a repertoire of high-demand hybrid and electronic courses and degree programs focused on regional needs, made available in partnership with community colleges, and supported by a network of highly accessible and technologically adept faculty.

The initiative is focused on three interdependent components of an economic development triangle: teacher education, commerce/entrepreneurship, and information science-based programs relevant to regional industry, ranging from defense and intelligence to import/export logistics.

Program costs are reduced via four mechanisms: 1) significant community investment in infrastructure; 2) reliance on a small number of dedicated faculty living in target communities or delivering electronic or hybrid content locally and to other communities; 3) focusing our investment on a small number of high-demand, high-quality degree programs; and 4) working closely with our community college partners. This model allows all students to have regular access to live faculty, though those faculty may travel from main campus or serve multiple communities, and each community has access to online content for a broader menu offering than would normally be available in each community.

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Mike Proctor
Dean, University of Arizona
Outreach College

PERFORMANCE MEASURES

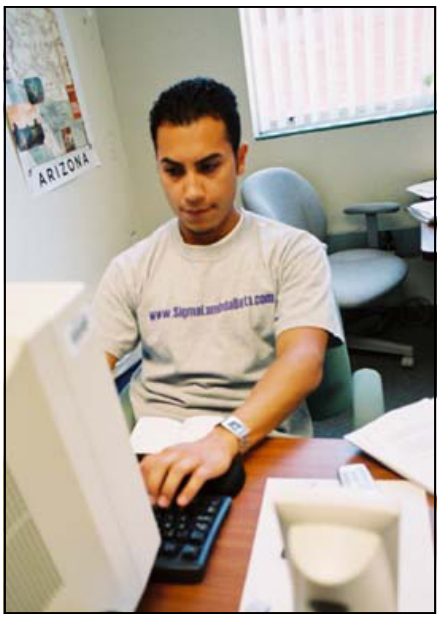
	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT						
Sponsored Awards	$ 0	$ 0	$ 100,000	$ 124,925	$ 150,000	$ 150,000
Gifts & Other Sources	$ 0	$ 0	$ 200,000	$ 52,009	$ 200,000	$ 200,000
WORKFORCE CONTRIBUTIONS						
Number graduate students enrolled within initiative	0	0	2	130*	4	8
Number graduate degrees awarded	0	0	1	0	2	4
Number of undergraduate degrees awarded	0	0	0	0	20	30
Number undergraduates enrolled	0	0	30	44*	40	50
Total student credit hours produced	0	0	300	107	300	300
Number certificates granted for Higher Ed	0	0	15	0	20	30
Number new certificates offered	0	0	2	1**	2	2
CURRICULUM INNOVATIONS AND STUDENTS SERVED						
Number of newly revised courses offered	0	0	2	2**	4	6
Number new online courses offered	0	0	15	18**	15	15
OUTREACH AND EDUCATION						
Teachers/Educators Trained	0	0	12	14***	18	24
Number enrollments in web & hybrid courses	0	0	30	169*	80	120

* Includes students currently enrolled for FY10.
** Includes courses/training modules/workshops/certificates under development for delivery in FY10.
*** Includes teachers/educators currently enrolled for training in FY10.

Note: Proposal projections for FY08 were shifted to FY09 due to fund timing issues. Although funds were approved in December '07, expenditures could not occur prior to Regents approval of business plan in August '08.

PERFORMANCE ANALYSIS

Early program investments include: our Nogales Learning Center (UA Santa Cruz); UA South's Teacher Education program; UA main campus business communication certificate; Lesson Link, a teacher resource program; and online science teacher prep courses. Fall enrollments are meeting or exceeding expectations. Moreover, these funds effectively jumpstarted long overdue collaboration between UA Main and UA South. In addition, we have aggressively leveraged these funds against additional resources, dramatically expanding online content through Spring and Fall 2009 in several additional teacher education and information science programs, significantly increasing access for time- and place-bound students throughout the region.



GOALS

The goal of this initiative is to provide, through integrated 4-year degree programs involving our community college partners, teacher education, commerce/entrepreneurship and information science degrees and certificates throughout Southern Arizona in a revenue-positive and sustainable fashion. We originally projected enrollment to increase by an average of 40 students per year to a minimum of 120 students region-wide within three years, but enrollments in funded courses will likely exceed this number by nearly 50% this fall. We expect that this large increase in students will lead to a measurable increase in the number of certified teachers entering the workforce, and will make a significant contribution to meeting the demand for industry-driven degrees. We also expect to contribute significantly to defense, intelligence and security programs available throughout the region.

FINANCIAL INFORMATION

	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget
REVENUE					
Carry Forward	$ -	$ -	$ 500,000	$ 500,000	$ 427,085
New TRIF Revenue	$ -	$ 500,000	$ 310,594	$ 242,885	$ 191,026
TOTAL REVENUE		$ 500,000	$ 810,594	$ 742,885	$ 618,111
EXPENDITURES	$ -				
Personal Services	$ -	$ -	$ 810,594	$ 118,218	$ 618,111
All Other Operating Expenses	$ -	$ -	$ -	$ 197,582	$ -
Capital	$ -	$ -	$ -	$ -	$ -
TOTAL EXPENDITURES	$ -	$ -	$ 810,594	$ 315,800	$ 618,111
ROI (See Note 1)	-	-	-	-	-

1) As a non-research initiative and pursuant to the new March 2007 Return on Investment (ROI) policy, ROI will not be calculated in FY 2008-2010.

2) 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

Leslie Tolbert, Vice President for Research, Graduate Studies, and Economic Development, is responsible for the overall management of the University's TRIF activities. Direct oversight of this initiative is assigned to **Mike Proctor**, Dean, University of Arizona Outreach College.

ADVISORY BOARDS

Immediate initiative oversight is provided by the Vice President for Outreach's advisory board, a mix of internal and external individuals who are charged with evaluating the broad strategy of the Outreach Office. A subcommittee of that board is evaluating the business plan for this initiative.

In addition, this board will rely on input from a small group of deans and department heads focused on academic content, and on local advisory councils in Pinal and Santa Cruz Counties to be established by the locally embedded Outreach Coordinators. Ultimate financial and administrative oversight is the responsibility of the Vice President for Outreach.

Advisory Board Members:

Iman Hakim, Dean, Public Health

Sherry Hoskinson, Director, McGuire Center for Entrepreneurship

Bob Lusch, Department Head, Marketing

Rick Myers, Retired IBM Executive, Former Southern Arizona Leadership Council Chairman

Dave Naugle, Administrator/Corporate Public Affairs, Southwest Gas Corporation

David Smallhouse, Real Estate and Business Ventures

Telly Stanger, Manager of Economic Development, Sulphur Springs Valley Electric Cooperative

Mary Staugaard, Associate Director, Credit Programs, University of Arizona Outreach College

LEARN MORE

- Contact **Mike Proctor,** Dean, University of Arizona Outreach College, The University of Arizona, at mproctor@arizona.edu or 520-621-7687.
- 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 www.vpr.arizona.edu for more information on the individual initiatives.

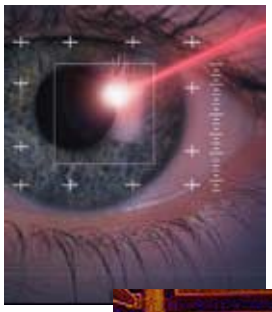
THE UNIVERSITY OF ARIZONA

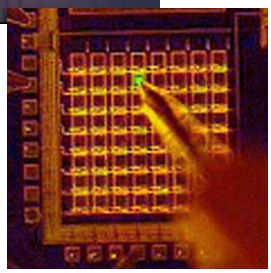
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

VENTURE FUND

THE UNIVERSITY OF ARIZONA.
Arizona's First University.

September 1, 2009





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 would be related to the theme of an existing University of Arizona TRIF initiative and would be administered through that initiative. Venture Funds have been 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 Executive Vice President and Provost and the Vice President for Research, Graduate Studies, and Economic Development of the

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Meredith Hay, Ph.D.
Executive Vice President and Provost

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.

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

PROJECTS FUNDED IN FY 2009

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

- Biodiversity Informatics (Bioresearch); $222,100
- Bio5 Institute (Bioresearch); $250,000
- Az Center for Math & Education (Education & Infrastructure); $50,000
- McKnight Hire & Institute Support (Bioresearch); $331,400
- College of Nursing (Education & Infrastructure); $60,000
- Optical Sciences Licensing Associate (Optical Sciences & Technology); $130,000
- Technology Transfer Licensing Associate (Education & Infrastructure); $170,000
- Institute of the Environment (Water & Env. Sustainability); $438,117
- Water Centers (Water & Env. Sustainability); $250,000

FINANCIAL INFORMATION

	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
Carry Forward	$ -	$ 68,123	$ 487,543	$ 172,779	$ 143,603	$ 143,603	$ 54,420	$ -
New TRIF Revenue	$ 68,123	$ -	$ 714,079	$ 430,455	$ 126,514	$ 29,953	$ 5,580	$ 36,444
TOTAL REVENUE	**$ 68,123**	**$ 68,123**	**$1,201,622**	**$ 603,234**	**$ 270,117**	**$ 173,556**	**$ 60,000**	**$ 36,444**
EXPENDITURES								
Personal Services	$ -	$ -	$ 891,417	$ 457,864	$ 270,117	$ 94,207	$ 60,000	$ 36,444
All Other Operating Expenses	$ -	$ 68,123	$ 137,426	$ 1,767	$ -	$ 24,929	$ -	$ -
Operations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL EXPENDITURES	**$ -**	**$ 68,123**	**$1,028,843**	**$ 459,631**	**$ 270,117**	**$ 119,136**	**$ 60,000**	**$ 36,444**

*$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.

*Venture fund budget and expenditures are shown in the individual initiatives financial information table.

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 or 520-621-3513

- Visit the University of Arizona TRIF website at www.vpr.arizona.edu/trif

FY 2007-2011 ASU-UA Joint Biomedical Research Fund

Arizona State University
The University of Arizona

September 1, 2009

Arizona State University and the University of Arizona jointly administer the TRIF-funded *Collaborative on Biomedical Research Grant Program* with ten awards originally scheduled to total $2,000,000 ($1,000,000 each) in FY07 and $1,000,000 ($500,000 each) per year in FY08-FY11.

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 University of Arizona College of Medicine-Phoenix in partnership with Arizona State University 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. 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; and,
- Potential for impact on overall State-wide strength in biomedical sciences.

The program awarded $2,000,000 in FY07 and $1,000,000 in FY08 to the ten projects through a competitive process. Due to the economic downturn and growing shortfall in TRIF revenues, the projects were ended in FY09 and drew to a close in June 2009 with the principal investigators having submitted their final reports. UA and ASU are working with the principal investigators of the BIO5 Institute and the Biodesign Institute to continue the creation of collaborative research projects between our institutions.

The TRIF support resulted in 68 scientific presentations and publications and the submission of proposals valued at $19.5M for external support for the continuation of these projects.

Title	PI	Total TRIF Award	Total Publications and Presentations	Total Pending Proposals and Awards
Proteomic and Metabolomic Biomarker Investigation of Type 2 Diabetes [(1)]	Nelson-ASU Lau-UA	$250,000	11	$5,853,000
Geno- and Immuno-Signatures in Acute Asthma	Johnson-ASU Martinez-UA	$297,977	8	$3,421,175
Development of a Rapid Immunosignature Diagnostic Test for Valley Fever	Magee-ASU Shubitz-UA	$320,000	0	$1,520,431
Molecular Therapeutics Collaborative Program between BIO5 and BioDesign Institutes	Hecht-ASU Hurley-UA	$325,000	3	$0
Rapid Biomarker Analysis for Emergency Medicine	Posner-ASU Wirth-UA	$325,955	2	$2,020,737
A Network-Science Approach to Normal- Tissue Organization and Carcinogenesis	Lai-ASU Gatenby-UA	$325,955	7	$0
A Digital Media Based Biofeedback System for Neural Rehabilitation	Rikakis-ASU Baldwin-UA	$325,955	10	$5,100,425
Evaluating the Role of VDR Polymorphisms and B-Catenin Signaling in Colorectal Adenoma Risk	Jurutka-ASU Thompson-UA	$177,248	15	$1,250,000
Selective Modulation of Basal Ganglia Excitability: A Potential Gene Therapy for Parkinson's Disease	Tillery-ASU Falk-UA	$325,955	6	$0 (planned NIH-R01 application in 2010)
Novel Superluminescent LEDs and Ultrahigh-resolution for OCT for Medical Imaging Applications	Zhang-ASU Barton-UA	$325,955	6	$382,044

[(1)] Patent Disclosure M8-049L, U.S> Provisional #61/069,674, International PCT application #PCT/US2009/037369 for Biomarkers and assays for Diabetes

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Expansion of the Phoenix Biomedical Campus
The University of Arizona

September 1, 2009

1. COM Phoenix Lease

   Lease costs of $1,140,000 for the lease of the renovated Phoenix Union High School for the College of Medicine-Phoenix were paid in FY 2007. Starting in FY 2008, this lease was covered by State appropriations to the College of Medicine-Phoenix and "lease" funds were used to covering growing operations and maintenance costs through Critical Core Infrastructure and Expansion of the Phoenix Biomedical Campus (#2 below).

2. COM Phoenix Operating, Maintenance, and Utility Costs

   Operating, maintenance, and utility costs of $833,000 were paid for the College of Medicine – Phoenix in FY 2007. These costs escalated in FY 2008 with the opening of Arizona Biomedical Collaborative building 1. In FY 2008, funds in the amount of $1,141,000 were allocated to cover increased operating, maintenance, utility, and research compliance costs including Risk Management and Radiation Safety. State appropriations allocated to the College of Medicine-Phoenix will cover some of these growing costs starting in FY 2009.

3. Pharmacy Match

   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. These funds have been used to support the salary of the experimental education director for the Phoenix program, who coordinates the fourth-year training of pharmacy students completing rotations in the greater Phoenix area, develops new clinical training sites, and oversees the community outreach/health education programs there, including programs with the City of Phoenix.

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

   An allocation of $72,000 was budgeted in FY 2007 as a one-time expense to provide internet connectivity for the College of Medicine – Phoenix complex. Funds were being expended through the University Information Technology Services (UITS) to lease communications services to connect the College of Medicine - Phoenix to the UA Tucson via the Sterling Telecom Hotel. An additional $72,000 was provided through the Venture Fund in FY 2008 to cover this expense.

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PLANNING FOR PHOENIX BIOMEDICAL CAMPUS (PBC)

Status Report on Activities Related to the
Health Sciences Education Building (HSEB), Arizona Biomedical Collaborative II (ABC II), and the Phoenix Biomedical Campus Comprehensive Development Plan

September 1, 2009

1. Project Status:

Planning for the Phoenix Biomedical Campus (PBC) projects has progressed considerably over the past year, with the guidance and participation 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. Following is a summary of related events and accomplishments:

- In June 2008, the Arizona Legislature approved the Stimulus Plan for Economic and Education Development (SPEED) initiative that will provide $470 million of funding for the PBC projects. This funding will allow both the HSEB and ABC II projects to move forward;

- CO Architects, in association with Ayers Saint Gross, the master planners for the site, were selected as the Design Consultants for the PBC project. They are working with the Executive Committee and user groups to refine the project space program that will form the basis of the project design;

- The selection process was completed for the Construction Manager at Risk (CMR) for the project and the team of Sundt/DPR was chosen.

- The University of Arizona (UA) will have primary responsibility for project administration with regard to project contracting and financial management. The UA will provide project management support as needed to David Harris, who will lead the overall on-site PBC project management team.

- The PBC projects were included in the June, 2008 Capital Development Plans of each of the three universities and were approved by the Board of Regents. The SPEED project funding was approved at the July 24th Board meeting.

- In January 2009 the legislature, in special session, passed SB 1006 reducing the total budget for the project to $376 million necessitating substantial redesign and value engineering.

2. Proposed Schedule:

- Programming for the Phase 1 project was completed in Fall of 2008. Schematic design for Phase 1 is also complete. We will expedite the remainder of the design process to allow construction to begin as soon as possible. The construction documents may be prepared in as many as six separate bid packages to allow for the most effective fast-tracking process.

- We currently anticipate that construction could begin in early 2010, with required site preparation and utilities work. Considering the size and complexity of these projects, we anticipate that construction of the HSEB building will be completed for use in the fall of 2012, and that the completion of the ABC II building will follow.

3. Issues to be Resolved:

- Final results of the FY 2009/2010 Budget

- Funding, financing and cash flow strategies for the 20% portion of this SPEED funded project that the universities must provide.

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. In FY 2007, $344,300 was expended. In FY 2008, $972,700 was spent on construction manager fees, consultant fees, and project management fees. We utilized the remaining $183,000 of TRIF funding for the completion of programming of the HSEB and ABC II projects until the SPEED project funding becomes available.

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

GRAND SUMMARY

	FY 2007 ACTUAL	*FY 2008 ACTUAL*	*FY 2009 REV BUDGET*	*FY 2009 ACTUAL*	*FY 2010 BUDGET*	*FY 2011 BUDGET*
REVENUE						
Carry Forward	$ 1,277,429	$ 1,280,867	$ 985,091	$ 1,001,977	$ 744,040	$ -
TRIF Revenue	4,916,171	2,050,760	1,925,000	1,507,934	1,384,400	1,700,000
TOTAL REVENUE	**$ 6,193,600**	**$ 3,331,627**	**$ 2,910,091**	**$ 2,509,911**	**$ 2,128,440**	**$ 1,700,000**
EXPENDITURES						
OPERATING BUDGET						
Personal Services	$ 154,893	$ 131,974	$ 155,000	$ 150,596	$ 190,000	$ -
ERE	42,970	39,445	45,000	46,707	53,000	-
All Other Operating	63,849	162,185	176,574	161,579	171,596	-
Subtotal Operating Budget	**261,712**	**333,604**	**376,574**	**358,882**	**414,596**	**-**
GRANTS/PROJECTS:						
Regents Innovation Fund	1,119,236	1,207,048	1,661,385	1,046,879	1,290,585	1,500,000
Arizona Regents Reach Out (ARRO) Grants	443,404	495,289	594,211	224,272	423,259	200,000
TRIF Strategic Investments (TSI) Carryforward to FY 2010/2011	250,000	-	250,000	-	-	-
Subtotal Grants/Projects	**1,812,640**	**1,702,337**	**2,505,596**	**1,271,151**	**1,713,844**	**1,700,000**
EXPENDITURES GRAND TOTAL	**$ 2,074,352**	**$ 2,035,941**	**$ 2,882,170**	**$ 1,630,033**	**$ 2,128,440**	**$ 1,700,000**
SUMMARY BY INITIATIVE						
Regents Innovation Fund[1]	$ 1,265,329	$ 1,434,503	$ 1,925,959	$ 1,316,863	$ 1,560,585	$ 1,500,000
Arizona Regents Reach Out (ARRO) Grants	559,023	601,438	706,211	313,170	539,934	200,000
TRIF Strategic Investments (TSI)[2] Carryforward to FY 2010	250,000	-	250,000	-	27,921	-
EXPENDITURES GRAND TOTAL	**$ 2,074,352**	**$ 2,035,941**	**$ 2,882,170**	**$ 1,630,033**	**$ 2,128,440**	**$ 1,700,000**

[1] To avoid double counting, above FY 2008 and FY 2009 amounts do not include $500,000 of Regents Innovation Fund revenue and expenditures that were allocated to UA for HRAA CTSA and are included in UA's reports. This $500,000 in FY 2008 and FY 2009 is included, however, on the Emerging Issues page in the Regents Innovation Fund section.

