
**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, 2010,
as required by A.R.S. §15-1648(D).**

September 1, 2010

This document may be accessed at www.azregents.edu

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

For the Fiscal Year Ended June 30, 2010

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Arizona State University

Northern Arizona University

University of Arizona

September 1, 2010

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, 2010. 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 2010 TRIF budget supported significant research projects in the biosciences; sustainability and renewable energy, including water, solar, and forest health; and

Board Members: Chair Anne Mariucci, Phoenix Ernest Calderón, Phoenix Dennis DeConcini, Tucson
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Governor Janice K. Brewer Superintendent of Public Instruction Tom Horne
Student Regents: Jennifer Ginther, NAU William R. Holmes, UA
President Thomas K. Anderes, PhD

Governor Brewer, President Burns, Speaker Adams
September 1, 2010
Page Two

optical sciences, all critical to the future economic development of the state of Arizona and to a quality educational experience for our students. TRIF supported workforce development projects, especially in Arizona's high-need areas, including The University of Arizona College of Medicine-Phoenix to train more doctors to address the shortage of physicians in Arizona. TRIF also supported the training of math and science teachers, nurses, and other health care workers.

The Arizona University System's efforts to provide access to more Arizonans were supported through TRIF funding for programs such as the Arizona Universities Network (AZUN); the NAU-Yuma campus; and teacher education, commerce/entrepreneurship, and information science-based programs offered in Arizona's southern border counties by The University of Arizona through a combination of on-site and distance education, to name only a few.

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, project management, and advisory boards.

Please contact me at 602-229-2505 or Tom.Anderes@azregents.edu if I can answer any questions or provide additional information.

Sincerely,

Thomas K. Anderes, PhD
President

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, 2010**

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, 2010, \$518.8 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 2010 TRIF budget supported significant research projects at Arizona State University, Northern Arizona University, and The University of Arizona in the biosciences; sustainability and renewable energy, including water, solar, and forest health; and optical sciences, all critical to the future economic development of the state of Arizona and to a quality educational experience for university students.
- ▶ The FY 2010 TRIF budget also supported workforce development projects, especially in Arizona’s high-need workforce areas. TRIF provided funding for The University of Arizona College of Medicine-Phoenix to train more doctors to address the shortage of physicians in Arizona. TRIF funding also supported the training of math and science teachers, nurses, and other health care workers.
- ▶ The Arizona University System’s efforts to provide access to more Arizonans were supported through TRIF funding for programs such as the Arizona Universities Network (AZUN); the NAU-Yuma campus; and teacher education, commerce/entrepreneurship, and information science-based programs offered in Arizona’s southern border counties by The University of Arizona through a combination of on-site and distance education.

- ▶ Detailed business plans for each initiative have been developed by the universities and system 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 2010 totaled \$52.6 million. This amount is 11.1% below prior-year revenue and 5.2% below revised projected revenue for FY 2010. This revenue shortfall reflects the continuing national and state recession and necessitated careful cash flow management of TRIF funds by the universities and ABOR system office in order to maintain core projects.
- ▶ Actual TRIF expenditures in FY 2010 totaled \$55.0 million, representing 84.4% 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 system office exercised sound budgetary and financial management in the expenditure of TRIF funds throughout FY 2010.
- ▶ TRIF budget guidelines adopted by the Board call for full expenditure of FY 2010 funds by December 31, 2010. The universities and system office may then request that any unexpended funds be reallocated for the same or a different use.
- ▶ Expenditure detail by university and system 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 system 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 2010, 11.7% of TRIF expenditures supported capital projects.
- ▶ This FY 2010 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 2010 ACTUAL / FY 2011 BUDGETS
SUMMARY