[2] TSI funds were allocated to the universities in FY 2008 and in FY 2009 and will be allocated to the universities in FY 2010. Therefore, TSI revenues and expenditures are not included in these ABOR central office numbers but will be included in the universities' reports.

ABOR CENTRAL OFFICE

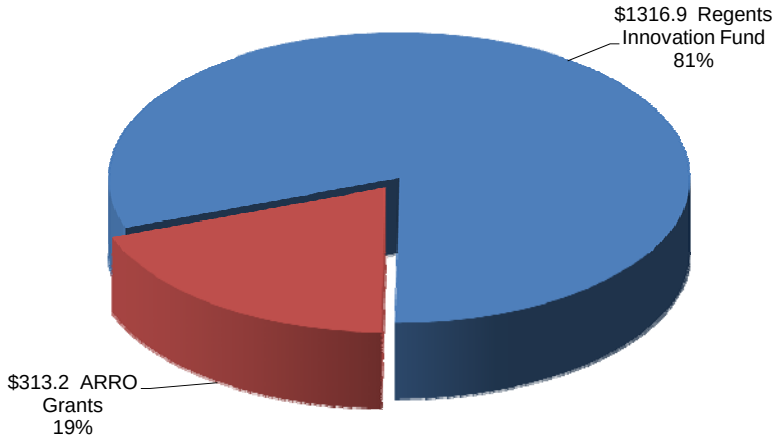
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

SUMMARY BY PROGRAM AREA

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*
REVENUE		
Carry Forward	$ 985,091	$ 1,001,977
TRIF Revenue	1,925,000	1,507,934
TOTAL REVENUE	**$ 2,910,091**	**$ 2,509,911**
EXPENDITURES		
OPERATING BUDGET		
Personal Services	$ 155,000	$ 150,596
ERE	45,000	46,707
All Other Operating	176,574	161,579
Subtotal Operating Budget	**376,574**	**358,882**
GRANTS/PROJECTS:		
Regents Innovation Fund	1,661,385	1,046,879
Arizona Regents Reach Out (ARRO) Grants	594,211	224,272
TRIF Strategic Investments (TSI) Carryforward	250,000	-
Subtotal Grants/Projects	**2,505,596**	**1,271,151**
EXPENDITURES GRAND TOTAL	**$ 2,882,170**	**$ 1,630,033**

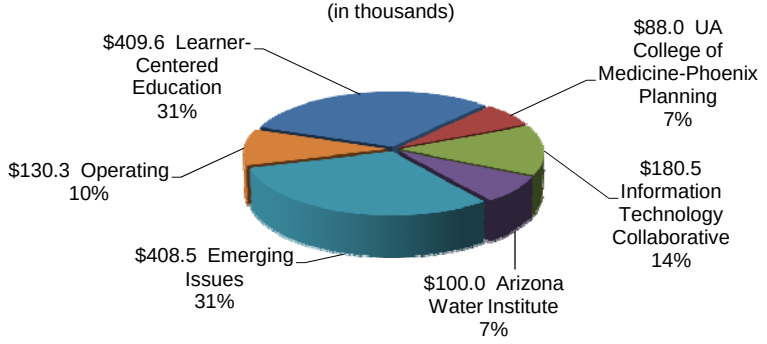
FY 2009 CENTRAL OFFICE ACTUAL TRIF EXPENDITURES (in thousands)



Regents Innovation Funds do not include $500,000 allocated to UA for HRAA CTSA.

SUMMARY BY INITIATIVE		
Regents Innovation Fund:		
Learner-Centered Education	$ 800,000	$ 409,648
UA College of Medicine-Phoenix Planning	110,000	88,000
Information Technology Collaborative	255,000	180,456
Arizona Water Institute (AWI)	100,000	100,000
Operating	110,000	130,266
Statewide Transfer Articulation System	50,000	-
Emerging Issues	500,959	408,493
Total Regents Innovation Fund	1,925,959	1,316,863
Arizona Regents Reach Out (ARRO) Grants	706,211	313,170
TRIF Strategic Investments (TSI) Carryforward	250,000	-
EXPENDITURES GRAND TOTAL	**$ 2,882,170**	**$ 1,630,033**

REGENTS INNOVATION FUND
(in thousands)



ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND SUMMARY

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 850,959	$ 850,959	$ 376,185
TRIF Revenue	1,075,000	842,089	1,184,400
TOTAL REVENUE	**$ 1,925,959**	**$ 1,693,048**	**$ 1,560,585**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ 80,000	$ 92,899	$ 110,000
ERE	20,000	25,125	28,000
All Other Operating	164,574	151,960	132,000
Subtotal Operating Budget	**264,574**	**269,984**	**270,000**
GRANTS/PROJECTS:			
Learner-Centered Education	645,426	269,930	150,000
The University of Arizona College of Medicine-Phoenix Planning	110,000	88,000	110,000
Information Technology Collaborative	255,000	180,456	180,000
Arizona Water Institute (AWI)	100,000	100,000	-
Statewide Transfer Articulation System	50,000	-	-
Emerging Issues	500,959	408,493	850,585
Subtotal Grants/Projects	**1,661,385**	**1,046,879**	**1,290,585**
EXPENDITURES GRAND TOTAL	**$ 1,925,959**	**$ 1,316,863**	**$ 1,560,585**
SUMMARY BY INITIATIVE			
Learner-Centered Education	$ 800,000	$ 409,648	$ 270,000
The University of Arizona College of Medicine-Phoenix Planning	110,000	88,000	110,000
Information Technology Collaborative	255,000	180,456	180,000
Arizona Water Institute (AWI)	100,000	100,000	-
Operating	110,000	130,266	150,000
Statewide Transfer Articulation System	50,000	-	-
Emerging Issues	500,959	408,493	850,585
EXPENDITURES GRAND TOTAL	**$ 1,925,959**	**$ 1,316,863**	**$ 1,560,585**

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

Learner Centered Education Course Redesign Initiative (LCE-CRI)

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 300,000	$ 300,000	$ 244,780
TRIF Revenue	500,000	387,750	25,220
TOTAL REVENUE	**$ 800,000**	**$ 687,750**	**$ 270,000**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating (NCAT Contract)	154,574	139,718	120,000
Subtotal Operating Budget	**154,574**	**139,718**	**120,000**
GRANTS/PROJECTS:			
FY 2010 LCE Grants			150,000
FY 2009 LCE Grants	300,000	-	-
FY 2008 LCE Grants	345,426	269,930	-
Subtotal Grants/Projects	**645,426**	**269,930**	**150,000**
EXPENDITURES GRAND TOTAL	**$ 800,000**	**$ 409,648**	**$ 270,000**

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

LEARNER CENTERED EDUCATION

September 1, 2009

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: The First Five Years

Over five funding cycles from 2002 through 2006, 11 to 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. Funding for the last year of this five-year period culminated in September 30, 2007. Examples of these projects include:

- The Writing Network (UA), in which undergraduate English education majors, Writing Center tutors, and composition students worked with high school students on the skills they need to pass the AIMS test;
- Learner-Centered Assessment tools (ASU Poly and ASU West), which created a comprehensive library of online tools for developing, assessing, and improving learner-centered education; and
- TIMES (Training Engineering and Math for Engineering Success, NAU), which tested a online training activities and tools designed to improve student performance in their entry-level engineering foundation courses.

The Tri-University collaboration on learner-centered practice (2004).

Program Evaluation. 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

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LEARNER-CENTERED EDUCATION AWARDS, 2002-2009

LCE PROJECTS AWARDED 2002-2006

	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	00	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**
TOTALS:	11	$349,266	14	$538,936	16	$495,211	18	$570,878	20	$527,059	**79**	**$2,481,350**

2007-2009 LCE COURSE-REDESIGN INITIATIVE PROJECTS

	Redesigned Courses	Total Project Funding	Enroll-ment[1]	Annual Projected Savings[1],[2]	Average Reduction in Cost Per Student[1]
ASU	ACC 230: Uses of Accounting Information I	$25,143	Project funding discontinued after pilot semester[3]		
ASU	CHM 101: General Chemistry	$100,000	4,540	$254,240	**16%**
ASU	College Algebra	$25,000	Project funding discontinued after pilot semester[3]		
ASU	CSE 180: Computer Literacy	$51,763	2,196	$48,312	**44%**
ASU	GLG 101 Introduction to Geology I, Physical	$52,911	2,200	$72,600	**36%**
ASU	MGT 300 Organizational Behavior and Lead-ership	$49,665	360	$78,840	**59%**
ASU	CMN 225: Public Speaking	$41,178	600	$120,000	**58%**
ASU	WST 100 Women and Society WST 300 Women in Contemporary Society	$45,218	2,800	$58,800	**27%**
NAU	BIO 181 Introductory Biology	$24,719	Project funding discontinued after pilot semester[3]		
NAU	PSY 101 Introduction to Psychology	$49,992	2,000	$36,000	**30%**
UA	MCB 181: Introductory Biology	$50,000	1,730	$152,240	**33%**
UA	CHEM 103/104: Fundamentals of Chemistry	$49,911	4,000	$100,000	**13%**
UA	NATS 101 A Geological Perspective	$50,331	1,200	$302,400	**58%**
	TOTALS:	**$615,831**	**21,626**	**$1,223,432**	**37% (avg)**

[1]These figures represent actual program results as documented in final project reports based on Fall 2008 activity.
[2]Overall savings calculations are based on reductions in cost per student at original (pre-redesign) enrollment levels. However, cost-per-student reduction may also come through an increase in total enrollment capacity at no or minimal increase in overall instructional cost.
[3]Three projects were discontinued following pilot phase primarily for staffing and timing issues. "Total Project Funding" represents 50% of initial approved award.

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 ACTUAL	FY 2008 ACTUAL	FY 09 REV. BUDGET	FY 2009 ACTUAL	FY 2010 BUDGET
REVENUE										
Carry Forward	-	$ 297,864	$ 307,772	$ 293,560	$ 18,965	$531,621	$ 418,027	$300,000	$300,000	$244,780
TRIF Revenue[1]	969,239	560,008	16,500	500,000	101,428	300,000	428,222	500,000	387,750	25,220
TOTAL REVENUE	$ 969,239	$ 57,872	$ 824,272	$ 93,560	$ 820,393	$831,621	$ 846,249	$800,000	$687,750	$270,000
EXPENDITURES										
OPERATING BUDGET										
Personal Services	$ 3,133	$ 2,962	$ 9,365	$ 5,180	$ 9,959	$ 8,397	-	-	-	-
ERE	744	2,461	1,491	828	2,502	2,064	-	-	-	-
All Other Operating	2,469	5,254	2,121	1,575	831	60,307	137,544[2]	154,574[2]	139,718	120,000
Subtotal Operating	$ 6,326	$ 0,677	$ 2,977	$ 7,583	$ 13,292	$ 40,768	$ 137,544	$154,574	$139,718	$120,000
GRANTS/PROJECTS:										
FY 2002-06 LCE Grants	$ 567,107	$ 554,488	$ 14,212	$ 454,666	$ 264,880	$339,360	$ (36,524)	-	-	-
FY 2007 LCE Grants	-	-	-	-	-	-	-	-	-	-
FY 2008 LCE Grants	-	-	-	-	-	-	345,426	345,426	269,930	-
FY 2009 LCE Grants	-	-	-	-	-	-	-	300,000	-	-
FY 2010 LCE Grants								-	-	150,000
Subtotal Grants/Projects	$567,107	$ 554,488	$ 514,212	$ 454,666	$ 264,880	$339,360	$ 308,902	$645,426	$269,930	$150,000
EXPENDITURES, GRAND TOTAL	$ 573,433	$ 575,165	$ 527,189	$ 462,249	$ 278,172	$410,128	$ 446,446	$800,000	$409,648	$270,000

[1] 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.
[2] Contract payouts for National Center for Academic Transformation (NCAT)

(from page 1)

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.

LCE COURSE REDESIGN INITIATIVE

As a result of the study, in January 2007 the Board embarked on a two-year LCE initiative based on the successful course redesign model pioneered by the National Center for Academic Transformation (NCAT). The LCE Course Redesign Initiative (CRI), to be managed by NCAT consultants, focused on the redesign of large-enrollment, multi-section "gateway" or key undergraduate courses to:

- Demonstrably improve student learning outcomes
- Reduce per-student costs of instruction
- More effectively align existing institutional resources
- Develop internal capacity to redesign additional courses beyond the project funding period

The LCE CRI program, which ends Sept. 2009, is funded through the Regents Innovation Fund for the 2007-2011. Two years of funding ($500,000 per year, FY 2007-08 and FY 2008-09), or a total of $1,000,000, has been designated for these projects.

2007-09 LCE CRI Funded Projects

From February through July 2007, project teams consisting of faculty and administrators at each University were coached through a structured process involving intensive analysis and planning as the foundation for their final redesign proposals. In all, 13 projects were selected and guided through a pilot phase, and 10 projects continued through full implementation of their redesigned courses in Fall 2008. In June 2009, NCAT released its report on the results of the projects, addressing the questions:

- **Did student learning improve?**
  - 5 = Yes, scores improved measurably
  - 2 = Yes, scores showed no difference but course is more challenging
  - 2 = No, no difference
- **Did course completion rates improve?**
  - 5 = Yes
  - 3 = No difference, but course was more difficult or course completion rates were already high
  - 2 = No, no difference
- **Were instructional costs reduced?**
  - 10 = Yes
- **Will the redesign be sustained after the grant period is over?**
  - 8 = Yes
  - 2 = Questionable

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(from page 3)

Student Enrollment. More than 14,000 students were enrolled in, and thus directly impacted by, the redesigned courses during the Fall 2008 semester. Total *annual* enrollment of the redesigned courses is estimated at more than 21,000. Many of the projects plan to further increase enrollment as part of the ongoing redesign, raising the number of students impacted even higher in coming semesters.

Cost Reduction Results. Across all 10 completed redesign projects, NCAT calculated total annual cost reductions at $1,223,432—a reduction of 28%, compared with the costs of the traditional course formats. The *average* course-level cost reduction was 37%. Using the NCAT model, the redesigns saved an average of $93 per student in instructional costs, ranging by course from $18 to $252 per student. Strategies for achieving these cost reductions include:

- Transferring portions of the class to on-line or distance-learning format
- Integrating technology into the teaching/learning experience and/or classroom management
- Reconfiguring the staffing
- Reconfiguring space to accommodate larger numbers of students
- Increasing student-enrollment capacity without additional resources

Looking Ahead . . .

NCAT's rigorous analysis of all project data provides the foundation for solid decision-making about the next steps for the Learner-Centered Education grant program. Faculty participating in this initial LCE CRI grant cycle are enthusiastic about providing leadership within 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 initial $1.2 million. The LCE Advisory Council, in consultation with LCE CRI faculty team members, is considering options for continuing, expanding, and/or revising the LCE grant program and will present recommendations to the Academic Affairs Committee, with the expectation of initiating a new round of LCE program funding by the end of 2009.

PERFORMANCE MEASURES / DELIVERABLES	2002	2003	2004	2005	2006	2007 –2009
Number of courses modified to LCE focus	95	123	104	68	72	10
Faculty addressing curriculum 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	20,000-25,000 annually

Oversight of the LCE Program

ABOR Academic Affairs Committee (AAC) provides oversight for the LCE program, approves funding for grants and approves substantive changes to grant process/criteria.

2009-2010 members: Regents Dennis DeConcini (chair), LuAnn Leonard, Bob McLendon, Ernest Calderon (ex-officio) and Ross Meyer (ex-officio); the three university provosts: Betty Capaldi, ASU; Liz Grobsmith, NAU; and Meredith Hay, UA; and ex-officio members Joel Sideman, ABOR; William Culbertson, faculty; and Nicole Pasteur, NAU.

The LCE Advisory Council provides operational support and recommends projects for funding to the AAC.

2009-2010 members: *Provost Appointees*: Arthur Blakemore, ASU; Don Carter, NAU; and Gail Burd, UA. *Arizona Faculties Council:* William Verdini, ASU; Charles Connell, NAU; and JC Mutchler, UA.

For More Information:

- Visit the LCE link on the home page of the Arizona Board of Regents website, at 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

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

The University of Arizona College of Medicine-Phoenix, in partnership with Arizona State University Planning

	FY 2009 BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ -	$ -	$ -
TRIF Revenue	110,000	88,000	110,000
TOTAL REVENUE	**$ 110,000**	**$ 88,000**	**$ 110,000**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	**-**	**-**	**-**
GRANTS/PROJECTS:			
Molera Alvarez Group	110,000	88,000	110,000
To be determined	-	-	-
Subtotal Grants/Projects	**110,000**	**88,000**	**110,000**
EXPENDITURES GRAND TOTAL	**$ 110,000**	**$ 88,000**	**$ 110,000**

THE UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE-PHOENIX, IN PARTNERSHIP WITH ARIZONA STATE UNIVERSITY

FY 2009 RESULTS AND ACCOMPLISHMENTS

FY 2009 TRIF 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). Phase One of the College of Medicine-Phoenix consists of the three former Phoenix Union High School (PUHS) buildings, one housing the Virginia G. Piper Auditorium, and the first Arizona Biomedical Collaborative research building (ABC 1). Also located on the PBC is the Translational Genomics Research Institute (TGen) research building.

Phase One facilities on the PBC supported the inaugural class of 24 first-year medical students who arrived in July 2007. To accommodate those students plus the second class of 48 first-year students who entered in July 2008, the College of Medicine acquired additional classroom space across the street at the Mercado Center. Another 48 first-year students arrived in July 2009 requiring more classroom space at the Mercado, bringing total enrollment in the College of Medicine-Phoenix to 120 students. Phase Two facilities will be necessary to expand the College of Medicine-Phoenix class size beyond the current level, with a goal of expanding the size of the first-year class, over time, to 120 students per year as space and faculty recruitments permit.

The Stimulus Plan for Economic and Educational Development (SPEED) authorized in 2008 by the Legislature was scheduled to provide $470 million for two new buildings on the PBC. With the downturn in the national and Arizona economies, this funding was decreased to $376 million and is now at risk. Phase Two projects will provide teaching space needed to expand the College to its full capacity of 120 first-year students each year. 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 space and clinical space required to accommodate expanding faculty appointments.

The Phase Two plan for expansion of the PBC provides for a Health Sciences Education Building (HSEB); a second research building (ABC 2), which includes 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 at least 500 cars. The total estimated square footage for Phase Two is approximately 618,000 GSF, not including parking. Site work construction was scheduled to begin in the fall of 2009, with a planned completion of the HSEB planned for the fall 2012 academic term. Due to the uncertainties surrounding the SPEED funding, construction is now scheduled to

being in the spring of 2010, with completion planned for the fall 2012 term. Construction of ABC 2 and the research cores will be completed about a year after HSEB, contingent upon the availability of funding.

The team of CO Architects and Ayers Saint Gross is proceeding with the detailed programming requirements of the education facility. Meeting with some dozen user groups and oversight committees, the project team is verifying and refining requirements, as well as determining with the users how facilities and services might be shared among programs. Schematic design is nearing completion.

Health Sciences Education Building (HSEB)

The Health Sciences Education Building (HSEB) will include classrooms, a state-of-the-art simulation center, pre-clinical training suites, anatomy laboratories, library and learning resource center, and faculty offices for UA, ASU, and NAU. The facility will provide a unique opportunity to train healthcare professionals in an integrated environment, empowering them to become national leaders in interprofessional education and ultimately, delivery of healthcare. Estimated square footage for the HSEB is 268,000 GSF.

Arizona Biomedical Collaborative 2 (ABC 2) Research Building

Arizona Biomedical Collaborative 2 (ABC 2) will accommodate approximately 50 principal investigators from UA, ASU, and NAU. Its core facilities will support the researchers in ABC 1 and 2 and, potentially, research organizations based on the Phoenix Biomedical Campus, such as TGen. This facility will focus on disease-based translational research in the areas of cancer, neuroscience, diabetes, and cardiovascular disease. Dedicated laboratory space will be augmented with the shared research core that will include a vivarium, advanced imaging modalities, data center, and other infrastructure necessary to support an active research agenda. Estimated square footage for ABC 2 is 350,000 GSF.

Space in ABC 2 will be dedicated for the work of the Health Research Alliance Arizona (HRAA). This will include clinical research space designed to support a statewide application for the collaborative Clinical and Translational Science Award (CTSA) grant application. The HRAA space will link 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 HRAA space is 10,000 GSF.

Results

The expansion of the College of Medicine-Phoenix class size to 120 students will be accommodated by the planned Health Sciences 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 a cadre of clinical faculty physicians, both employed by the UA and volunteers from our teaching faculty in the greater Phoenix area.

FY 2010 OVERVIEW

Next Steps

Developing a truly integrated and interprofessional campus will create a shared core of education and student support spaces supplemented by spaces dedicated to specific colleges or programs. Where this model has been implemented on other medical school campuses, some strategies employed have included:

- Highly flexible spaces with limited fixed furniture
- Ample “small group” sized rooms (10-30 students per)
- Large spaces that can be subdivided to accommodate different group sizes
- All classrooms and lecture halls to be centrally scheduled
- Shared use, e.g., by the College of Medicine, ASU College of Nursing & Healthcare Innovation, the UA College of Pharmacy, and the NAU Health Professions Program, of specialized facilities, such as clinical skills exam rooms
- Centralized classroom support staff for maintenance, audio-visual (AV), and information technology (IT)
- Flexibility in class scheduling for maximum utilization of all classrooms

A study addressing the capacity of the Phoenix Biomedical Campus 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, has been completed.

FY 2010 GOALS/OBJECTIVES

1. Complete planning, programming, and design; secure funding; and break ground for the Health Sciences Education Building (HSEB).
2. Continue planning, programming, and design of ABC 2.

FY 2009 ACTUAL/FY 2010 PROJECTED PERFORMANCE MEASURES/DELIVERABLES

		FY 2009 Projected	FY 2009 Actual	FY 2010 Projected
	Return on Investment			
1.	Complete planning, programming, and design of HSEB.	Completed	In progress	Completed
2.	Begin construction of HSEB.	Fall 2009	-	Spring 2010
2.	Complete planning, programming, and design of ABC 2.	Completed	In progress	In progress
			-	-
	Partnerships/Collaborations			
4.	Continue collaborative effort among UA, ASU, and NAU.	Ongoing	Ongoing	Ongoing
5.	Continue collaborative effort with City of Phoenix.	Ongoing	Ongoing	Ongoing

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

Information Technology Collaborative

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 75,000	$ 75,000	$ -
TRIF Revenue	180,000	139,590	180,000
TOTAL REVENUE	**$ 255,000**	**$ 214,590**	**$ 180,000**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	**-**	**-**	**-**
GRANTS/PROJECTS:			
SharePoint Project	-	940	-
Collaborative Supercomputing	75,000	75,000	-
Projects to be determined	180,000	-	80,000
Moran Consulting	-	99,716	100,000
Design 44 (ABOR website design)	-	4,800	-
Subtotal Grants/Projects	**255,000**	**180,456**	**180,000**
EXPENDITURES GRAND TOTAL	**$ 255,000**	**$ 180,456**	**$ 180,000**

INFORMATION TECHNOLOGY COLLABORATIVE

FY 2009 INITIATIVE OVERVIEW

Collaborative Information Technology (IT) projects that can improve service and/or result in cost savings or enhance IT security continue to be of particular interest to the Regents. A consultant has been engaged to facilitate UA's Mosaic project implementation, which includes Human Resources, Student Administration, Research Administration, and Financial and Business Intelligence systems. SharePoint for the ABOR central office and a new Arizona Board of Regents website continue to be implemented. Various possibilities exist for the efficient and effective use of seed money, such as support of tri-university collaborative IT projects and possibly to help provide matching funds for various federal stimulus projects.

FY 2009 GOALS/OBJECTIVES

1. Continue implementation of SharePoint.
2. Arizona Board of Regents website redesign.
3. Oversee consultant for Mosaic implementation at UA.
4. Continue implementation of the Tri-University Identity Federation (ATIF) for Arizona University System and collaborative university Supercomputing project.

FY 2009 PERFORMANCE MEASURES/DELIVERABLES

		Projected	*Actual*
	Return on Investment		
1.	Implementation of major central office functions using SharePoint.	On Schedule	Completed and Ongoing
2.	Consulting on the Arizona Board of Regents website redesign.	On Schedule	Ongoing
3.	Moran consulting on UA Mosaic project.	On Schedule	Ongoing
	Partnerships/Collaborations		
4.	Reporting on the Tri-University Identity Federation project and Collaborative University Supercomputing project.	On Schedule	Ongoing

FY 2009 RESULTS AND ACCOMPLISHMENTS

1. SharePoint sites have been implemented for the Legal, Audit, Capital, Technology Oversight, and Programs committees. In addition, the Regents Resource Center, master calendar, and numerous other sites were developed. An Academic Programs Inventory system was completed, and a Capital Projects system is nearly complete. This virtual private network is a continuous process as additional Board of Regents and central office processes are refined and automated.
2. A consultant was retained to assist in the redesigning of the Arizona Board of Regents website.
3. A consultant reported quarterly to the Technology Oversight Committee on the status of the UA Mosaic project.
4. Regular progress reports on the Tri-University Identity Federation (ATIF) project and the collaborative university Supercomputing project were provided to the Technology Oversight Committee.

FY 2010 INITIATIVE OVERVIEW

A consultant to monitor The University of Arizona's $90 million Mosaic project to implement Human Resources, Student Administration, Research Administration, and Financial and Business Intelligence system was engaged for a three-year period. SharePoint for the central office continues to be implemented and will need modest additional financial support for training and enhancements. The new Arizona Board of Regents website redesign project continues to be implemented. Numerous possibilities exist for the efficient and effective use of seed money for collaborative IT projects.

FY 2010 GOALS/OBJECTIVES

Additional goals and objectives will be provided when final IT projects are selected.

1. Continue implementation of SharePoint.
2. Continue redesign of the Arizona Board of Regents website.
3. Oversee consultant for monitoring the UA Mosaic system implementation.
4. Continue reporting on the Tri-University Identity Federation (ATIF) for Arizona University System project and the collaborative university supercomputing project.

FY 2010 PERFORMANCE MEASURES/DELIVERABLES

		Projected
	Return on Investment	
1.	Implementation of major central office functions using SharePoint, including Regents Resource Center.	On Schedule
2.	Redesign of the Arizona Board of Regents website.	On Schedule
3.	Oversee consultant for monitoring the UA Mosaic systems implementation.	On Schedule
	Partnerships/Collaborations	
4.	Report on Tri-University Identity Federation project and the Collaborative University Supercomputing project.	Ongoing

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

Statewide Transfer Articulation System

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 50,000	$ 50,000	$ -
TRIF Revenue	-	-	-
TOTAL REVENUE	**$ 50,000**	**$ 50,000**	**$ -**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	**-**	**-**	**-**
GRANTS/PROJECTS:			
Software interface	50,000	-	-
ATASS Web Design	-	-	-
Projects to be determined	-	-	-
Subtotal Grants/Projects	**50,000**	**-**	**-**
EXPENDITURES GRAND TOTAL	**$ 50,000**	**$ -**	**$ -**

STATEWIDE TRANSFER ARTICULATION SYSTEM

FY 2009 INITIATIVE OVERVIEW

Arizona Transfer Articulation Support System (ATASS) Website:

The Board authorized the expenditure of $42,000 of FY 2009 Regents Innovation Funds for the redesign of the Arizona Transfer Articulation Support System (ATASS) website. The redesign was completed in August of 2008. It was anticipated that the new look and improved navigation would increase the use and satisfaction with the website, and the usage is up overall 25% for the year. More significantly, the peak month in 2009 doubled the peak month for 2008 (2,189,217 hits in 2009 compared to 1,235,071 hits in 2008). ABOR is part of a statewide team seeking a grant through the Lumina Foundation for Education under the Making Opportunity Affordable (MOA) initiative. Should that grant be awarded to Arizona, analysis of the ATASS website (satisfaction, usage patterns, etc.) will be done in preparation for additional improvements and expansion of the website. If the grant is not awarded, alternatives to doing this analysis will be considered.

Software to Upload Courses

The community colleges and universities were notified in Fall 2007 that the Arizona Board of Regents was funding the licensing and installation of software to make it easier for students to upload their courses to determine transferability to other institutions. The allocated amount was $70,500. Institutions were given 18 months, or through December 2008, in which to participate. The progress on this project has been much slower than expected. However, of the four community colleges that indicated interest in installing the software last year, two have gone “live” and two have made the arrangements for the installation. All community colleges were notified again during Fall 2008, and it was promoted at a meeting of the community college chief academic officers. Should Arizona receive the Lumina MOA grant, it is expected that the remaining schools will install the software as part of the web improvements.

FY 2009 GOALS/OBJECTIVES

1. Implement the new design by September 2008. **Completed.**
2. Install software at all 10 community college districts and 3 universities for transcript upload (December 2008). **Partially completed.**

FY 2009 PERFORMANCE MEASURES/DELIVERABLES

	Return on Investment	
1.	Increased use of ATASS website	25% increase in one year; usage doubled for the peak month.
2.	Increased 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 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

Arizona Water Institute (AWI)

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ -	$ -	$ -
TRIF Revenue	100,000	100,000	-
TOTAL REVENUE	**$ 100,000**	**$ 100,000**	**$ -**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	**-**	**-**	**-**
GRANTS/PROJECTS:			
The University of Arizona	100,000	100,000	-
Subtotal Grants/Projects	**100,000**	**100,000**	**-**
EXPENDITURES GRAND TOTAL	**$ 100,000**	**$ 100,000**	**$ -**

ARIZONA WATER INSTITUTE (AWI)
FY05 - FY09 ACTUAL

	FY 2005 Actual (*)	FY 2006 Actual (**)	FY 2007 Actual	FY 2008 Actual	FY 2009 Budget***	FY 2009 Actual
REVENUE						
Carry Forward	$ -	$ -	$ 57,951	$ 48,987	$ 57,891	$ 57,891
NEW TRIF Revenue	$ 37,500	$ 150,000	$ 200,000	$ 200,000	$ 100,000	$ 100,000
Total Revenue	**$ 37,500**	**$ 150,000**	**$ 257,951**	**$ 248,987**	**$ 157,891**	**$ 157,891**
EXPENDITURES						
Personnel Services	$ -	$ 82,894	$ 192,312	$ 181,080	$ 157,891	$ 150,536
Other Operating	$ 37,500	$ 9,156	$ 16,652	$ 10,016	$ -	$ 6,932
Total Expenditures	**$ 37,500**	**$ 92,049**	**$ 208,964**	**$ 191,096**	**$ 157,891**	**$ 157,468**

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

Director and Administrative Associate.

***ABOR funds will be supplemented with funds from other sources to pay the Director's and Admin Support salaries and operating costs for FY 2009

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2008-2009 AWI Annual/Final Report

This is a report of AWI's activities in calendar years 2008–2009, which were the third and fourth formal years of existence of the Arizona Water Institute. Included is summary of financial material that serves as the final report for the Arizona Water Institute.

This report includes the following major topics:

- AWI Highlights of 2008–2009
- Building Applied Research Capacity
- 2008–2009 AWI Sponsored Projects
- Jacobs/AWI Outreach Activities
- AWI Operations
- Funding and Fundraising

I. AWI Highlights of 2008–2009

Since its inception, AWI has initiated 60 projects (including faculty incentive grants), 33 of which have been completed, and 5 contracts. There are 27 projects still underway that will be finalized after AWI has formally been disbanded. We have also coordinated or sponsored/cosponsored 2 field trips and 23 workshops/conferences. A summary of the outcomes of the projects from the first two years of project funding is included (Attachment 1).

We brought in a total of $1.65 million in cash and matching funds, and $618,583 of in-kind contributions for our projects in the last three years. In addition, our investments led to a series of successful externally funded grants, resulting in $2.69 million in additional income to the three universities.

Key highlights from the past year include:

1) Successful completion of 15 AWI projects on schedule.
2) 63 project concept proposals received and 15 approved for 2009 (many subsequently cancelled upon the decision to shut down by July 1, 2009).
3) Agreement from the Bureau of Reclamation to extend the Colorado River project – Enhancing Water Supply Reliability through Enhanced Use of Climate Predictions – for at least another two years.
4) Completed a detailed summary of project outcomes from all of our projects, and 2-page color handouts (available on the web and included with this report) on all completed grant-funded projects.
5) Eight workshops sponsored, some co-sponsored with other entities.
6) Development of the Strategic Plan for the Bi-national Institute for Water and Renewable Energy.
7) Responded to an ever-increasing demand for information from AWI, including 46 invited talks (Jacobs only - this does not include talks given by other AWI employees and collaborators that relate to our work).
8) Received a grant from Christy Walton through the International Community Foundation to initiate a bi-national water training program in La Paz, Mexico – consisting of a series of 6

workshops (three completed, three more in planning stages, to be completed at the end of this year by Placido dos Santos).

9) Through a collaborative effort at UA between SAHRA, Biosphere 2, AWI and the Institute of the Environment, we hired a new Assistant Research Professor of Informatics, Matthew Garcia.
10) Substantial contract work in multiple areas was negotiated with the Central Arizona Project; two projects have proceeded (the CAP ADD Water Project and the Yuma Desalination Plant project with Wendell Ela and Peter Fox). At the time of the decision to shut down AWI, several additional large projects were still in negotiation, including a monitoring project with Karl Flessa for several hundred thousand dollars, and a project on water and land use on the Colorado River was contemplated.
11) We were invited to give a Sackler Colloquium by the National Academy of Sciences on the topic of "Informing Priorities for Water Sustainability Research through Dialogues between Decision Makers and Scientists."
12) We gave an invited paper on Arizona Water Management Innovations in Zarragosa, Spain.
13) We initiated a thorough evaluation of our program in collaboration with a graduate student at ASU, Clea Senneville, who is completing this assessment of AWI as a "boundary organization" as her master's project in the School of Sustainability. She has interviewed most major players in AWI, including many board members, PIs and staff.

AWI employees Jacobs, dos Santos, and Graf all serve on numerous advisory committees. This year new requests for my participation included:

- Chair, Adapting to the Impacts of Climate Change Committee, National Academy of Sciences, and Member, America's Climate Choices Committee
- Colorado River Hydrology Advisory Board – US Bureau of Reclamation
- NOAA Climate Service Development Tiger Team
- NOAA Climate Services Development Review Panel
- Science Steering Group – Water Cycle Inter-Agency Working Group, US Climate Change Science Program Office (current)

II. Building Applied Research Capacity

Since January 1, 2008, we worked towards building larger scale, higher impact projects as well as expanding the ability of the universities to respond to stakeholder needs.

- In partnership with Harvard University, Arizona State University and the Water Resources Research Center, we sponsored a very successful workshop on climate change adaptation for water managers on February 4-5, 2008, at the Biosphere 2 facility. This has led to several publications and ongoing work in this area.
- On February 21-22, 2008, we sponsored a workshop on energy-water sustainability in the border region (in support of the Bi-national Institute for Water and Renewable Energy) at ADWR, attended by roughly 60 people, with simultaneous translation and multiple breakout sessions.
- In collaboration with Biosphere 2, we supported two workshops, one on energy and water conservation and one on the development of their strategic plan (Jan-Feb 2008).
- We assisted the Arizona Water Pollution and Control Association in a workshop to define priority research needs in March, then sponsored a state of research workshop at the opening session of their annual meeting in May 2008 (attended by 500 people).
- In September 2008, we co-sponsored a Weather Modification workshop at NAU.
- On October 29, 2008, we sponsored an innovative workshop on defining Arizona's Research Agenda in Tempe, featuring the first-ever Arizona's Got Talent Show for water researchers.
- A two-part workshop on surface water-groundwater hydrology is being produced jointly with the Bureau of Reclamation on April 23, 2009, and in the fall of 2009 (this activity is sponsored by Reclamation funding, not AWI, and will continue to move forward).
- We have coordinated the first 3 of a series of 6 workshops in La Paz, Mexico, which were funded by the International Community Foundation to initiate a bi-national water training

program.
- I coordinated a workshop at ASU in February 2009 for the Reclamation downscaling project and have been building funding and staffing for this project.

Because it is clear that information technology will be a critical component of building adaptive capacity, and because our investment in the Arizona Hydrologic Information System (AHIS) needed to be managed more directly, in the summer of 2008 we hired Matthew Garcia as the UA director for AHIS. He previously worked at the NASA Goddard Space Center and has great proficiency in working with complex data bases in multiple formats. He has made major progress in moving the project forward and is currently planning 4 grant proposals in collaboration with his AHIS colleagues at ASU and NAU, as well as other colleagues at UA.

We have been working on several other fronts related to capacity building – assisting tribal entities through several of our grants, working with watershed groups and communities to address specific sustainability issues, working on identifying priority research needs for water treatment and wastewater operations, and supporting efforts to build an employment pathway for water and wastewater treatment plant operators with Gateway Community College, among other examples. I have been working with the Tucson-Pima County Water and Wastewater Infrastructure Planning Committee, helping to define their planning process, select speakers, and develop and review documents, as well as presenting to the committee on water reliability. I have also produced several proposals related to building climate adaptation centers and enhancing the impact of UA research through a proposal called "Research Hits the Road."

We have continued to add to our list of collaborators and project sponsors. There are a total of 101 entities with whom AWI has collaborated on projects and programs.

III. 2008–2009 AWI Sponsored Projects

A. Grant-Funded Projects

AWI's project approach this year changed substantially from that used in previous years. Historically, though our projects were managed very differently from other grants, they were selected by a relatively classical 3-level review panel approach. This year we requested that applicants submit "project concepts" rather than proposals. At the end of August, AWI announced availability of up to $600,000 in funding for collaborative grants, and soliciting concept-level ideas for new projects.