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE						
Carryforward	\$ 32,465,192	\$ 26,345,536	\$ 22,861,168	\$ 12,512,799	\$ 12,572,905	\$ 10,137,292
TRIF Revenue	71,922,360	71,482,244	59,463,418	55,504,859	52,603,418	52,999,981
TOTAL REVENUE	\$ 104,387,552	\$ 97,827,780	\$ 82,324,586	\$ 68,017,658	\$ 65,176,323	\$ 63,137,273
EXPENDITURES						
OPERATING BUDGET						
Personal Services	\$ 28,331,875	\$ 29,784,071	\$ 29,316,188	\$ 27,943,664	\$ 22,646,434	\$ 25,481,615
ERE	7,838,610	8,508,401	8,706,613	7,850,424	7,149,801	7,894,555
All Other Operating	23,199,744	25,496,094	20,204,529	18,325,002	14,678,099	15,768,550
Grants/Projects	1,812,640	1,702,337	1,271,151	1,409,682	864,820	1,222,253
TOTAL OPERATING BUDGET	61,182,869	65,490,903	59,498,481	55,528,772	45,339,154	50,366,973
CAPITAL BUDGET						
Building Renovation	209,107	347,337	147,127	2,670,700	690,091	4,005,500
Debt Service	8,333,939	4,990,248	6,447,274	6,103,386	5,291,886	5,050,000
ASU Polytechnic/West COPs	3,650,200	3,721,800	3,718,800	3,714,800	3,717,800	3,718,600
NAU Conference Center	4,071,491	162,830	-	-	-	-
TOTAL CAPITAL BUDGET	16,264,737	9,222,215	10,313,201	12,488,886	9,699,777	12,774,100
EXPENDITURES GRAND TOTAL	\$ 77,447,606	\$ 74,713,118	\$ 69,811,682	\$ 68,017,658	\$ 55,039,031	\$ 63,141,073
SUMMARY BY PROGRAM AREA						
Access/Workforce Development/e-Learning	\$ 21,415,578	\$ 23,459,012	\$ 19,584,040	\$ 20,503,029	\$ 16,560,078	\$ 17,344,268
Biosciences/Bioresearch	34,530,399	32,014,984	28,569,932	25,515,952	22,587,311	23,811,206
Biomedical and Health Sciences	1,199,372	2,345,392	2,728,263	223,759	-	-
Sustainability and Renewable Energy	5,440,997	7,168,311	7,639,264	8,371,561	7,186,397	7,854,508
Education and Infrastructure	10,408,324	4,949,959	6,330,618	9,358,741	5,538,752	9,911,713
Optical Sciences	3,187,607	3,340,957	3,642,702	2,584,031	2,264,489	2,444,377
Advanced Materials and Flexible Systems	-	-	-	400,000	163,500	600,000
Regents Innovation Fund	1,265,329	1,434,503	1,316,863	1,060,585	738,504	1,175,000
EXPENDITURES GRAND TOTAL	\$ 77,447,606	\$ 74,713,118	\$ 69,811,682	\$ 68,017,658	\$ 55,039,031	\$ 63,141,073

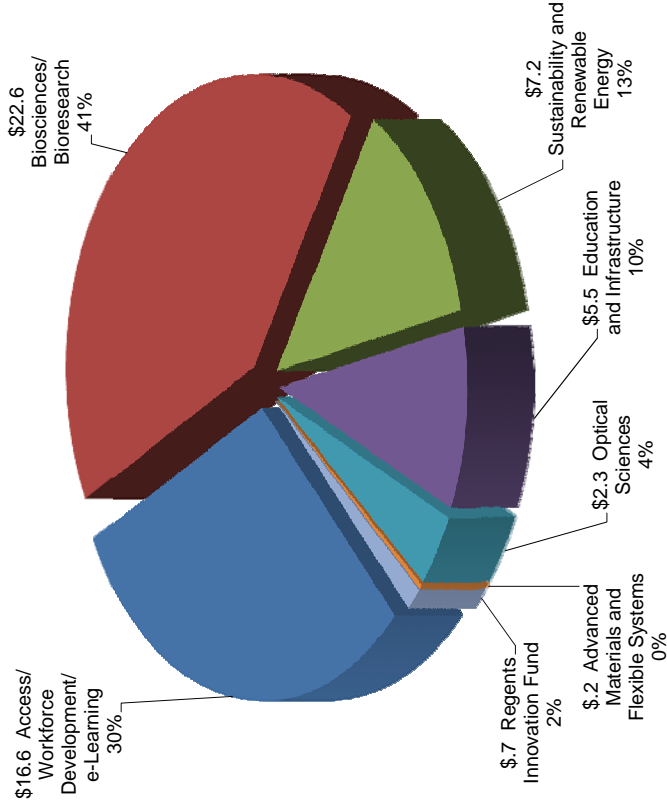
**ARIZONA UNIVERSITY SYSTEM
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA**

	FY 2010 REVISED BUDGET	FY 2010 ACTUAL
REVENUE		
Carryforward	\$ 12,512,799	\$ 12,572,905
TRIF Revenue	55,504,859	52,603,418
TOTAL REVENUE	\$ 68,017,658	\$ 65,176,323

EXPENDITURES		
OPERATING BUDGET		
Personal Services	\$ 27,943,664	\$ 22,646,434
ERE	7,850,424	7,149,801
All Other Operating	18,325,002	14,678,099
Grants/Projects	1,409,682	864,820
TOTAL OPERATING BUDGET	55,528,772	45,339,154
CAPITAL BUDGET		
Building Renovation	2,670,700	690,091
Debt Service	6,103,386	5,291,886
ASU Polytechnic/West COPs	3,714,800	3,717,800
NAU Conference Center	-	-
TOTAL CAPITAL BUDGET	12,488,886	9,699,777
EXPENDITURES GRAND TOTAL	\$ 68,017,658	\$ 55,039,031

SUMMARY BY PROGRAM AREA		
Access/Workforce Development/e-Learning	\$ 20,503,029	\$ 16,560,078
Biosciences/Bioresearch	25,515,952	22,587,311
Biomedical and Health Sciences	223,759	-
Sustainability and Renewable Energy	8,371,561	7,186,397
Education and Infrastructure	9,358,741	5,538,752
Optical Sciences	2,584,031	2,264,489
Advanced Materials and Flexible Systems	400,000	163,500
Regents Innovation Fund	1,060,585	738,504
EXPENDITURES GRAND TOTAL	\$ 68,017,658	\$ 55,039,031

FY 2010 SYSTEM ACTUAL TRIF EXPENDITURES
(in millions)



ARIZONA UNIVERSITY SYSTEM
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET CAPITAL EXPENDITURES
(\$ in thousands)

	TRIF INITIATIVE	FY 2010 Budget	FY 2010 Actual	FY 2011 Budget
ASU	<i>ASU Poly/West Certificates of Participation (COPs) *</i>	n/a	n/a	n/a
	<i>Bio and Health Initiative</i>	\$3,211	\$1,175	\$3,306
	<i>Sustainability and Renewable Energy Initiative</i>	\$380	-	\$280
	<i>Advanced Materials and Flexible Systems Initiative</i>	\$80	-	\$120
	Total Capital Expenditures	\$3,671	\$1,175	\$3,706
	Capital as % of Total ASU Expenditures	17.8%	6.3%	20.0%
NAU	<i>Arizona Universities Network (AZUN)</i>	\$500	\$500	\$500
	<i>University Initiatives</i>	\$1,603	\$1,085	\$1,850
	Total Capital Expenditures	\$2,103	\$1,585	\$2,350
	Capital as % of Total NAU Expenditures	10.5%	12.2%	13.5%
UA	<i>Bioresearch Program</i>	\$0	\$5	\$0
	<i>Education and Infrastructure Program</i>	\$3,000	\$3,217	\$3,000
	Total Capital Expenditures	\$3,000	\$3,222	\$3,000
	Capital as % of Total UA Expenditures	13.7%	17.6%	13.5%
ABOR	Total Capital Expenditures	\$0	\$0	\$0
	Capital as % of Total ABOR Expenditures	0.0%	0.0%	0.0%
Total System Capital Expenditures		\$8,774	\$5,982	\$9,056
20% Statutory Limit on Capital Expenditures		\$12,861	\$10,264	\$11,884
Capital Expenditures as % of Total System Expenditures		13.7%	11.7%	16.0%

* Not applicable. TRIF allocations for ASU Polytechnic and ASU West debt service (FY 2010 actual of \$3.7 million) are directed by statute. Therefore, these amounts are excluded from both the calculation of the total system capital expenditures and the 20% statutory limitation on capital expenditures.