The new approach to the grants process was expected to result in a smaller group of larger, more strategic projects, with at least one project anticipated in each of the research theme areas. Maximum funding per project was to be $100,000, but projects were expected to include significant cash matching (50% or more of the total budget). Some top priority projects were selected even though they are unable to obtain significant matching funds – mostly funding for workshops and white papers focused on research proposals. AWI expected to put extensive AWI staff resources into the development, oversight and in some cases the actual work for each funded project. A few of the selected projects are still moving forward despite the decision to shut down AWI functions July 1. Availability of faculty incentive grants and student internship opportunities was also advertised on all three campuses and a few of those projects will move forward.

B. Other Priority AWI Projects

I am the project manager for the AWI–US Bureau of Reclamation project, "Enhancing Water Supply Reliability through Improved Climate Predictions." We are in the fifth year of this major project that involves four PIs (soon to be five) in four different UA departments and five RAs/Post docs.

Significant outcomes of the project to date include further extending the tree ring record for the Upper Colorado to the prehistoric period, an extension of roughly 1200 years. Project investigators are also developing a new method for predicting precipitation within watersheds based on sea surface temperatures, and multiple publications including *Eos, Journal of the American Water Works Association, Bulletin of the American Meteorological Society, Journal of Geophysical Research, Water Resources Research*, etc. The economics team has been supporting Reclamation assessments of innovative water marketing techniques such as auctions. This team has been selected to receive a "Partners in Conservation" award from the Secretary of the Interior.

AWI has been the Arizona coordinator of the Arizona-Sonora Bi-national Institute for Water and Renewable Energy. AWI held a major conference in February and prepared a summary, serving as the key convener of this effort. Placido dos Santos has played a significant ongoing role in US-Mexico discussions of water and energy and was able to assist in selection of an Arizona firm for work on desalination efforts in Rocky Point.

IV. Jacobs/AWI Outreach Activities

In the past 12 months, I prepared and gave 46 presentations and we organized or co-produced 10 conferences and workshops. Placido and Chuck, the AWI Associate Directors, gave an additional 10 presentations. The presentations of the AWI Campus Coordinators are not itemized in this report. We prepared a total of 18 public handouts for AWI. We now have a set of handouts that can be used for different audiences that were updated on a regular basis, including 2-page project summaries for all of the completed projects that are available as handouts and on-line.

- The AWI website was updated weekly and continues to be well used and received.
- I appeared in a national documentary, "Running Dry in the Southwest", and was filmed for two other documentaries on drought and water supply issues in the west (no ETA on either of the other two, but the Running Dry documentary has been playing nationwide on public television).
- A mailing list of over 2,300 individuals has been receiving the AWI e-newsletters (three were prepared during 2008).
- In the last year, I have appeared on KUAT TV twice – once related to the National Academy panel on climate change, once on a panel reviewing the Running Dry movie.

V. AWI Operations

A. AWI Central Staff/Support

SAHRA continued to provide office space, furnishings, computer and administrative support for the central office. Although we had a major setback in our administrative functions for this year and had only a half-time student for support for 6 months, we hired a new Program Manager in November, Mary Lovely. She has been doing an excellent job. Our student, Stephanie Polm has been amazing, keeping the AWI office functioning from April through November. She took on most of the functions of our office with virtually no notice or training, and has been our web master for the past year. Rachel Nielsen at the UA VPR office has provided excellent administrative support on all our business transactions.

Now that we are in shut-down mode, AWI staff transitions have already begun. Anna Spitz, who had been the UA Coordinator, has moved on to a job with the B2 Institute and the UA SkyCenter. Jim Holway, who has been managing the ASU-AWI office more or less single-handedly since his assistant Jina Olbinski moved on, has accepted a position at the Sonoran Institute. Paul Gremillion and Abe Springer have shared the coordination activities at NAU; Abe will now become the Director of a new Earth Sciences School at NAU, and Paul will continue on as a faculty member at the university. Mary Lovely and Stephanie Polm, who will be laid off as a result of the AWI closure, are actively seeking other employment.

B. AWI Meeting Coordination

AWI central staff scheduled multiple AWI meetings, including weekly coordination meetings, several Executive Committee meetings and business manager meetings, and all-staff and External Advisory Committee meetings twice a year. External Advisory Committee meetings were held in January and October of 2008. Central office staff, assisted by Jina Olbinski at ASU also supported all of the workshops, some of which were multiple-days with very complex arrangements.

C. Campus Coordinators

All three coordinators maintained campus list-serves and held meetings to facilitate communication with faculty and students and promote generation of project ideas and funding opportunities as well as efficient management of projects.

- Anna Spitz (UA) was the project manager for multiple AWI projects, assisted with the newsletter and with tracking funding for projects. She worked on several letters of intent for grant applications and managed the UA intern and faculty incentive programs.
- The AWI office at ASU has been located at the Global Institute of Sustainability; Jim Holway continued as the campus coordinator for ASU. Linda Williams very ably covered the ASU business activities including supporting the two AD's and several complicated contracts. Jim received support for most of the past year from Jina Olbinski.
- NAU has an AWI office that is supported by Melody Bowling and Kimberly Everidge, with Abe Springer and Paul Gremillion serving as co-coordinators. NAU has been exceptionally supportive of all AWI activities and very engaged in our work and sees a future for some water coordination activities after AWI ceases operations.

D. Associate Directors

There are now only two Associate Directors (AD), as Bennett Curry left his position as AD for Commerce in December of 2007. Chuck Graf has been in his position for two and a half years, and Placido dos Santos for about two years and a quarter.

- Chuck has been doing a yeoman's job as manager of most of our water quality projects, liaison for ADEQ, and coordinator of the salinity workshop. He is on numerous advisory boards and reviews proposals for many other organizations. He regularly helps coordinate conferences and workshops and has been assisting in fundraising and grant writing.
- Placido is the AD for ADWR, and has worked hard to engage ADWR in AWI activities. He initiated a new Water Table for the Arizona Mexico Commission at ADWR's request and is now the lead Arizona coordinator for the Arizona-Sonora Bi-national Institute for Water and Renewable Energy. He coordinated and led a very successful bilingual field trip co-sponsored by AWI to the lower Colorado and Delta area and has developed the US-Mexico training program funded by Christy Walton. He is managing several AWI projects. He also participates in reviewing research proposals for outside entities and has been invited to Washington DC twice in the last year to provide input to EPA. He has also participated in multiple bi-national conferences.

E. Other

We spent much time this year unsuccessfully trying to reach a comprehensive agreement about the IDC rate for AWI projects and developing a unified and simplified joint contracting process across the universities.

VI. Funding and Fundraising

- This year, the Board of Regents provided $100,000 to support central office activities.
- The Arizona Legislature provided $1.08 million to support AWI activities on the three campuses for FY 2008-2009. Due to the budget cut in 2008, we were operating at 10% lower levels (and now are in shut-down mode, so roughly half this amount will be returned on each campus).

- Our fundraising activities were curtailed this year due to administrative issues in our office. We did receive checks from APS, City of Phoenix, Salt River Project, Global Water, and Tucson Electric/Unisource, the City of Scottsdale, AWPCA and the National Water Research Institute. The donations received in 2008–2009 totaled $89,050.
- Over the past three years, we have received support from several sources at the UA to support AHIS, including a 2007 TRIF grant of $100,000 through SAHRA to support a programmer and the new informatics position, $75,000 to support the new informatics position through IE, and $45,000 from Biosphere 2 for the informatics position, derived from a Science Foundation Arizona grant. Funding at ASU for one grad student came from the Decision Center for a Desert City and a $150,000 grant came from the Arizona Community Foundation.
- Although we have not finalized the agreement yet with Reclamation, they are currently processing a $457,332 renewal on our "Enhancing Water Supply Reliability on the Colorado River" grant. The contract for this renewal has been in negotiation for 9 months.
- Two NSF grants submitted during 2007 were turned down but received generally positive reviews. They will be modified for resubmission by Matthew Garcia during 2009–2010.
- AWI has also obtained significant research funding for our projects from outside collaborators.
- We requested earmark funding for the Casa Grande Water Recycling Project through the Energy and Water Development and Related Agencies Appropriations Act of 2009, and were awarded $54,000 via the Inland Waterways Trust Fund. This funding is to support water recycling technology evaluation and development for the 100% recycling at the Frito Lay Casa Grande Plant.
- Total funded activity for AWI since its inception, including direct funding, cash matching, and in-kind contributions, was $4.2 million. The total cash flow to the three universities from the Arizona legislature and the Arizona Board of Regents was $4.43 million.

2008 AWI Funded Project Summary (2/20/08)

2008 Project	Non-University Partners**	Expected Outcomes	Status	Benefits to Arizona's Citizens
1. Enhancing Sustainable Water Reclamation Using Algae-Based Biotechnology Investigators (Principal Invest. in bold): **Baxter** (NAU); Hu, Sommerfield (ASU)	Phoenix	Perform research to integrate algae-based biotechnology into sewage treatment processes for bioenergy production, carbon dioxide sequestration, and dissolved solids reduction.	Selected for Funding	Promotes enhanced energy production potential of sewage treatment plants, reduced energy use and carbon footprint, and improved quality of treated wastewater available for beneficial reuse.
2. Evaluating Proposed Operational Practices for Control of Naegleria fowleri in AZ's Public Drinking Water Systems PI: **Brown**, Rittmann, Abbaszadegan (ASU); Gerba (UA)	Peoria, Tucson, Mesa, Chandler	Evaluate operational practices in public drinking water systems to ensure that the deadly amoeba, *Naegleria fowleri* , if present in the source water, is controlled and will not pose a threat to human health.	Selected for Funding	Protection of drinking water supplied by public drinking water systems.
3. Reverse Osmosis Pretreatment Using Ion Exchange Brine Recycle and Selective Precipitation PI: **Ela**, Arnold (UA); Ketterer (NAU)		Characterization of a novel pretreatment approach that could greatly increase the effectiveness and reduce brine wastewater volumes in the RO treatment of CAP water.	Selected for Funding	Enhance the feasibility of large-scale treatment of CAP water to augment the water supply in Tucson and elsewhere.
4. Arizona's Agricultural Economy - Future Scenarios and Water Management Implications PI: **Frisvold** (UA); Aggarwal, Patterson, Acharya, Molina (ASU)	Agri-Business Council of Arizona	Hold six listening sessions with key agricultural stakeholders to determine their vision for the future of agriculture in AZ. Based on this input, develop 3-5 future scenarios for agriculture and evaluate their water management implications, both medium-term (to 2020) and long-term (2020-2050).	Selected for Funding	This project analyzes future scenarios for agriculture as a first step to allow policy makers to consider water needs in Arizona, to avoid unintended disruptions to agricultural economies and rural communities and to evaluate different criteria for any potential water transfers.
5. On-Site Microbial Monitoring of Water by Electrokinetic Lab-On-A-Chip PI: **Islam**, Porter (NAU); Chae (ASU)		This project combines in a unique way two emerging technologies (microfluidics and microcantilever sensors) that could lead to the development of real-time instruments for detecting and quantifying dangerous chemicals and pathogenic organisms.	Selected for Funding	Technologies for real-time detection of dangerous chemicals and pathogenic organisms are critically needed in the drinking water and wastewater treatment industries and for homeland security purposes. This project has very high commercialization potential.
6. Impacts of Forest Thinning on Water Balance PI: **Kolb**, Montes-Helu, Flikkema (NAU); Breshears (UA)	NSF, USDA	Builds on ongoing work by evaluating new concepts for modeling evapotranspiration (ET) in ponderosa pine forests undergoing thinning. A new approach using wireless, compact, distributed data-logging sensors will be used to provide ET data.	Selected for Funding	Thinning is often promoted to reduce forest fire hazard and increase surface water yield in ponderosa pine forests. ET is a key factor in estimating runoff and water yield for thinned plots. This project will help evaluate the water and related benefits of forest thinning.

7. Arizona Hydrological Information Portal - A Collaborative Web Environment for the AHIS PI: **Otte** (NAU); **Gries**, Aguilar (ASU); McGill (UA); Abraham (Klienfelder)	Kleinfelder	This project will integrate recently completed components of the Arizona Hydrological Information System (AHIS) into a single user-accessible and user-friendly Web portal through which users will be able to easily and efficiently manage and share data.	Selected for Funding	The Web portal will allow state agencies, researchers, private industry, and the general public easy Internet access to a wealth of cross-agency water data in AZ and aids AHIS in becoming the electronic clearinghouse for user-friendly access to water data in Arizona.
8. Status of Generation, Reuse and Recharge of Treated Wastewater in AZ: Evaluation of Programs, Data Sources and Utilization Opportunities PI: **Rock**, Uhlman, Eden, Westfall (UA); Fox, Stromberg, White (ASU); Solop, Newell (NAU)	ADEQ, ADWR, USBR	Identify and compile data on reclaimed water and its reuse/recharge from ADWR, ADEQ, and other sources. Based on the data compilation, the current status of reuse/recharge and state regulatory programs governing those activities will be evaluated, and further opportunities for more widespread and efficient reuse will be identified.	Selected for Funding	Project will provide a better understanding of the extent of reuse/recharge in Arizona, how this source of water compares to other sources of supply (groundwater, surface water, CAP water), and opportunities for promoting additional utilization.
9. Water and Energy Sustainability with Rapid Growth in the Arizona-Sonora Border Region PI: **Scott**, Varady, Garfin (UA); Pasqualetti, Guhathakurta (ASU)		This project will 1) map spatial patterns of population growth and economic drivers in the rapidly growing Arizona-Mexico border region, 2) quantify current and future energy and water requirements, 3) assess future energy and water sustainability including impact of climate change, and 4) evaluate alternative management scenarios.	Selected for Funding	Water and energy demands are inextricably linked at the Mexican border and need to be evaluated from a combined management perspective. Information on projected energy or water shortfalls identified in this study will assist Arizona and Sonora in developing sustainable energy/water strategies.
10. Sensitivity Analysis of Arizona State Drought Status Determination *PI: **Selover** (ASU); Crimmins, Garfin (UA); Craig (ADWR)	ADWR	Drought status in AZ is currently determined using set of subjective weighting factors for various drought indicators (e.g., rainfall and streamflow). This project will analyze the drought indicators and weighting factors , develop optimal calculation methodologies and weightings, and test against historical records for prediction accuracy.	Selected for Funding	Portrayal of drought status to affected parties, government officials, and the general public needs to be as accurate as possible. This project will provide a better scientific basis for determining drought status in Arizona, which in turn will allow more appropriate and effective drought mitigation strategies to be implemented.
11. Verde River Ecological Flows Study Phase II: Integrated Research for Refining Flow-Ecology Response Models PI: **Stromberg**, Schmeekle (ASU); Springer (NAU); Meixner, Reinthal (UA)	The Nature Conservancy	One of the products of the first phase of this study (2007 AWI Project #4) was a consensus research agenda for determining the ecological response to hydrologic variation in the Verde River. This 2008 study begins implementing the research agenda, including integrated data collection (floodplain characteristics, riparian vegetation, fish and fish habitat-flow relationships, groundwater levels, etc.) and further development of the flow-ecology response model.	Selected for Funding	In the upper Verde River, increased groundwater pumping will cause conflicts between human and ecosystem needs due to resulting flow decreases to the river. The aim of this project is to better define the water requirements needed to maintain the ecologic characteristics of the Verde River system (fish, riparian plants, etc.). The information gained is essential to devise approaches to sustain the Verde River ecosystem as water demand grows.

12. Hydroclimate Management Capacity Building and Watershed-Based Precipitation Runoff Modeling in the Navajo Nation PI: **Tecle**, Anderson, Cobb, Heinrich (NAU); Garfin, Crimmins (UA); Leeper, Tallsalt-Robertson (Navajo Nation)	Navajo Nation Dept of Water Resources	This project follows up on findings of a 2007 AWI-funded project (#5) on the Navajo Nation by 1) developing manpower and building capacity in hydroclimatic science and instrumentation management and 2) modeling watershed-scale rain–runoff relationships.	Selected for Funding	This project will help the Navajo Nation acquire reliable information on water yield and stream flood flows for economic development, flood and drought forecasting and management, and hydraulic structural design and ecosystem maintenance. All of this information will help provide a better quality of life in tribal communities.
13. Operation of the Activated Sludge Process for Removal of Estrogenic Activity During Conventional Wastewater Treatment PI: **Quanrud**, Saez (UA); Propper, Vail, Ingram (NAU)		Continues research from a 2007 AWI-funded project (#6) by using bench-scale methods to determine the effectiveness of specific unit sewage treatment processes to remove endocrine disrupting chemicals (EDCs) from treated wastewater. The project also supports continued development of a rapid immuno-based sensor to detect key estrogenic compounds.	Selected for Funding	Promotes safe and effective reuse of reclaimed water in Arizona by identifying the specific sewage treatment plant processes and operational methods that will most effectively remove EDCs from treated wastewater. The sensor, which has great commercialization potential, will make analysis of key estrogenic compounds simpler, faster, and cheaper.
14. A Best Practices Guide for Rural Water/Energy Usage in Arizona PI: **S. Mead**, Schlinger, Auberle, J. Mead (NAU); Casavant (UA); Sejkora (AZ State Parks)	Az State Parks	Develop a best practices guide for rural communities to conserve water, reduce energy usage, and minimize greenhouse gas emissions in the management and operation of their water and wastewater infrastructure.	Selected for Funding	Rural communities operating water treatment/distribution and wastewater collection/treatment systems generally do not have the personnel and expertise to help them "green" their infrastructure. The best practices guide from this project will fill that gap and benefit the communities from both economic and environmental standpoints.
15. Developing a Methodology for Identifying and Prioritizing At-Risk Water Resources for the Coconino Plateau PI: **Springer**, Stevens, Manone (NAU); Hogan (UA)		The project will (1) convene a workshop of experts in scientific, cultural, historical, and water law fields to identify Coconino Plateau's most important hydrologic features, (2) compile existing information about "at-risk" water resources at these sites, (3) conduct site visits to fill in basic data gaps, and (4) develop a prioritization scheme and prioritize areas.	Selected for Funding	By identifying at-risk water sources on the Colorado Plateau, an opportunity exists to prioritize these sources for management and protection as needed. The methodology will be published and disseminated for use by other watershed groups throughout Arizona to ensure that at-risk water are properly identified and prioritized.

**Public and private investment:* AWI grant amount [left column]; partner cash and in-kind contributions by universities (non-AWI), public agencies, non-governmental organizations and private sector entities [middle column]; and total investment [right column]

***Non-university public or private partners contributing cash or in-kind services to the project. (AWI appreciates substantial cash and in-kind service contributions by one or more of the universities for many of the projects, but has not separately listed those university partners in this column)

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

Emerging Issues

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 425,959 [1]	$ 425,959	$ 131,405
TRIF Revenue	575,000	490,912	719,180
TOTAL REVENUE	**$ 1,000,959**	**$ 916,871**	**$ 850,585**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	**-**	**-**	**-**
GRANTS/PROJECTS:			
Beat the Odds Institute (CFA)	250,000	250,000	-
Arizona Academic Scholars Program (ABEC)	75,000	75,000	-
Health Research Alliance Arizona CTSA (UA) [3]	500,000	500,000	500,000 [2]
Algebra II Assessment Pilot	15,000	15,000	15,000
Projects to be determined:	160,959	-	210,585
Consulting services relating to *2020 Vision* strategic plan	-	35,240	-
Consulting services relating to federal stimulus funds	-	33,253	60,000
Advancing Arizona through a Web-based Initiative (CFA)	-	-	65,000
Subtotal Grants/Projects	**1,000,959**	**908,493**	**850,585**
EXPENDITURES GRAND TOTAL	**$ 1,000,959**	**$ 908,493**	**$ 850,585**

[1] Pursuant to ABOR direction in June 2008, $175,000 of Arizona Regents Reach Out (ARRO) funds were transferred into the Regents Innovation Fund to address emerging issues in FY 2009.