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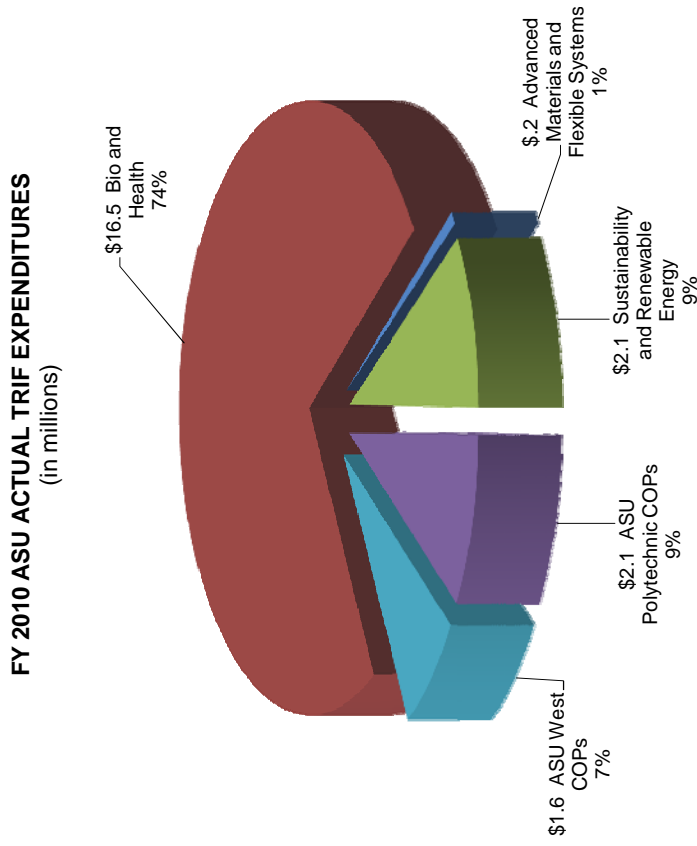
ARIZONA STATE UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGETS
SUMMARY

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE						
Carryforward	\$ 11,111,300	\$ 5,872,900	\$ 5,601,400	\$ 2,071,300	\$ 2,071,400	\$ 803,700
TRIF Revenue	27,041,400	27,886,700	23,422,500	22,237,900	21,240,400	21,437,600
TOTAL REVENUE	\$ 38,152,700	\$ 33,759,600	\$ 29,023,900	\$ 24,309,200	\$ 23,311,800	\$ 22,241,300
EXPENDITURES						
OPERATING BUDGET						
Personal Services	\$ 13,276,700	\$ 11,615,800	\$ 11,597,000	\$ 8,631,100	\$ 8,235,700	\$ 7,066,700
ERE	3,368,900	3,008,600	3,143,500	2,030,800	2,650,800	2,293,700
All Other Operating	11,166,300	8,892,500	7,346,100	6,261,800	6,728,700	5,460,600
TOTAL OPERATING BUDGET	27,811,900	23,516,900	22,086,600	16,923,700	17,615,200	14,821,000
CAPITAL BUDGET						
Building Renovation	40,100	133,300	147,100	2,670,700	-	2,705,500
Debt Service	777,600	777,600	1,000,000	1,000,000	1,175,000	1,000,000
COPs Lease Purchase Payment	3,650,200	3,721,800	3,718,800	3,714,800	3,717,800	3,718,600
TOTAL CAPITAL BUDGET	4,467,900	4,632,700	4,865,900	7,385,500	4,892,800	7,424,100
EXPENDITURES GRAND TOTAL	\$ 32,279,800	\$ 28,149,600	\$ 26,952,500	\$ 24,309,200	\$ 22,508,100	\$ 22,245,100
SUMMARY BY INITIATIVE						
Biodesign Institute (BDI/CBPI)	\$ 27,734,500	\$ 22,354,500	\$ 20,505,500	\$ -	\$ -	\$ -
Biomedical Informatics (BMI)	551,200	446,400	2,221,000	-	-	-
ASU-UA Joint Biomedical Research Fund	210,700	858,100	258,500	-	-	-
Planning for Phoenix Biomedical Campus	133,200	616,800	-	-	-	-
ASU-UA Solar Energy	-	152,000	248,700	-	-	-
Bio and Health	-	-	-	18,294,400	16,538,400	16,510,400
Advanced Materials and Flexible Systems	-	-	-	400,000	163,500	600,000
Sustainability and Renewable Energy	-	-	-	1,900,000	2,088,400	1,416,100
ASU Polytechnic COPs	2,046,100	2,082,800	2,084,200	2,083,800	2,083,800	2,081,600
ASU West COPs	1,604,100	1,639,000	1,634,600	1,631,000	1,634,000	1,637,000
EXPENDITURES GRAND TOTAL	\$ 32,279,800	\$ 28,149,600	\$ 26,952,500	\$ 24,309,200	\$ 22,508,100	\$ 22,245,100