[2] This $500,000 of FY 2010 funding is pending ABOR approval in September 2009.

[3] HRAA CTSA funds were allocated to UA in FY 2008 and FY 2009 and are included in UA's reports. The amounts here are for informational purposes only and are not carried forward to the Regents Innovation Fund Summary page or to the Central Office Grand Summary page.

ARIZONA BUSINESS AND EDUCATION COALITION (ABEC)

ARIZONA ACADEMIC SCHOLARS INITIATIVE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FINAL REPORT

August, 2009

Prepared by
Susan Carlson, Executive Director, ABEC
Bobbie Cassano, Academic Scholars Director

ARIZONA BUSINESS AND EDUCATION COALITION (ABEC)
ARIZONA ACADEMIC SCHOLARS INITIATIVE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2009 ACTUAL

FY2009 INITIATIVE OVERVIEW

The goal of the Arizona Academic Scholars Initiative is to build community-based partnerships around the goal of preparing our high school graduates for both careers and postsecondary training and education. The Arizona Business & Education Coalition (ABEC) just completed the third year of three-year funding from the Arizona Board of Regents TRIF grant to support the Arizona Academic Scholars Initiative. The focus of activity for FY 2009 was to expand the Initiative beyond the current 16 school districts and their communities and to prepare for the sustainability of the partnerships as the ABOR grant money comes to an end.

In May 2007, the State Board of Education (SBE) passed a resolution to "support the Arizona Scholars Initiative as a means of encouraging students to engage in a rigorous course of study so that they are adequately prepared for work and post-secondary education in the 21st century". In December 2007, the SBE approved increased high school graduation requirements effective in 2012 and 2013. These graduation requirements include increased math and science credits. The Scholars course of study is seen as an interim step toward the implementation of these more rigorous graduation requirements statewide.

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 downturn in the state and national economy was not anticipated at the time of the annual Initiative planning and, as might be expected, played a part in the outcome of the Initiative results. This economic influence was perhaps best seen in lower than anticipated new districts adopting Arizona Academic Scholars and, in part, may be responsible for less business activity surrounding Scholars' presentations and on-going support.

FY2009 GOALS / OBJECTIVES

1. Continue to expand the Arizona Academic Scholars Initiative beyond the 16 current districts.

2. Increase the number of high school students successfully completing an academically rigorous curriculum.

3. Continue to increase the number of $8^{th}/9^{th}$ grade students introduced to the Arizona Academic Scholars initiative and encourage them to take the Scholars course of study.

4. Complete the update of Scholars materials so it is easy to access, appealing to each audience and is current. Updating the Scholars website is part of this process.

5. Encourage districts to include their business partners in carrying out the Scholars initiative and to achieve greater support of all types.

FY2009 PERFORMANCE MEASURES / DELIVERABLES

		FY2009 ACTUAL
1	Increase the number of Arizona Academic Scholars district statewide	• Multiple presentations were given to Superintendents, key educators, School Boards and business organizations including several meetings in Cochise County involving the community college and the school districts and business organizations in both large and smaller group settings. • Three new Scholars districts were added, bringing the total number to 19 participating districts statewide.
2	Increase the number of high school students graduating as Arizona State Scholars	• Approximately 900 more Scholars medallions were ordered in 2009 as compared to 2008 for seniors graduating as Arizona Academic Scholars. These figures do not include Mesa Public Schools (have chosen not to use medallions) or Gilbert Public Schools (chose not to recognize seniors this year because they were just starting to implement Scholars). • District final reports indicate a total of approximately 5500 students in the 19 districts graduated as Arizona Academic Scholars.
3	Increase number of 8th / 9th graders receiving presentations regarding the Scholars course of study	• Approximately 826 Scholars presentations were given to 8th/9th grade students in the 19 districts. • An estimated total of just under 27,000 students received this Scholars' information statewide.

FY2009 RESULTS, ACCOMPLISHMENTS, AND LESSONS LEARNED

1. Three new districts and their business partners signed letters of commitment to become Arizona State Scholar partnerships in the year, bringing the total to 19 participating active Scholar districts.

2. In conjunction with representatives from ADE, ABOR, administrators, school counselors and ABEC, the Scholars course of study was revised for students graduating in 2013 and after. This revision reflects an increase in rigor greater than will be required by the state for high school graduation, and is primarily seen in the areas of math and science.

3. To go along with the new marketing materials developed in the previous year and to achieve optimum ease of use and outreach statewide, the Arizona Academic Scholars website was updated for content and appeal. The website, http://www.azacademicscholars.org is easy to use and includes an overview plus messaging targeted to the four audiences of students, parents, educators and business. Each of the target audience brochures is available on the website along with the Scholars course of study, next steps and contact information. A student and counselor testimonial along with interesting facts and figures are scattered throughout the site.

4. Each district Superintendent was asked to identify a district coordinator for the Scholars program. Both the coordinator and the Superintendent were advised of their responsibility to complete a simple final report at year-end in order to more accurately track the success and measurable outcomes of each district. A summary of this report is attached at the end of this report. In order to compensate for the time required for this additional work, a one

thousand dollar ($1000.00) stipend was offered to the district coordinator (if approved by their Superintendent). A total of 12 coordinators received this stipend and they all understand it will not be available in future years.

5. The number of medallions ordered by the districts to recognize seniors graduating as Arizona Academic Scholars increased by almost 900 from the prior year. Mesa Public Schools and Gilbert Public Schools did not present medallions as a form of recognition to their graduating Scholars Seniors.

6. The cost of medallions was covered through the ABOR grant and for Pima County, through a UnitedHealthcare grant. Each district Superintendent and Coordinator has been advised that this funding will not be available in future years, requiring the need for school districts to plan for this expense accordingly. The hope is districts will work with their business partners to help consider ways to support this cost. It has been shown through student and coordinator response that the medallions are a powerful incentive for students to remain on the Scholars course of study.

7. According to the final reports from each district, the total number of seniors graduating as Arizona Academic Scholars in 2009 is estimated to be 5595 statewide (excluding Gilbert Public Schools). This represents 31% of the total number of anticipated seniors graduating from these districts statewide.

8. Approximately 26,691 students primarily in 8th/9th grade received the Arizona Academic Scholars presentation. Though Arizona Academic Scholars is directed to the middle fifty percent (50%) student, it is open to all students with the belief that all students need to better understand the realities of the global economy in the 21st century.

9. It may be accurate to assume several districts and business organizations which had shown interest in adopting the Arizona Academic Scholars initiative may have determined not to move forward due to the economy and doubt as to the time and expense such an initiative might require.

10. Early in the year, the Scholars Initiative was undertaken by a group of three “feeder” districts (two elementary and one high school), but they later determined they were not ready to move forward. In this case, we strongly suspect that had these districts been unified, rather than independent, this may not have been the ultimate outcome. This does point out some of the difficulty in working vertically within districts that may not have the political structure of a unified district.

11. Though each Scholars partnership includes at least one business or business organization which has committed to the initiative, the reality is educators are often hesitant to invite these business leaders in to give the presentations to their 8th/9th graders. This may be due in part to time constraints, but allowing business partners to participate more personally in presentations, mentoring or other “hands-on” activities appears to be problematic.

12. One of this year’s new districts, Gilbert Public Schools, devised a very ingenious way in which to educate their middle and high school students about the Arizona Academic Scholars. They created a short video which was shown at least two times via video announcements to all 7th and 8th graders in their seven junior high schools (approximately 3200 students) and in all four of their high schools (approximately 3000 additional students). In addition, all parents of these students were emailed an invitation to attend one of three informational meetings (18,000 emails sent with approximately an 80% delivery rate). As a

result, approximately 200 parents and 100 students attended one of these presentations. This certainly demonstrates the use of technology and creativity in devising new ways to educate and motive students and parents about the issue of rigor and academic success and its relationship to future success in the workplace.

CONCLUSION

It is evident that three years of ABOR funding through the TRIF grant has had enormous impact on the entire state of Arizona. The Arizona Business & Education Coalition was successful in identifying Arizona as being ready and able to participate in the first group of states to receive federal funding for the State Scholars Initiative. However, this funding and support would not have been adequate to sustain a statewide initiative had it not been for the solid support and financial commitment of the TRIF grant. Though the business and education community could identify the need for such partnerships, sustainability and long-term efforts take time to develop.

The Arizona Academic Scholars Initiative raised the awareness of the need for additional academic rigor in our schools. With the support and encouragement of ABEC and the Scholars Initiative, the State Board of Education made the commitment to increase the high school graduation requirements for Arizona students starting in 2012 and 2013. In order for our students to be more successful in post-secondary education, reduce the amount of remediation taking place in our colleges and universities, and to keep our Arizona economy strong and vibrant and maintain a qualified workforce, it is imperative we demand the rigor necessary for 21st century success. The TRIF grant funding has allowed the Arizona Academic Scholars to be a key factor in moving Arizona ahead.

PROPOSAL FOR REMAINING TRIF FUNDS

The Arizona Business & Education Coalition (ABEC) has received a three year Arizona Board of Regents TRIF grant for support of the Arizona Academic Scholars Initiative. This grant was due to end on June 30, 2009. At the close of the grant period, there is a remaining balance of approximately $58,000. ABEC requests that these remaining funds be carried over until no later than June 30, 2010 in order to most effectively assure the intent and purpose of the initiative can be sustained.

BACKGROUND

The goal of the Arizona Academic Scholars Initiative has always been to encourage high school students, particularly the middle 50%, to take a rigorous course of study to more adequately prepare for success in both post-secondary education and future careers. A large measure of the Initiative's success can now be seen in the adoption of increased high school graduation requirements for Arizona which take effect in 2012 and 2013. In May 2007, the State Board of Education passed a resolution to "support the Arizona Scholars Initiative as a means of encouraging students to engage in a rigorous course of study so that they are adequately prepared for work and post-secondary education in the 21st Century". As a result, the Scholars course of study is viewed as an interim step toward the implementation of these more rigorous graduation requirements which include an increase in the number of math and science credits.

USE OF REMAINING FUNDS

ABEC believes that by using the estimated remaining funds of approximately $58,000, we can positively transition the Arizona Academic Scholars Initiative into a business-education partnership model foundational to the ECAP (Education and Career Action Plan) process under development now by the Arizona Department of Education. The model would be highlighted

and included within ABEC's Best Practices in Business-Education Partnerships resources. Local business partners will continue to deliver the Scholars message of **"more academic rigor and university preparedness"** to middle school students prior to them creating their ECAP. This includes encouraging students to take more math and science and thus improving the pipeline into postsecondary education.

GOALS OF THE PROJECT

The goals of the project are:

1. To increase the number of middle school students introduced to the Scholars message encouraging them to commit to a more rigorous course of study as well as being able to understand the relevancy of more academic rigor.
2. Provide the training and tools for business partners to effectively deliver the message of rigor and postsecondary and career readiness to middle school students.
3. To expand the existing Scholars website (www.azacademicscholars.org) as a tool for career exploration and connect it to the resources for the ECAP. This interactive and technically advanced site might include:
    a. Resources for school districts wanting to launch local Arizona Academic Scholars Initiatives;
    b. Resources for students to explore careers and complete their high school ECAP;
    c. Links to post-secondary opportunities and information throughout the state;
    d. Resources and links for educators seeking intervention strategies;
    e. Resources for parents to support student success; and
    f. Resources for businesses seeking effective business-education partnership opportunities.
4. To create strong business and education partnerships that promote academic rigor.

SUMMARY

The use of the remaining funds would enable the hiring of a project manager, cover the cost of materials and training, and further develop the Scholars website. This work may also attract federal stimulus funds to the project, thus increasing the likelihood of sustainability. In any case, it will serve as a model business-education partnership with emphasis on student academic rigor, business input and participation, and improving the pipeline for postsecondary and career preparedness.

Arizona Academic Scholars

Statewide Summary

2009

Total number Scholar District/Community Partnerships: Amphitheater Apache Junction Bisbee Chandler Flagstaff Flowing Wells Gilbert Higley Marana Mesa Payson Peoria Sahuarita San Manuel Snowflake Sunnyside Tanque Verde Tucson Vail	**19**
Total number of new district Scholar partnerships this year	**3**
Total number 8th/9th grade Scholar presentations given	**826**
Total number 8th/9th grade students receiving Scholar presentations	**26,691**
Total number Scholars presentations given by educators	**809**
Total number Scholars presentations given by business / community members	**31**
% of 8th/9th grade Scholar presentations given by business / community members	**3.8%**
Number of Scholar districts using business partners	**12**
Total number of graduating seniors in Scholar districts*	**17,976**
Total number of graduating seniors identified as Arizona Academic Scholars*	**5595**
% of seniors graduating as Scholars in Scholar districts*	**31%**
Approximate % of minority students graduating as Scholars	**31.6%**
Number of Scholar districts reporting this figure	**14**

excludes Gilbert

FY2009 Budget & Actuals

	FY 2007 ACTUAL	FY 2008 BUDGET	FY 2008 ACTUAL	FY 2009 BUDGET	FY 2009 ACTUAL
REVENUE					
Carry over from prior year		71,484		57,542	
TRIF Grant	75,000	75,000		75,000	
TOTAL REVENUE	**$75,000**	**$146,484**	**$146,484**	**$132,542**	**$132,542**
EXPENDITURES					
SALARY					
Project Manager					
Support Staff		5,000	5,289	7,000	
OPERATING					
Grant Administration Fee					17211
Meeting Expenses			34	300	
Postage & Delivery	22	1,500	32	300	49
Printing & Reproduction	12	1,500	1,988	2,500	2687
Scholar Recognition		14,000	11,413	18,000	16231
Stipends		15,000	10,000	15,000	12000
Supplies	20	1,000	206	800	55
TRAVEL					
Airfare	507	2,500		1,500	
Auto/Mileage	237	2,500	728	2,500	932
Event Registration		2,000	125	800	
Lodging		2,500	118	800	121
Meals		1,500	76	800	19
CONTRACTUAL					
Accounting					
Intern(s)		8,000		500	
Marketing/Communications		12,000	20,576	25,300	2768
State Program Director	2,625	30,000	37,941	45,000	19468
Temp Services	83	1,000	416	500	
Web Services & Support	10	1,000		2,500	250
Web/Graphic Design		15,000		7,942	2235
Other Contracted Services		3,000		500	
TOTAL EXPENDITURES	**$3,516**	**$119,000**	**$88,942**	**$132,542**	**$74,026**

FY 2009 Budget Narrative:

Scholar Recognition: Includes medallions for seniors graduating as Scholars.

Stipends: Provides $1,000 to each participating school district's primary coordinator if approved by district superintendent.

FY 2009 Actuals Narrative:

Estimated balance after remaining June expenses **$58,000**

FY2010 Budget

	FY 2010 BUDGET
REVENUE	
TRIF Carry over from prior year	$58,000
Grants	
Sponsorships	
TOTAL REVENUE	**$58,000**
EXPENDITURES	
OPERATING	
Grant Administration Fee	
Meeting Expenses	300
Postage & Delivery	50
Printing & Reproduction	3,000
Supplies	100
TRAVEL	
Airfare	
Auto/Mileage	2,000
Event Registration	
Lodging	
Meals	
CONTRACTUAL	
Marketing/Communications	7,350
State Program Director	35,000
Web Services & Support	200
Web/Graphic Design	10,000
TOTAL EXPENDITURES	**$58,000**

IDEAS AT WORK

CENTER FOR THE FUTURE OF ARIZONA

DEDICATED TO IMPROVING THE QUALITY OF LIFE FOR ALL ARIZONANS

AUG 2009

Dr. Lattie F. Coor
Chairman and CEO

Dr. Sybil Francis
Executive Director

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

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Beat the Odds Website Initiative FY 2009 Annual Report

The Center for the Future of Arizona was created to improve the quality of life for all Arizonans. As a "do tank" emphasizing action and results, the Center keeps important issues in public view by providing focused attention and thoughtful action on pressing problems. One of the most important issues of our time is access to high quality education for all Arizonans. The Beat the Odds project is an example of the Center's "do tank" role and an early indicator of its intention to use electronic communication tools for collaborative, thoughtful action to improve education in Arizona.

The Center's 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

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 to further disseminate the study and implement its findings at the school and district level. In so doing, the Institute is mobilizing Arizona around a new goal – significantly improving "achievement per student" in all schools.

The central thrust of the BTO Institute is the BTO School Partners Program, described below, and a key to the success of both is the online resource center—the sophisticated, highly interactive website funded by the Arizona Board of Regents Technology and Research Initiative Fund (TRIF) Regents Innovation Fund. The resource center provides online tools for users to assess their leadership skills and develop practical plans for incorporating BTO concepts into their schools. To participants in the School Partners Program, the resource center offers a forum for online discussion and dialogue and provides access to new research, directories and links to other organizations actively engaged in education reform including the state universities. Significant progress in developing and expanding the Partners Program and enhancing the website has been made in FY 2009, the third year of TRIF funding.

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Performance Analysis

Enhancement of Online Resource Center/Website

Phase 1 of the Beat the Odds website was completed in 2008. Phase 2, which was completed in 2009, included construction of functions to track policy/legislation as well as the further development of the site to adapt it to the needs of the Partners through the continued refinement and customization of tools and resources. During FY 2009, the student program to support the ongoing research content of the website was initiated with additional development planned for 2010. Also under development, is the addition of e-commerce capability to support the addition of significant training and implementation tools, including a BTO Handbook which was completed in 2009 and is available now in a pilot version. Visit http://www.beattheoddsinstitute.org to view the site.

Partnerships

The Beat the Odds Website Initiative has been a powerful catalyst in building a network of partnerships.

- **Schools – The Beat the Odds Partners Program**

  The BTO Institute provides services through the School Partners Program. During FY 2008, the first year of the program, Beat the Odds provided training, assistance and support to principals in 27 schools located in 18 districts. During the FY 2009, with support from TRIF funding, BTO provided these services to 59 schools, more than double the number that received help the previous year. Through the program, experienced principals act as mentors to the partner principals and both participate in monthly leadership training seminars on key aspects of the BTO principles, receiving and sharing practical advice on topics such as data analysis and ongoing assessment, collaboration, high stakes testing and parent empowerment. The success of the program to date has led us to add 26 new schools for the coming school year, increasing the number of participating schools to a total of approximately 85 located in Phoenix, Tucson, and Whiteriver, Arizona. Each cohort is expected to continue for three years as participants work toward designation as a Beat the Odds School as measured by improvements in performance similar to the successful schools cited in the original study.

  Partners interact with each other and with their mentors through the TRIF-funded website that serves as the online resource center for the project. The BTO Institute website is the communications infrastructure for the BTO Partners Program. Its password protected "Partners Only" section enables networking among the BTO Partners and supports peer mentoring and coaching, ongoing training, sharing of best practices and access to secure discussion boards, event calendars and content tailored to the needs of the BTO Partners. In FY 2009, technology on the website was expanded so that during the 2009-2010 school year, each Partner will complete a customized school self-evaluation survey, receive an on-demand graph analysis of survey results and develop an action plan that will include an electronic tracking system. At a later date, case studies, web-based conferencing and other functions required by users will be added.