A \$3,800 difference between FY 2011 budgeted revenues and expenditures results because the debt service schedule for ASU Polytechnic and ASU West Certificates of Participation (COPs) changed subsequent to final allocation of FY 2011 TRIF revenue by the system office. Sufficient TRIF funding will be provided by the system office to cover this debt service.

ARIZONA STATE UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA

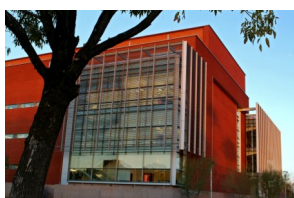
	FY 2010 REVISED BUDGET	FY 2010 ACTUAL
REVENUE		
Carryforward	\$ 2,071,300	\$ 2,071,400
TRIF Revenue	22,237,900	21,240,400
TOTAL REVENUE	\$ 24,309,200	\$ 23,311,800
EXPENDITURES		
OPERATING BUDGET		
Personal Services	\$ 8,631,100	\$ 8,235,700
ERE	2,030,800	2,650,800
All Other Operating	6,261,800	6,728,700
TOTAL OPERATING BUDGET	16,923,700	17,615,200
CAPITAL BUDGET		
Building Renovation	2,670,700	-
Debt Service	1,000,000	1,175,000
COPs Lease Purchase Payment	3,714,800	3,717,800
TOTAL CAPITAL BUDGET	7,385,500	4,892,800
EXPENDITURES GRAND TOTAL	\$ 24,309,200	\$ 22,508,100
SUMMARY BY INITIATIVE		
Bio and Health	18,294,400	16,538,400
Advanced Materials and Flexible Systems	400,000	163,500
Sustainability and Renewable Energy	1,900,000	2,088,400
ASU Polytechnic COPs	2,083,800	2,083,800
ASU West COPs	1,631,000	1,634,000
EXPENDITURES GRAND TOTAL	\$ 24,309,200	\$ 22,508,100



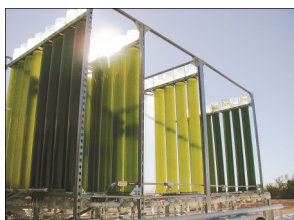
ASU[®] ARIZONA STATE UNIVERSITY

REPORT FOR THE FISCAL YEAR
ENDING JUNE 30, 2010

TECHNOLOGY AND RESEARCH
INITIATIVE FUND (TRIF)



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



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

Following the FY09 agreement to consolidate targeted research areas, FY10 TRIF funds were allocated to four targeted research initiatives referred to as BioSciences, Advanced Materials, Sustainability and Capacity Building. During FY10, these four initiatives were renamed to better align TRIF investments with ASU's overall strategic research initiatives (see below).

STRATEGIC RESEARCH INITIATIVES

ESTABLISHED		CORE			CAPACITY BUILDING	
education	earth & space exploration	sustainability & renewable energy	advanced materials & flexible systems	bio & health	science policy	informatics & communication
					humanities	social science

Bio and Health, previously BioSciences, is led by investments in the Biodesign Institute. The Flexible Display Center (FDC) represents the flagship investment for the Advanced Materials and Flexible Systems initiative, previously Advanced Materials. To better capture the breadth of efforts underway, the Sustainability initiative is now referred to as Sustainability and Renewable Energy, and is represented most notably by investments in the Global Institute of Sustainability and the Solar Powered Laboratory. Previously noted in Capacity Building, Earth and Space Exploration now falls under the Established initiative category and Capacity Building now includes science policy, humanities, social sciences, and informatics and communication.