  Other Arizona schools are working to implement study findings on their own and are encouraged to use the website as a valuable resource. A BTO Handbook to support schools in this implementation has been completed and has been distributed to Partners in a pilot version.

The resource center also has public areas that include the Beat the Odds report with a Spanish translation of key segments, as well as information about the project and BTO Partner schools. "Ideas at Work," a TRIF-funded instructional DVD about the Beat the Odds study and findings, was developed and is available on the website for use in seminars and other educational activities. During FY 2009 additional videos and news clips have been added to the Partners community portion of the website making them available for training teachers and other staff members at the schools.

- **Organizational Partners**
  Numerous organizations are 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 and development 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 website provides links to all partner organizations.

- **Funding**
  The $250K annual TRIF funds have enabled us to leverage other support for the BTO project at a rate of nearly 3:1. Funding partners include the Arizona Community Foundation ($100K), Stardust Foundation ($150K), the Salt River Pima Indian Community ($450K), the University of Phoenix ($500K over 3 years) and the Helios Foundation ($66K) as well as a major gift from Rusty and Rosie Lyon ($100K).

Collateral Activities

- As implementation of the TRIF project has proceeded, the Center has continued to actively disseminate the BTO findings. For example, in July the Beat the Odds keys to success and their application in the schools were featured on "Horizonte," on Channel 8. In August, the Institute presented BTO principles and described the School Partners program to representatives from education agencies across the state at a meeting of AZLeads/Leaders for Learning and, in October, to representatives of 18 school districts at the Greater Phoenix Education Management Council. Also, in October, a keynote presentation and follow-up session on BTO were part of the Arizona Schools Administrators' Fall Superintendency/High Ed Conference. Subsequent presentations were made to principals at an event sponsored by Teach for America, to members of the Southern Arizona Leadership Council in Tucson, to superintendents' groups from Phoenix and Tucson and to Yuma County's schools administrators and teachers at their annual Professional Development Day. Throughout the year, BTO was introduced and discussed through personal visits to more than 20 superintendents and district administrators in Phoenix and Tucson. In the spring, Channel 12 featured data-driven instruction at Gilliland Elementary, a BTO Partner school in Tempe.

- A comprehensive assessment and evaluation program has been developed and is in use for all activities related to Beat the Odds, including the website.

- Mentors, partners in BTO and their schools received special recognition in 2009. Two principals, one a partner and one a mentor, were selected as Exemplary Principals by the Rodel Charitable Foundation; and a mentor and a partner were honored when their schools were designated A+ as part of the Arizona Education Foundation's Blue Ribbon competition. Two BTO mentors earned promotions from principal to assistant superintendent while another BTO mentor and two BTO principals moved to district office positions. Two schools

won Golden Bell Awards from the Arizona School Boards Association; two received neighborhood Block Watch Grants and one school, along with BTO and the Center, received the ICARECORPS Partnership Award.

Goals & Results

The mission of the Beat the Odds Institute and its online resource center is to improve "achievement per student" by working collaboratively with K-12, community college and university educators, and with policy makers and funders to embed BTO principles in Arizona's K-12 schools and beyond.

Our goal is to increase the performance of our target group of students in reading and math so their academic performance compares favorably with the achievement of higher socio-economic students. Recently completed analyses of AIMS reading and math scores for participants in 2007-2008 indicate that some Partners have already shown encouraging evidence of improvement. A number of schools showed year-to-year improvements in reading and math that were significantly larger than their district's improvement while 21% of schools showed a significantly larger improvement in AIMS math and reading scores compared to their previous year's change in scores. An analysis of 2008-2009 state test results is currently underway.

To become a "Beat the Odds School" requires three years of sustained growth in AIMS test score data, as well as full implementation of the six Beat the Odds elements. As part of a multi-year improvement program, schools have the opportunity to earn recognition at several levels. This year, 16 schools achieved "bronze" status for effectively implementing the key elements as measured by the survey on the BTO interactive website and their achievement of at least a label of "performing" on AZ Learns as determined by the Arizona Department of Education. Data on AZ Learns that becomes available this fall will be utilized in determining which schools have met the requirements for achieving "silver' status, the next level of improvement.

Financial Information

Fiscal year ending June 30, 2009

	FY 2007 Actual	FY 2008 Actual	FY 2009 Budget	FY 2009 Actual
REVENUE				
Carry Forward	$ 0	$69,850	$10,000	$10,000
New TRIF Revenue	$250,000	$250,000	$250,000	$250,000
TOTAL REVENUE	$250,000	$319,850	$260,000	$260,000
OPERATING BUDGET				
Personal Services	$75,695	$138,000	$150,000	$140,530
Outside Vendors	$97,520	$161,850	$62,000	$90,320
All Other Operating	$6,935	$10,000	$8,000	$775
Student Program			$40,000	$28,375
TOTAL EXPENDITURES	**$180,150**	**$309,850**	**$260,000**	**$260,000**

Indicative Results in FY 2009 (year 3)

1. RETURN ON INVESTMENT: Grants and gifts continued to leverage TRIF funds at the rate of 3:1 as funding was secured to expand the work of the Beat the Odds Institute in 2009. To further leverage TRIF funding, an agreement between the Center and the ASU School of Public Affairs provided two undergraduate students and one graduate student the opportunity to engage with the Center and the BTO Institute on the various projects highlighted in this report. The students made active use of the website and contributed to the development of materials that enhanced and expanded it. A School of Public Affairs faculty member served as a liaison between the students and the Center.

2. KNOWLEDGE TRANSFER: In addition to ongoing dissemination of the BTO study, 59 schools in Maricopa County signed formal agreements with the Institute to pursue designation as a Beat the Odds School, which requires schools to achieve performance criteria similar to those schools in the original study. That number will continue to grow in FY 2010 as the program implements additional expansion strategies in Maricopa County, the Tucson area and in Whiteriver.

3. WORKFORCE DEVELOPMENT: With support from the Regents Innovation Fund, the Center continued to focus on embedding key concepts from the Beat the Odds study in Arizona schools. By building on the knowledge gained, the Center expanded its impact more broadly on education reform by collaboratively exploring new pathways to post secondary education with K-12 schools, community colleges and our state universities. Another example is the Center's partnership with Greater Phoenix Leadership and its partner organizations statewide that provides ongoing opportunities to connect BTO and other Center activities to the efforts of the business sector to achieve the skilled workforce Arizona needs for the future. The Center's work to date in developing the Beat the Odds online resource center provides the opportunity to extend this capacity to other strategically important State initiatives, such as the creation of a common vision for Arizona—"The Arizona We Want".

4. EDUCATION OUTREACH: The BTO website currently averages about 16,205 hits per month, indicating the extent to which the site enables useful outreach and communication. In addition to the numerous partnerships that have been developed with schools, foundations, professional associations and organizations committed to educational success for Arizona, the Institute has developed a BTO instructional video available online and on DVD. Links to all the partner organizations also are available on the website. Additionally the original study is available online, as is a Spanish translation of the key findings of the report. As well, a Handbook for BTO implementation has been developed as an additional expansion strategy to enable broader use of the Beat the Odds concepts by schools and districts throughout Arizona, and will be piloted on the website. The Institute will continue pursuing both "top-down" and "bottom-up" strategies during FY 2010 to expand the network of BTO partnerships and to develop linkages to other important Center initiatives.

Management

Center for the Future of Arizona

Lattie F. Coor, Ph.D.
Chairman & CEO

Sybil Francis, Ph.D.
Executive Director

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Jack Pfister

HEALTH RESEARCH ALLIANCE ARIZONA (HRAA)
CLINICAL AND TRANSLATIONAL SCIENCE AWARD (CTSA) EFFORTS

Funds to Build the Infrastructure for a Successful Clinical and Translational Science Award

September 1, 2009

The statewide Health Research Alliance Arizona (HRAA) was created in 2007 in preparation for an application to the National Institutes of Health (NIH) for a Clinical and Translational Science Award (CTSA). The Principal Investigator (PI) was Keith Joiner, M.D., who was then Dean of the University of Arizona (UA) College of Medicine, and the initial application was submitted in November, 2007. HRAA Directors in this first submission included Robert Greenes, M.D., and Lawrence Mandarino, Ph.D., from Arizona State University (ASU), and Robert Trotter, Ph.D., from Northern Arizona University (NAU). The first submission was extremely ambitious and suggested that HRAA would bring together an extensive set of resources to be made available to a large number of partners. The implication was that much of this would be accomplished *de novo*.

Although not funded, the November 2007 HRAA application for a CTSA received a constructive review and a score in the mid-range of new applications in that cycle. One of the main concerns of the NIH reviewers was that the proposal was too grand to be manageable or realistically implementable. Major changes were clearly needed, and lengthy discussions with a wide range of experts and interested parties ensued. Those consulted included many HRAA stakeholders throughout the state, colleagues from funded CTSAs, and NIH staff. Through this deliberative process, the groundwork was laid for preparation of a second HRAA CTSA application in response to a new Request for Applications (RFA) issued by NIH in 2008.

The available funding announced in the 2008 RFA was reduced by approximately 30% from earlier CTSA funding cycles. In light of this new financial reality, a close reading of the reviewers' critiques of the first application, and detailed discussions with NIH Project Officers, it was decided that a complete reframing of our CTSA application would have to be undertaken. Under Dr. Joiner's continuing leadership, two major considerations framed the structure for the new HRAA CTSA application that was submitted on October 21, 2008. First, the statewide perspective was robustly maintained, including the same ASU and NAU Directors as for the November 2007 application. Second, clinical and translational research infrastructure was designed that would be broadly accessible to investigators throughout the state, regardless of institutional affiliation. A much tighter focus, consistent with the reduced maximum permissible budget of $4 million per year in direct costs, concentrated explicitly on leveraging the investments that had already been made, and on funds already awarded to Arizona researchers for collaborative clinical and translational research projects spanning disciplines, institutions, and sites. Despite significant redrafting, however, the October 2008 HRAA CTSA proposal received a score that was not in the fundable range.

In late May 2009, Dr. Joiner stepped down as PI for the CTSA and leader of HRAA. Close examination of the reviews of the second CTSA proposal and conversations with NIH staff revealed that the proposal still was seen to be too broad and unfocused, and lacking a clear leadership structure. It became clear to UA officials that, like all successful CTSAs, a CTSA in Arizona should be based in the clinical and translational strengths of an established college of medicine. New leadership for a successful CTSA application is being identified in the UA College of Medicine, and conversations are ongoing with the Directors from ASU and NAU in place since the last proposal submission. The challenges to be met and the resources that will be needed are sobering but are fully appreciated, and a vital new leadership structure is close to being defined. A radically restructured proposal for a CTSA based in the UA but with strong participation from ASU, NAU, and other relevant entities across the state is being planned.

In the meantime, TRIF support has enabled much progress in further developing infrastructure at UA, ASU, and NAU, which will be crucial for a successful CTSA application. This support is from two sources: (1) UA's TRIF budget to support the Arizona Clinical and Translational Research and Educational Consortium (ACTREC); and (2) the TRIF Regents Innovation Fund allocation to UA for HRAA projects at ASU and NAU.

1. UA Arizona Clinical and Translational Research and Educational Consortium (ACTREC)

Funding from UA's TRIF budget has made possible great strides in establishing the refurbished Clinical and Translational Science (CaTS) Clinical Research Unit (CRU) as the primary UA location for the conduct of experimental clinical research protocols requiring resources such as infusions, monitoring of vital signs, and administration of detailed questionnaires. Forty-eight protocols for research involving human subjects are currently open in CaTS. UA TRIF support for the salaries of nine staff and operating expenses has been largely responsible for the rapid growth of CaTS, which is now recognized across the UA campus as the home for experimental protocols involving human subjects. In addition to the CRU itself, during FY 2009 CaTS assumed administrative responsibility for a clinical research facility in the Herder Building on Speedway just east of Campbell Avenue.

The Herder facility includes a fully equipped sleep laboratory and, as an extension of CaTS, now houses prototypic equipment that was developed by Raytheon in collaboration with Arizona Cancer Center investigators for digitized evaluation of sun-damaged skin. This UA-Raytheon revolutionary approach to identifying and tracking the precursor lesions to skin cancer is supported by a large grant from Science Foundation Arizona.

HRAA UA created an Affiliated Community Health Center Network (ACHCN) for the purpose of CTSA-related community-based participatory research (CBPR). The participating organizations, all providing care for underserved populations, are: El Rio

Community Health Center (Tucson), Fort Defiance Indian Hospital (Navajo reservation), Mariposa Community Health Center (Nogales), Maricopa Integrated Health System (Phoenix), and Mountain Park Community Health Center (Phoenix). These organizations together provide healthcare for well over 200,000 patients. The Fort Defiance patients are Native American (mainly Navajo). The other four organizations serve mainly Hispanic populations. Over 50% of patients at ACHCN facilities are Medicaid (Arizona Health Care Cost Containment System) recipients. ACHCN organizations and patients were the basis for three NIH proposals in FY 2009: Challenge Grant (stimulus package) and R21 comparative effectiveness research applications comparing a telemedicine virtual colonoscopy approach with conventional methods for colorectal cancer screening in Native Americans; and randomized patient navigator and related interventions for improving cancer screening uptake and follow up in Hispanic populations. In addition to experimental clinical and translational research at UA, TRIF Regents Innovation Fund supports three major projects at ASU and NAU, as described below.

2. HRAA Projects at ASU and NAU

TRIF Regents Innovation Fund support to HRAA is devoted exclusively to two ASU projects and one NAU project: Arizona Insulin Resistance (AIR) Registry project and the Multi-Site Investigator Portal for Biomedical Collaboration, both at ASU; and On-Line Course and Program Development for the Tri-University CTSA Collaboration at NAU.

The Arizona Insulin Resistance (AIR) Registry Project (ASU)

The Arizona Insulin Resistance (AIR) Registry at ASU continues to enroll Hispanic (primarily of Mexican descent) volunteers at a rate of approximately 30 per month. Each volunteer receives an oral glucose tolerance test with insulin determinations to assess insulin sensitivity. Consenting volunteers also have DNA collected and immortalized cell lines established, as well as RNA isolated from white blood cells to assess inflammatory status. Volunteers are also asked to give consent to be contacted for participation in future clinical research trials and interventions. To date, nearly 200 participants have entered the AIR Registry, of whom 95% have consented to be contacted about future research studies and have agreed to banking of their bio-samples. These volunteers can be characterized as having an abundance of Metabolic Syndrome risk factors, which place them as a group at heightened risk for type 2 diabetes and cardiovascular disease. Through their participation, 20 volunteers so far have been diagnosed with type 2 diabetes and referred for appropriate medical care. As further evidence of the value of the AIR Registry to the Arizona community and biomedical research, two applications for access to banked bio-samples—RNA and plasma—have been received.

The Multi-Site Investigator Portal for Biomedical Collaboration (MSIPBC) (ASU)

This ASU-developed and –based project is being conducted to develop a capability that is essential for multi-party, multi-site collaboration in CTSA-translational biomedical research—a web portal that enables investigators, wherever they are and whatever affiliation they have, to: 1) find people, information, and research resources they need; 2) access and use a growing set of resources through a consistent interface; and 3) create and manage *ad hoc* collaborations for projects on which they are working, together with the resources and overall usage to provide feedback to users, as a form of online marketplace, and also to enable the CTSA management team to evaluate overall effectiveness. An approach has been developed that is easily extensible and adheres to evolving standards and software architectures. This approach will facilitate modularity and distributed functionality to enhance its robustness. In FY 2009, the first draft of the dynamic, social-network based website in the .NET framework was completed. Formal terminologies are used to tag and organize content. Website content is tagged with a formal ontology of terms (MeSH), so that it can be easily integrated in the scientific literature and researcher profiles. A MeSH term browser was created to aid in assigning MeSH terms to any content in the HRAA portal (static content, events, groups, publications, etc.).

On-Line Course and Program Development for the Tri-University CTSA Collaboration (NAU)

Education, training and evaluation, and community collaboration are central components in clinical and translational research. NAU HRAA has been charged to take the coordination lead in on-line course and program development for the tri-university CTSA collaboration. The Education Coordinator located at NAU oversees the statewide coordination and oversight of graduate education programs for HRAA. NAU is exploring cutting-edge approaches to the on-line development and delivery of a new graduate program. An academic home has been created for the graduate certificate located in Clinical and Translational Science in the Interdisciplinary Health Policy Institute. NAU HRAA is developing and overseeing a comprehensive evaluation strategy for the statewide approach to clinical and translational science. Educational accomplishments in FY 2009 include syllabus development for seven new graduate certificate courses in clinical and translational science. These courses include: HPI 600 – The Dynamics, Structure, and Management of Interdisciplinary Research (approved); HPI 601 – Responsible Conduct of Science and Regulatory Principles for Human Research (approved); ANT 521 – Research Ethics in Community Research and Vulnerable Populations (approved); and HCR 569 – Applied Principles of Data Management and Inferential Statistics in Healthcare Research (approved). Evaluation accomplishments included a biomedical informatics pilot for the AIR Registry through the HRAA web portal (MSIPBC). Community collaboration progress includes outreach to North Country HealthCare to establish an Institutional Review Board (IRB) of record.

Conclusion

UA TRIF support to UA ACTREC and TRIF Regents Innovation Fund support to HRAA projects at ASU and NAU has led to the development of essential components of a future successful CTSA application. The importance of this support cannot be overstated, and FY 2009 has seen great progress in all three projects.

Most of the CTSAs funded thus far are at institutions that formerly had NIH-funded General Clinical Research Centers (GCRC). The CaTS Clinical Research Unit at UA fulfills the functions of an erstwhile GCRC, and it is inconceivable that a future CTSA could be funded without the existence of such a facility.

The Arizona Insulin Resistance (AIR) Registry at ASU is a quintessential example of a highly innovative resource for the conduct of cutting-edge translational research. Patients and their biospecimens are accruing steadily to the Registry. A number of requests have already been received for access to Registry materials and data. The Registry and the research questions that it will allow to be answered are particularly germane to the current obesity and type 2 diabetes epidemics and their impact on health disparity populations of our state.

Biomedical informatics as a discipline is at the core of the entire CTSA initiative. The nationally and internationally renowned ASU contributions to this discipline are a major asset and have been fulsomely recognized as such in the reviews of both previous HRAA CTSA applications. MSIPBC will be an essential component at the core of the next and successful CTSA application.

An educational program meeting specific requirements is an obligatory part of a CTSA application. The lead taken by NAU in developing on-line educational resources precisely fits CTSA requirements. Furthermore, what has been accomplished plays to Arizona's acknowledged prowess in distance learning.

PERFORMANCE MEASURES—TRIF Regents Innovation Funds for HRAA

	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT						
Sponsored Awards ($ in millions)					$5	$10
Grants Received					4	9
Grants proposals submitted to funding agencies	1	1	8	3	5	32
PARTNERSHIPS AND COLLABORATIONS						
Research Projects Started	1	1	6	4	6	8
New Collaborations Between HRAA Members (Universities, Research Institutions, Hospitals, Health Plans, Healthcare Providers)	30	40	60	50	80	100
New Industry-University Collaborations Developed			6	1	3	8
New University-Government Collaborations Developed	2	2	3	2	3	6
Web Portal Hits and Links	12,000	15,000	10,000	30,000	75,000	100,000
CURRICULUM INNOVATIONS						
Courses Developed	6	6	8	7	8	8
Education Programs Approved			2	2	2	2
Dollars generated by curriculum ($ in thousands)					$20	$20

FINANCIAL INFORMATION—TRIF Regents Innovation Funds for HRAA

	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget	FY12 Revised Budget
REVENUE						
Carry forward	$ 0	$ 489,774	$ 489,774	$ 371,771		
New TRIF Revenue*	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000
TOTAL REVENUE	$ 500,000	$ 989,774	$ 989,774	$ 871,771	$ 500,000	$ 500,000
EXPENDITURES						
ASU Subcontract – Biomedical Informatics	$ 0	$ 300,000	$ 186,202	$ 263,798	$ 150,000	$ 150,000
ASU Subcontract – AIR Registry	$ 0	$ 350,000	$ 304,462	$ 220,538	$ 175,000	$ 175,000
NAU Subcontract – HRAA Office/ Course Development	$ 10,226	$ 339,774	$ 127,339	$ 387,435	$ 175,000	$ 175,000
TOTAL EXPENDITURES	$ 10,226	$ 989,774	$ 618,003	$ 871,771	$ 500,000	$ 500,000

* FY 2010-2012 TRIF Regents Innovation Funds are pending ABOR approval.

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ARIZONA ALGEBRA II END-OF-COURSE ASSESSMENT PILOT

In June 2007 Arizona, through the Governor's P-20 Council, joined a nine-state consortium to develop and implement a common Algebra II end-of-course assessment for high school students. The first Algebra II End-of-Course Assessment was offered as a pilot in the spring of 2008 to the nine participating states. With the support of the Arizona Department of Education, 1,200 students were tested at a cost of approximately $30,000—$15,000 provided by the Arizona Board of Regents using TRIF Regents Innovation Funds, along with matching funds from two foundation partners.

A second testing was administered in the spring of 2009 and, again, ABOR contributed half of the required funds—$15,000—with additional funds provided by foundations. The results of this test will be used to set the standards (make the test final) and establish the performance levels (cut scores). In addition, it will provide performance comparisons of Arizona's students to students in other participating states.

The objectives of the Algebra II End-of-Course Assessment are:

- *To align with the P-20 Council's math alignment work.* The P-20 Council and the Arizona Department of Education have been working together, under the guidance of Achieve, Inc.'s American Diploma Project, to increase the rigor of the Arizona Mathematics Standard as it relates to the State Board of Education's recently implemented higher graduation requirements; and to better align the content with the expectations of university faculty and employers. (Achieve, Inc. is a coalition of 31 states dedicated to aligning K-12 curriculum, standards, assessments, and accountability policies with the demands of university and work);

- *To improve curriculum and instruction.* The assessment results will help high school classroom teachers focus on the most important concepts and skills in Algebra II and identify areas where the curriculum needs to be strengthened;

- *To help postsecondary institutions determine if students are ready to do credit-bearing work.* Depending on the outcomes of this pilot, the assessment is intended to measure certain skills that students need to prepare for basic university-level, credit-bearing math courses. Postsecondary institutions should be able to use the results to advise high school students of content and skill gaps that need to be addressed before enrolling; and

- *To compare performance and progress among the participating states.* Having agreed on the core content expectations of Algebra II, states are interested in tracking student performance over time. Achieve, Inc. will issue a report each year comparing performance and progress among the participating states.

Support in the amount of $15,000 for the Arizona Algebra II End-of-Course Assessment Pilot is available from the Emerging Issues line item in the FY 2010 TRIF Regents Innovation Fund budget. The ABOR central office did not receive the invoice for the 2009 test instruments until July 2009; therefore, payment will be made in FY 2010.

IDEAS AT WORK

CENTER FOR THE FUTURE OF ARIZONA

DEDICATED TO IMPROVING THE QUALITY OF LIFE FOR ALL ARIZONANS

AUG 2009

Dr. Lattie F. Coor
Chairman and CEO

Dr. Sybil Francis
Executive Director

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

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Advancing Arizona through a Web-based Initiative
Use of FY 2010 Funds

The Center for the Future of Arizona was created to improve the quality of life for all Arizonans. The Center is committed to turning ideas into action—helping to shape and define Arizona's future through an action-oriented agenda focused on issues and topics critical to the state. More than a think tank, the center is an independent "do tank" that combines public-policy research with collaborative partnerships and initiatives that serve the public interest and the common good.

From its inception in 2002, the Center has focused on a limited set of issues that were determined to have the greatest impact on Arizona's future, drawing on existing studies and research, augmenting them where necessary, then developing an action agenda with measurable results, engaging civic and political leaders in the process to begin to take the next steps in creating our future. The vision for the future of Arizona that emerged from this deliberative process is to create an Arizona in which there are opportunities—especially education and employment opportunities—and a high quality of life for all citizens, now and for years to come.

To help realize this vision, the Center has undertaken three major projects designed to advance Arizona's capacity to compete successfully in the future. Central to these efforts is the capacity to develop and expand highly functional and financially sustainable websites that have the capacity to strategically disseminate these ideas, encourage discussion and support thoughtful action and implementation that has been supported by the Arizona Board of Regents Technology and Research Initiative Fund (TRIF) Regents Innovation Fund.

The three major initiatives are:

I. The Beat the Odds Institute –

- The Beat the Odds project (described and summarized in a companion report) is an example of the Center's "do tank" role and has been an early indicator of its intention to use electronic communication tools for collaborative, thoughtful action to improve Arizona's competiveness.

- Based on the landmark Arizona study, "Why Some Schools with Latino Children Beat the Odds…and Others Don't," and designed to improve "achievement per student" in low-income, Latino-intensive schools, the Institute is demonstrating 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. Eighty-five K-12 schools in Maricopa County, metro Tucson and Whiteriver will partner with the Beat the Odds Institute in FY 2010—an increase of 26 schools from the previous school year.

www.beattheoddsinstitute.org

- A key to the success of Beat the Odds is the online resource center—the sophisticated, highly interactive website funded by the TRIF Regents Innovation Fund. The website has been a key component in engaging BTO partner schools and key stakeholders in improving student achievement and will figure even more prominently in the future as we develop expansion models to take Beat the Odds into schools throughout the state and the nation.

II. Tough Choices or Tough Times Initiative and Pathways to Postsecondary Success –

- The Center has assumed the education sector leadership for Arizona as part of a six state national consortium committed to significantly improving student achievement through a dramatic overhaul of state education systems. Based on the reform agenda of the December 2006 report, "Tough Choices or Tough Times," from the New Commission on the Skills of the American Workforce, the consortium is challenging educators and policymakers to rethink the boundaries between pre K-12 and all forms of postsecondary education. The primary goal of the reform agenda is to prepare 95 percent of American students for college without remediation by the time they leave high school, meeting the highest international standards as they do so. In partnership with the Arizona Department of Education, the Arizona Education Association and the National Center on Education and the Economy, CFA is leading the planning process to develop an Arizona plan for the Tough Choices or Tough Times initiative. Social media and other web tools will not only permit individuals and organizations to join in this important reform initiative, but will also enable Arizona to become a force in the national reform movement.

- In June, Amanda Burke joined the Center for the Future of Arizona as Director of Education Innovation and Director of the Arizona "Tough Choices or Tough Times" Initiative. Previously, Burke was Director of Education Innovation and Policy with the Arizona State University Office of University Initiatives in the Office of the President.

- Pathways to Postsecondary Success is a major project focused on increasing student success and graduation rates through system-wide changes in public education and emphasizing the creation of seamless pathways between high school and postsecondary education for all students based on their interests and skills. The project concept is derived from "Tough Choices or Tough Times." Success for this project is tied to the kind of broad-based and widespread dialogue and involvement made possible through electronic networks such as the one developed to support the BTO Institute.

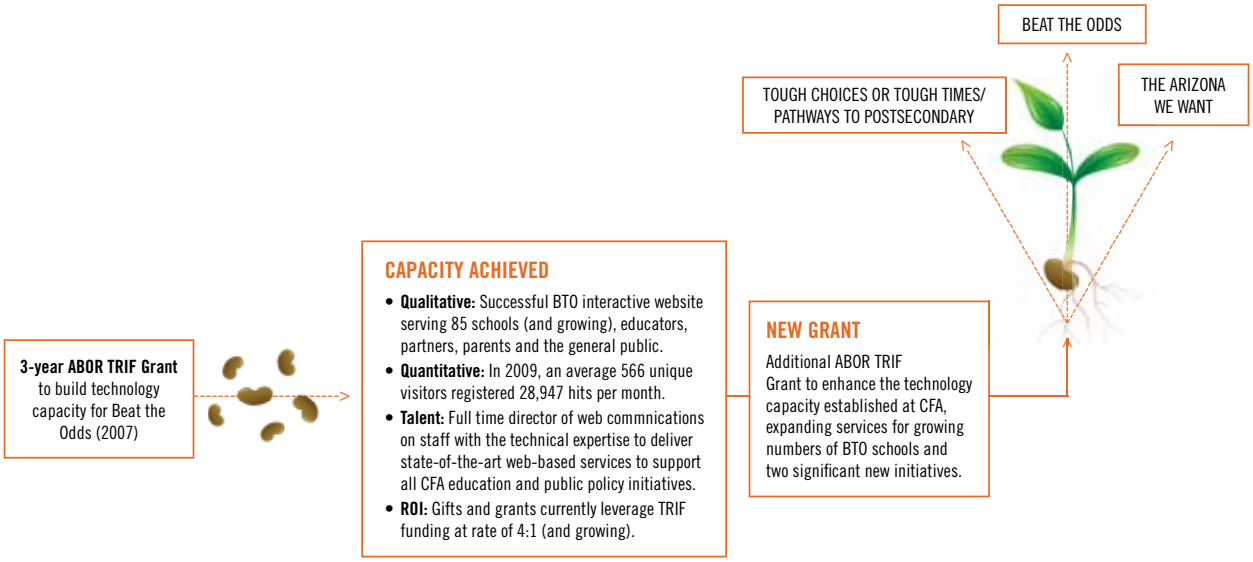
III. The Gallup Arizona Poll: The Arizona We Want

- "The Arizona We Want" initiative is designed to build a citizen's agenda for Arizona – a shared vision for our future that is compelling enough to mobilize people statewide and to survive transitions in leadership over time – and is informed by the results of the recent Gallup Arizona Poll.

- The Gallup Arizona Poll created an opportunity to understand who we are today, what's distinctive about the way we think and what we share with others. Building on Gallup research, the poll will quantify the level of citizen engagement in Arizona and look at the relationship between engagement and prosperity in our state. Based on citizen perspectives expressed through the Poll, the Center will create a framework for action that includes specific actions and measureable goals, as well as opportunities for further information, thought and discussion.

- A successful citizen's agenda must be grounded in innovative research that capitalizes on advances in the field of behavioral economics; the Gallup Organization has provided that for the Gallup Arizona Poll. Success also requires a cutting edge capacity in information technology that can a) disseminate research data and ongoing information to citizens throughout the state, b) link a wide array of strategic partners in all sectors and encourage discussions in real time, and c) support broad-based social networking that provides Arizona citizens with opportunities to directly participate in planning discussions on issues of public importance. TRIF funds are helping provide that capacity.

The graphic below depicts how these initiatives build on the success of the initial TRIF grant and how we will enhance technology capacity to accomplish the goals of the grant.



The TRIF Regents Innovation Fund is enabling the Center to staff and enhance the development of technically advanced, state of the art websites with bilingual features supporting the delivery and reform of education programs and services throughout the state and beyond, and connecting citizens and policy makers in constructing and implementing a citizen's agenda for The Arizona We Want. The ABOR/TRIF funded websites are supported by a network of staff, consultants and partners and provide opportunities for students interested in civic leadership and public policy to learn to use technology for social change.

Taken together these efforts create a window of opportunity for Arizona to play a leadership role in addressing the great challenges of our time. The capacity funded through TRIF is designed to provide the technical infrastructure needed for the level of collaboration and thoughtful action that is required to move Arizona forward.

Financial Information

Resources and Planned Expenditures

	FY 2010	FY 2011	FY 2012*
REVENUE			
TRIF Revenue	$225,000	$225,000	$225,000
TOTAL REVENUE	$225,000	$225,000	$225,000
OPERATING BUDGET			
Personal Services	$150,000	$150,000	$150,000
Outside Vendors	$72,000	$72,000	$72,000
Equipment Fees	$3,000	$3,000	$3,000
TOTAL EXPENDITURES	**$225,000**	**$225,000**	**$225,000**

* Contingent upon approval of funding by the Arizona Board of Regents.

Anticipated Results

This critical time in our state's history creates the opportunity for Arizonans to come together—both citizens and leaders—to create the future we want and need. These projects – planning, building and maintaining sustainable, world class electronic networks to support education reform and a sustainable future—are intended to create the technical infrastructure needed to provide all stakeholders—citizens, policy makers, business and civic leaders—with the electronic communication tools they need for collaborative, thoughtful action.

Core to moving these initiatives forward is the capacity the Center has developed via the ABOR funding for using advanced information technology in ways that give "voice" to the people of Arizona and empower them as thoughtful and involved citizens. We strongly believe that the combination of citizen support and committed leadership will result in a compelling agenda for Arizona.

Together, we believe these three major projects of the Center will enable Arizona to align our educational system, resources and sense of purpose with the aspirations of our citizens for sustainable prosperity. Central to the success of this effort is the continued development and expansion of our highly interactive websites that are designed to offer the same level of sophisticated functionality and customer service that drive all global enterprise today.

In combination, these initiatives and the websites that support them are vital to the challenge of advancing Arizona and transforming our state into one of the best places in the nation to live, raise a family and prosper.

Management

Center for the Future of Arizona

Lattie F. Coor, Ph.D.

Chairman & CEO

Sybil Francis, Ph.D.

Executive Director

Marjorie A. Kaplan, Ph.D.

Beat the Odds Institute Director

Learn More

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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

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

REGENTS INNOVATION FUND

Operating

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ -	$ -	$ -
TRIF Revenue	110,000	135,837	150,000
TOTAL REVENUE	**$ 110,000**	**$ 135,837**	**$ 150,000**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ 80,000	$ 92,899	$ 110,000
ERE	20,000	25,125	28,000
All Other Operating	10,000	12,242	12,000
Subtotal Operating Budget	**110,000**	**130,266**	**150,000**
GRANTS/PROJECTS:			
Subtotal Grants/Projects	**-**	**-**	**-**
EXPENDITURES GRAND TOTAL	**$ 110,000**	**$ 130,266**	**$ 150,000**

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.

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

TRIF STRATEGIC INVESTMENTS (TSI) SUMMARY

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 27,921	$ 27,921	$ 223,759
TRIF Revenue	250,000	195,838	-
TOTAL REVENUE	**$ 277,921**	**$ 223,759**	**$ 223,759**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ -	$ -	$ -
ERE	-	-	-
All Other Operating	-	-	27,921
Subtotal Operating Budget	**-**	**-**	**27,921**
GRANTS/PROJECTS:			
Higher Education in Rural Southern Arizona (UA)	250,000	-	195,838
Subtotal Grants/Projects	**250,000**	**-**	**195,838**
EXPENDITURES GRAND TOTAL	**$ 250,000**	**$ -**	**$ 223,759**

TSI funds were allocated to the universities beginning in December 2007 consistent with the FY 2008-2011 TSI budget approved by ABOR in December 2007. With the exception of a projected carryforward amount of $27,921 into FY 2009 and FY 2010 reported on the Central Office Grand Summary page, all TSI revenue and expenditure numbers are included in the universities' reports. The $195,838 of FY 2009 new TRIF revenue will be allocated to UA in FY 2010. Expenditure of this amount is reported in UA's FY 2010 budgeted expenditures and is shown here for informational purposes only. It is not included in the Central Office Grand Summary.

ABOR CENTRAL OFFICE

TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

FY 2009 ACTUAL / FY 2010 BUDGET

ARIZONA REGENTS REACH OUT (ARRO) GRANTS SUMMARY

	FY 2009 REV BUDGET	*FY 2009 ACTUAL*	*FY 2010 BUDGET*
REVENUE			
Carry Forward	$ 106,211	$ 123,097	$ 339,934 [1]
TRIF Revenue	600,000	470,007	200,000
TOTAL REVENUE	**$ 706,211**	**$ 593,104**	**$ 539,934**
EXPENDITURES			
OPERATING BUDGET			
Personal Services	$ 75,000	$ 57,697	$ 80,000
ERE	25,000	21,582	25,000
All Other Operating	12,000	9,619	11,675
Subtotal Operating Budget	**112,000**	**88,898**	**116,675**
GRANTS/PROJECTS:			
FY 2010 Grants	-	-	241,689
FY 2009 Grants	200,000	108,443	86,754
FY 2008 Grants	121,143	26,327	94,816
FY 2007 Grants	91,900	89,502	-
Projects to be determined	181,168	-	-
Subtotal Grants/Projects	**594,211**	**224,272**	**423,259**
EXPENDITURES GRAND TOTAL	**$ 706,211**	**$ 313,170**	**$ 539,934**

[1] Pursuant to ABOR Technology Oversight Committee direction in June 2009, $60,000 of NAU AZUN funds will be transferred to the ARRO Grant program in FY 2010 to support funding for the Advancing Arizona through a Web-based Initiative project.

ARIZONA REGENTS REACH OUT (ARRO)
FY 2009 Year-End Report

A. Program Overview:

The Arizona Regents Reach Out (ARRO) grant program was first authorized in spring 2005 and issued its first grant awards in November 2005, with funding starting January 1, 2006. ARRO awards support innovative e-learning or distance-learning projects from faculty and staff at all three universities, with an emphasis on projects that address a significant workforce development need and are collaborative, transferable, portable, shareable, and scalable.

New rounds of ARRO grants were awarded in 2007, 2008, and 2009. Throughout, the following overall program goals and objectives of ARRO funding have remained essentially unchanged, except for an added emphasis on inviting proposals that address the issue of teacher preparation and/or certification in science, technology, engineering, and mathematics (STEM):

- Address a clearly identified and demonstrated workforce demand or need in Arizona;
- Promote rapid development of high-quality online, distance-learning or technology-assisted projects;
- Will have a significant and demonstrable impact on workforce development in Arizona;
- Demonstrate feasibility;
- Are transferable, portable, sharable, and scalable and have significance beyond the grant period;
- Leverage scarce resources through collaboration with other departments, universities, or other entities and securing matching funds;
- Address a program or course of study, rather than an individual course only.

B. 2006 ARRO Projects:

In the initial 2006 funding round, nine project grants totaling $457,535 were awarded, out of 60 total proposals received. These projects ran from January 1, 2006, through July 31, 2007, with several no-cost extensions into the fall 2007 semester. All 2006 project accounts were reconciled and the books closed in January 2008.