To best leverage our institutional capabilities and provide the maximum potential impact, FY10 investments were allocated across each of these three initiative categories (Established, Core, Capacity Building). For purposes of reporting, Established and Capacity Building initiatives are included under the Core Bio and Health Initiative.

ASU TRIF PROGRAM

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Dr. Rick Shangraw
Senior Vice President
Office of Knowledge
Enterprise
Development





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



ASU's MacroTechnology Works facility in Tempe is home to the Flexible Display Center.

Overall, FY10 TRIF funding led to a significant return on investment. The Bio and Health initiative, which represents 73% of all TRIF dollars invested, exceeded FY10 award and technology transfer projections. However, due to uncertain funding streams driven by a challenging economic environment, work force contributions, in particular graduate and undergraduate employment, fell short of FY10 projections. FY10 actual returns for the Sustainability and Renewable Energy initiative were only marginally lower than FY10 projections, again in the area of work force contributions. Funding returns from the Advanced Materials and Flexible Systems initiative were significantly impacted by the departure of a key investigator. This departure resulted in the cessation of Applied NanoBioscience Center (ANBC) activities and a pull back and re-allocation of significant funding for the Advanced Materials and Flexible Systems Initiative. However, the FDC continues to make significant contributions and with FY11 plans in place to expand its funding stream, a higher ROI is anticipated.

In FY10, investigators working within these initiatives aggressively targeted high dollar value opportunities. These efforts include proposals for the establishment of two National Science Foundation Engineering Research Centers in the areas of Flexible Systems and Solar Energy, as well as a Department of Energy sponsored Solar to Fuels HUB. All of the ERCs and the HUB were invited for site visits upon successful proposal reviews. As we enter into FY11, continued investments in our strategic initiatives, together with sustained proposal activities, work force development, partnership and technology transfer activities will allow us to continue to leverage the intellectual strengths of our faculty and external collaborations, and position us well to attract significant federal, industry and foundation funding that will result in a high economic impact.

CONSOLIDATED PERFORMANCE ANALYSIS

ASU tracks and monitors performance and return on investment (ROI) for each TRIF focus area, including: federal and non-federal awards, royalty income, foundation funding, work force contributions (postdoctoral, graduate and undergraduate student employment), technology transfer activities (invention disclosures, patents filed, patents issued, start-up companies established, and signed licenses or options), and partnerships with local business and industry.

The national economic downturn and reduced sales tax revenue continues, resulting in significant additional mid-year reductions in TRIF funding. Accordingly, TRIF budgets are impacted directly.

The consolidated performance analysis reflects TRIF funding budget reductions of approximately \$1.0 million from the FY10 revised budget when compared to the actual FY10 revenue that was received. The FY11 TRIF revenue budget reflects an additional five percent, or \$1.2M reduction from the actual FY10 revenue.



Wind turbines and solar panels atop the Global Institute of Sustainability generate up to 25 kW of electricity for the Tempe campus.