C. 2007 ARRO Projects:

Nine project grants totaling $489,860 were awarded in the 2007 ARRO funding round. The projects began January 1, 2007. Five ended on June 30, 2008; four were granted

no-cost extensions to allow the teams to complete the planned activities. All 2007 project accounts were reconciled and the books closed in January 2009.

D. 2008 ARRO Projects:

1. New Grant Awards: Seven new ARRO grants were awarded during FY 2008, in two funding rounds. Projects started January 1, 2008, and concluded June 30, 2009, with final reports due July 31, 2009. Following is a brief description of the intent and priorities for each funding round:

- ***2008 "Step-Up" Projects.*** Based on the promise shown in their final project reports, six of the 2006 ARRO project teams were invited to apply in fall 2007 for new "Step-Up" funding, designed to bring their successful 2006 ARRO projects to full implementation, to the next level of development, or into new customer markets. All four proposals received were funded, at a total of $123,277.

- ***2008 Regular-Round Projects.*** In alignment with the interests of the Governor's P-20 Council, the 2008 ARRO grant process especially invited proposals that particularly address the issue of teacher preparation and/or certification in science, technology, engineering, and mathematics (STEM). Of the five eligible proposals, two were converted to funding through the Federal Improving Teacher Quality (ITQ) program, which ABOR administers for the Arizona Department of Education. The remaining three ARRO proposals were awarded a total of $119,008, with two from Northern Arizona University and one from University of Arizona.

2. Special 2008 Allocation: In April 2008, the Technology Oversight Committee approved an immediate allocation from FY 2008 ARRO funds of $195,000 for the Tri-University Vulnerability Scanning/Management Solution. This initiative includes three software packages that will be implemented at each of the universities that help address information technology (IT) security issues and partially respond to recommendations in a recent Auditor General IT Security Performance Audit. This was also a recommendation of the Moran Technology Consulting report on IT collaboration opportunities.

E. ARRO Activity in FY 2009:

1. New 2009 ARRO Awards: The Request for Proposals for 2009 ARRO projects was released in early July 2008, inviting proposals of up to $50,000 for single-university projects and $100,000 for multi-university collaborations. For the second year, the ARRO process sought to align with the interests of Governor Janet Napolitano's P-20 Council by inviting proposals that address the issue of teacher preparation and/or certification in science, technology, engineering, and mathematics (STEM).

Of the 12 eligible proposals received, the review panel ultimately recommended funding 7 at a total of $290,625, with funding split between ARRO ($200,000) and AZUN ($90,625). Projects will run from January 5, 2009, through June 30, 2010, with the first interim progress reports due July 31, 2009. ***For project details, please see Attachment A.***

2. Special Report: Status of Completed ARRO Projects (2006, 2007) as of March 2009. In early 2009, at the request of the Regents, ABOR staff conducted a post-audit of all 21 completed ARRO projects from 2006 and 2007. The purpose was to:

- Catalog actual benchmark outcomes for each project; and
- Find out the degree to which the projects were being sustained and continuing to produce results since funding ended June 30, 2008.

The results, summarized on ***Attachment B***, clearly show that resources developed with ARRO funds are indeed being sustained, expanded, enhanced, and advanced, in important and meaningful ways, well beyond the end of the ARRO funding itself.

- For all 21 projects, during their ARRO funding periods:
    - 41 new distance-learning courses were created;
    - 46 existing courses were converted to distance-learning format;
    - At least 1,136 students were enrolled in the new or converted distance-learning courses.
- Since their ARRO funding ended on June 30, 2008, for the 18 projects for which this data was reported, as of March 2009:
    - 26 *additional* new courses had been created, with others in process;
    - 25 *additional* courses were converted to distance-learning format;
    - At least 945 *additional* students had enrolled in the ARRO-funded courses.

Many other distance-learning resources were created with ARRO 2006 and 2007 funding and are continuing to be expanded to new, often non-traditional markets, including curriculum plans for new undergraduate and graduate degrees; professional certificate programs; community-based and noncredit training modules; and web-based skill-building tools available for public access. These additional major outcomes are also noted in the final column of Attachment B.

F. Planned Activity for FY 2010:

The ARRO FY 2010 budget for new-project funding is $241,689, which will be distributed as follows:

- **Special Project: Advancing Arizona Through a Web-Based Initiative.** In June 2009, the ABOR Technology Oversight Committee approved $160,000 in ARRO funding in FY 2010 to partially support Year 1 of a special project called "Advancing Arizona Through A Web-Based Initiative," through the Center for the Future of Arizona. ARRO funding will consist of (a) $100,000 from the ARRO FY 2010 budget and (b) a transfer of $60,000 from the NAU AZUN funding into the ARRO grant account.

- **New Grant Awards in FY 2010.** The balance of the FY 2010 grants and projects budget, at $81,689, is available for new grant awards during FY 2010. It is possible this amount will be supplemented by unexpended funds from 2008 ARRO projects, which closed out on June 30, 2009, and whose final financial reports are due by July 31, 2009. Because grant funding is limited, we intend to forego the traditional competitive grant cycle and instead have invited informal proposals from four current ARRO project teams whose projects show significant promise and whose work could be significantly advanced by an additional award of $30,000 to $70,000. Proposals will be reviewed by staff, and recommendations presented to the ABOR Technology Oversight Committee for final action.

ATTACHMENT A:
Approved 2009 ARRO / AZUN Projects

Institution	Title/Summary	Award
Projects to be managed by ABOR, funded through ARRO with supplemental AZUN funding:		
ARO 09-01 ASU Ledlow	***Masters in Sustainability for Mid- and Early-Career Professionals:*** ASU's School of Sustainability will pilot an online professional masters program that builds the skills of early- and mid-career professionals in the emerging field of sustainability. We will work with corporate partners Dell and APS, and the Carey School of Business, to create a flexible program for anytime, anyplace learning.	$50,000
ARO 09-02 ASU Poly Niemczyk	***Aviation Online: Advancing Collegiate Aviation Opportunities:*** The Aeronautical Management Technology department is the only aviation program in the Arizona state university system. This project will develop online opportunities in order to increase student retention, better utilize ASU resources, and fulfill the growing demand for highly trained aviation professionals.	$49,928
ARO 09-03 ASU + UA Barker	***Teaching an Enhanced, Advanced, Customized Hands-on Technology Education Course (Teach-Tec)****:* Partnering with industry and prestigious programs at both ASU and the UA, this project will offer a 12-hour teacher certificate program in how various technologies (e.g., videoconferencing, podcasting, document camera, DVD and VCR, the Internet, and text messaging) can serve as high-impact educational tools to enhance the K-12 education experience.	$39,360
ARO 09-04 NAU McDonough	***Curriculum Development of the On-Line "Teaching English as a Second Language" (TESL) Graduate Certificate:*** The project will develop four graduate web courses in TESL/AL so that the TESL Graduate certificate can become a completely on-line program. Two of the six required courses have been developed and are in regular rotation, and the proposed project involves the design and implementation of the remaining four courses.	$28,200
ARO 09-06 UA Christopherson	***Online Geospatial Education and Curriculum Development for K-12 Teachers:*** This project addresses standards for math and science in K-12 schools and helps build a geospatial workforce by providing foundational GIS (geospatial information systems) education and practical curriculum development for K-12 teachers. The first of two online courses to be developed will provide Arizona teachers with fundamental skills to introduce (GIS) into their classrooms. The second provides a flexible, modular approach to building curriculum that meets math and science standards.	$49,397
TOTAL:		$216,885
Portion to be funded through ARRO dollars:		$200,000
Balance, to be paid into ARRO account from AZUN dollars:		$16,885
PROJECTS TO BE FULLY FUNDED THROUGH AZUN and MANAGED BY NAU:		
ARO 09-05 NAU Begay	***Public Health Certificate for Entry-Level Health Employees:*** This project will develop a fully online undergraduate certificate in Public Health and develop a protocol for determining Indian Health Service public health work competencies that align with Public Health academic learning outcomes. The goal is to increase opportunities for low skill level American Indian health workers in rural Northern Arizona to achieve a Public Health certificate that will increase their job skills as well as increase their career development.	$25,751

ARO 09-07 UA Nelson	***The UA ArizonaNativeNet Program: "Federal Indian Law and Policy: Tribal Sovereignty and the Legal Relationship Between Tribes and the U.S.":*** This course is the proposed new entry in ArizonaNativeNet's series of high-quality distance-learning curricula designed for tribal leaders, educators, students, attorneys and others in the field. This project builds on previous ARRO funding to expand existing collaborations with tribal, state, and federal governments and educational institutions. Anticipated revenue streams from the completed series include academic, legal and other sources.	$47,989
TOTAL, fully-funded AZUN projects:		$ 73,740

ATTACHMENT B.
Status of Completed ARRO Projects (2006, 2007) as of March 2009

KEY TO PROJECT OUTCOMES AND PERFORMANCE MEASURES:

A = Total proposed or projected in original proposal
B = Actual, during project funding period
C = Additional, from project close through spring 2009

Project Name	Description	Project Outcomes/Performance Measures:				Other Major Outcomes/Notes (Selected):
		Key	New Courses	Courses Converted	Students Enrolled	
ASU, NAU, UA: ARO06 05 Creation of an On-Line Masters of Advanced Studies Degree in Geographic Education **($93,675)**	Complete a new on-line Master in Advanced Studies in Geography Education.	**A➔**	9	0	20	• 16 teachers will graduate with their MAS-GE in May 2009 • 12 are expected to graduate 5/2010 • Team is exploring program expansion with social studies concentration • See http://geography.asu.edu/masge
		B➔	9	0	18	
		C➔	0	0	30	
NAU: ARO06 0610 Autism Spectrum Specialist Program 2005 **($99,494)**	Establish a 12-credit graduate Autism Spectrum Disorders Specialist Program (ASDSP).	**A➔**	2	4	60	• Developed 15-hour graduate certificate program • 29 students completed the 15-credit program • All three universities are continuing to offer the 15-credit program
		B➔	3	4	114	
		C➔	1	0	162	
NAU, ASU, UA: ARO06-11 Expansion of Gerontology Programs: On-Line Coursework **($88,309)**	Develop online course to make gerontology education available in remote areas and support the Governor's Aging 2020 plan.	**A➔**	6	0	100	• Additional enrollments from NAU not included in these figures • Two additional courses will be offered for first time in fall 2009/Spring 2010
		B➔	6	0	0	
		C➔	0	0	170	
NAU: ARO6-12 Preparing Prospective Teachers for Performance-Based Assessment **($49,995)**	Coach 40 teacher candidates in preparing video self-assessments required for teacher certification.	**A➔**		0	40	• 100% of teacher participants completed their certification portfolio videos by project end • 25 additional teachers took part in 2007-2008 academic year • Most recent update 10/22/07 • See http://portfolio.coe.nau.edu
		B➔	0	0	43	
		C➔	Unkn.	Unkn.	25+	
NAU: ARO6-13 Development of an Allied Health 2+2+2 Educational Model **($49,580)**	Expand "anytime, anyplace" bachelors and masters degree options in high-demand allied health professions.	**A➔**	5 new progs.	NA	15	• Created 5 online undergrad majors in allied health fields; 24 students enrolled by end of funding • Two new courses approved for MA/Health Science emphasis • Most recent update 5/8/07
		B➔	5 new progs.	NA	24	
		C➔	Unkn.	Unkn.	Unkn.	
NAU/UA: ARO615/19 Secondary On-Line Integrated Science Teacher Certification Program **($99,910)**	Revises the On-Line Math/Science Teacher Certification Program funded by ABOR, to be science-specific.	**A➔**	2	7	20	• 100% pass rate on AEPA professional knowledge test • Math/science programs are now state- and nationally-approved • 12 pending applications for summer enrollment
		B➔	2	7	13	
		C➔	1	1	30	
UA: ARO620 Anytime Learning About "Plants and Our World" **($28,570)**	Revises *Plants and our World* Online, which fulfills General Education graduation requirements.	**A➔**	0	1	Unkn.	• Revised course was offered starting Winter 2006-07. • Course now available through AZUN. • Most recent update 11/1/2007.
		B➔	0	1	Unkn.	
		C➔	Unkn.	Unkn.	Unkn.	

Project Name	Description	Project Outcomes/Performance Measures: Key	New Courses	Courses Converted	Students Enrolled	Other Major Outcomes/Notes (Selected):
ASU: ARO636 Preparation of BSN/MS Nursing Students with 2nd Degrees Through an Online Accelerated Program **($44,557)**	Develops a hybrid program to prepare 2nd-degree students for bachelors and master's degrees in nursing.	**A➔**	0	6	0	• Distance learning components integrated in all 20 courses of the new 2nd Degree Curriculum • No enrollment – pending funding • Modified courses also available to 260 pre-licensure nursing majors.
		B➔	0	5	0	
		C➔	20	20	0	
NAU: ARO641 Reaching Out to Native Americans **($4,219)**	Creates a web-based "Native Peoples of North America" course to reach out to Native American students.	**A➔**	1	1	60	• Creating and offering additional web-based sections • Adding interactive modules to enhance face-to-face • Demand and capacity have both continued to increase
		B➔	1	1	60	
		C➔	0	0	90	
UA: ARO658 Arizona NativeNet Tribal Leadership Distance Learning Education Project b	Develops two distance courses targeting tribal governance, economic development and law enforcement.	**A➔**	2	0	0	• Web users of two courses = 39,100 in 2007; 25,800 in 2008. • Users identified from 114 countries • Will be used as template for 4 add'l programs totaling 32 credits in new and potentially lucrative markets • See www.arizonanativenet.com
		B➔	2	0	31	
		C➔	1	0	40	
UA: AZU07-01 Methamphetamine and Other Illicit-Drug Education **($99,977)**	Produces an online resource to educate medical/health students and professionals about methamphetamine and other illicit drugs.	**A➔**	1	NA	40	• Course is offered each spring and is available through AZUN. • Course draws students throughout Rocky Mountain health consortium. • Has been presented at two major regional venues. • Nat'l Area Health Educ Ctr interested in developing certificate program
		B➔	1	NA	8	
		C➔	0	NA	21	
ASU: AZU07-02 Course Curriculum for a Tribal Financial Manager Certificate **($53,900)**	Multi-disciplinary team develops a curriculum plan and certification program to meet expanding needs of tribal governments and their	**A➔**	Cert. program	Cert. program	NA	• Seeking Federal funding for phase II, implementation • Has database of potential students Have received national recognition • Major partnership with certificate accreditation orgn.
		B➔	NA	NA	NA	
		C➔	NA	NA	NA	
NAU: ARO07-01 Current Shakespeare Scholarship and the Secondary Classroom **($66,203)**	Creates website based on cutting-edge Shakespeare research, addressing high school education standards.	**A➔**	0	0	0	• Website and DVD produced and promoted • 200 DVDs distributed via ASU English Education program • Promotion will continue via all online NAU Shakespeare classes • See http://nau.edu/teachshakespeare
		B➔	0	0	0	
		C➔	0	0	0	
NAU/ASU: ARO07-02 Completing Suite for On-Line Delivery of Existing Masters Degree in Construction Mgt. **($99,135)**	Links existing courses to offer an entire suite of on-line courses leading to a Master of Science Degree in Construction Management.	**A➔**	3	10	20	• Project completed as scheduled. • Aggressively presented at industry venues; "potential for large industry cohorts." • Most recent update 9/8/2008. • See http://construction.asu.edu
		B➔	3	10	20+	
		C➔	Unkn.	Unkn.	Unkn.	
NAU: ARO07-03 Self-Paced Competency-Based Music History Tutorial for Graduate Students **($8,148)**	Creates noncredit on-line music history tutorial to content competency of entering grad students in music.	**A➔**	1	1	NA	• 5 online learning modules created for noncredit tutorial • 3 additional major modules added since close of ARRO project • Course was piloted in Fall 2008 • Now required for all incoming graduate music students at NAU
		B➔	1	1	NA	
		C➔	0	0	NA	

Project Name	Description	Project Outcomes/Performance Measures: Key	New Courses	Courses Converted	Students Enrolled	Other Major Outcomes/Notes (Selected):
UA/NAU: ARO07-04 On-Demand Remote Access to Electron Microscopes for Bio and Nanotechnology Courses **($87,391)**	Develops on-demand remote link to existing Electron Microscope Facility, providing live microscope time for courses at NAU and UA.	**A➔**	0	7	400	• Technical issued delayed full implementation; now resolved • Will be developed for 4 add'l courses for up to 55 students per semester • Presented at Microscopy and Microanalysis Conference in Albuquerque – 80 people • See http://taipan.mse.arizona.edu
		B➔	0	5	80	
		C➔	0	1	101	
UA: ARO07-05 Project LEADER (Leaders' Ethical Allocation in Disasters Emergency Resources) **($49,406)**	Develops online training for students, health care leaders and community leaders for effective decision-making in disaster situations.	**A➔**	NA	NA	NA	• The 3 videos are being used in English and Spanish versions throughout U.S. and worldwide. • Videos posted online and in CD • See www.crestaznm.org *5,600 online users during course of project; numbers not tracked since project end
		B➔	NA	NA	5,600*	
		C➔	NA	NA	NA*	
UA: ARO07-06 Development of an Accredited Medical Physics Educational Program **($47,603)**	Develops a complete Accredited Medical Physics Educational Program, including graduate program and residency.	**A➔**	6	4	10	• PSM Medical Physics is now a recognized program; 10 applicants for fall 2009 enrollment. • More than 50 applicants expected for 1 position in summer 2009 residency program • Plans to add radiology courses and internships
		B➔	6	4	6	
		C➔	0	0	6	
UA: ARO07-07 Initiating a Distance-Learning Program to Prepare Teachers of Deaf and Hard-of-Hearing Children **($50,000)**	Reconfigures UA's existing program to prepare teachers of deaf and hard-of-hearing children to a web-based program.	**A➔**	1	5	12	• 15 students are currently admitted to the full program; 10 other applicants. • 11 out of 15 students are "non-traditional" part-time, already teaching • Universities in Colorado and Florida have requested to enroll their students. • Model is being used to develop other special ed courses for online delivery.
		B➔	0	5	39	
		C➔	1	2	13	
UA: ARO07-08 Online Translator Education Program **($32,700)**	Jump-starts an online course in medical translation, which will serve as a pilot for online courses in legal, business and financial translation.	**A➔**	1	NA	13	• Courses presented at 3 national conferences. • Course approval completed for 2nd course in sequence. • Collaborations initiated with other non-AZ universities • Seeking funding to complete translation certificate sequence and teaching-track option
		B➔	2	NA	13	
		C➔	1	NA	13	
UA: ARO07-09 Project REACH: Reaching Out and Expanding Access to Coursework in Human Development **($49,274)**	Converts three foundational courses to reach out to students in pre-nursing, pre-health, pre-education, and social and behavioral sciences.	**A➔**	NA	3	630	• Increased enrollment by 30% through adding online courses • Course is self-sustaining through credit outreach, summer/winter sessions • Will offer 10 sections in online format in summer 2009 • Seeking funding to develop an online Certificate in Human Development
		B➔	NA	3	667	
		C➔	1	1	244	

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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.

D. Formats for Submission of Proposals

1. 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;

2. The requested duration of the proposed project or activity;

3. Proposed detailed performance measures, desired outcomes, and proposed methodology for evaluating progress in attaining the desired outcomes; and

4. 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.

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.