ASU Consolidated	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY08	FY08	FY09	FY09	FY10	FY10	FY11
PERFORMANCE MEASUREMENTS/ACHIEVEMENTS	Actual	Actual	Actual	Actual	Actual	Proj	Actual	Proj	Actual	Actual	Proj	Actual	Actual	Proj
Bio and Health (Incl Capacity Building Project Investments)														
Return on Investment (\$ amounts in millions)														
Federal and non-federal awards												58.80	65.20	65.00
Royalty income												0.00	0.09	0.00
Foundation funding												0.50	15.60	0.50
Return Total												59.30	80.89	65.50
Technology Transfer														
New invention disclosures												150	187	151
New patent applications filed												160	232	162
New patents issued												21	44	21
Total start-up companies licensing ASU technology												4	4	4
Licenses or options signed (as indication of technology adoption by industry)												33	46	34
Work Force Contributions														
Post-doctoral appointments												81	50	93
Post-doctoral researchers leaving to enter the workforce												12	25	13
Graduate students employed												253	152	278
Graduate students earning degrees and entering the workforce												45	38	47
Undergraduate students involved												214	113	225
Partnerships/Collaborations														
The number of research grants/contracts involving funding from non-government entities												35	41	39
The number of research grants/contracts involving subcontracts to non-ASU researchers												6	14	8
Sustainability and Renewable Energy														
Return on Investment (\$ amounts in millions)														
Federal and non-federal awards												32.20	26.90	40.00
Royalty income												0.10	0.85	0.30
Foundation funding												1.50	0.88	2.50
Return Total												33.80	28.63	42.80
Work Force Contributions														
Post-doctoral appointments												29	15	35
Post-doctoral researchers leaving to enter the workforce												13	1	18
Graduate students employed												114	83	142
Graduate students earning degrees and entering the workforce												43	20	60
Undergraduate students involved												77	11	87
Partnerships/Collaborations														
The number of research grants/contracts involving funding from non-government entities												24	12	33
The number of research grants/contracts involving subcontracts to non-ASU researchers												21	0	27
Advanced Materials and Flexible Systems														
Return on Investment (\$ amounts in millions)														
Federal and non-federal awards												31.20	22.50	20.00
Royalty income												0.02	0.05	0.05
Foundation funding												0.04	0.00	0.04
Return Total												31.26	22.55	20.09
Work Force Contributions														
Post-doctoral appointments												20	1	23
Post-doctoral researchers leaving to enter the workforce												10	0	14
Graduate students employed												7	15	4
Graduate students earning degrees and entering the workforce												3	0	4
Undergraduate students involved												4	2	6
Partnerships/Collaborations														
The number of research grants/contracts involving funding from non-government entities												8	14	6
The number of research grants/contracts involving subcontracts to non-ASU researchers												3	2	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	0.05	0.09	1.40	2.53	3.8									
New products in marketplace	5	3	5	10	7									
Value of new products to ASU	0.42	0.40	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									

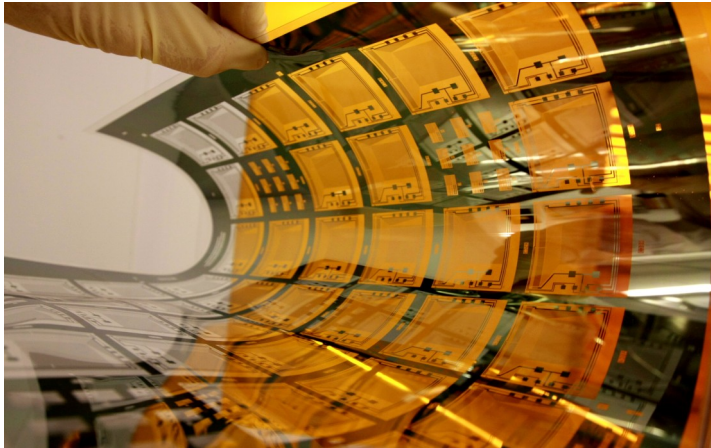
ASU Consolidated (Continued)		FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
PERFORMANCE MEASURES/DELIVERABLES		Actual	Actual	Actual	Actual	Actual	Proj	Proj	Actual	Actual	Proj
Biodesign Institute and Capacity Building Project Investments											
Work Force Contributions											
Post-doctoral 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	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 CSCSE 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	37	17	47		
The number of Biodesign Institute research grants/contracts involving subcontracts to non-ASU researchers		18	35	18	22	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										
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	1 large	7 large	3 large	3 large	4 small				
		2 small	3 small	3 small	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	8.13	2.83	2.20	
Royalty income		0.02	0.00	0.02	0.00	0.03	0.00	0.03	0.03	0.00	
Foundation funding		0.03	0.00	0.04	0.04	0.02	0.04	0.04	0.04	0.00	
Return Total		0.85	1.76	2.06	8.15	2.90	2.20	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]		2	2	4	4	2	6	2	6	2	
New mention disclosures and patent applications filed		N/A	N/A	3	2	5	2				
Tech 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	0	13	11	11				
Graduate students earning doctoral degrees in BMI		N/A	N/A	N/A	5	0	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/Collaboration											
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											
Royalty income											
Foundation funding											
Return Total											
Technology Transfer											
New invention disclosures											
New patent applications filed											
New patents issued											
Total start-up companies licensing ASU technology											
Licenses or options signed (as indication of technology adoption by industry)											
Work Force Contributions											
Post-doctoral appointments											
Post-doctoral researchers leaving to enter the workforce											
Graduate students employed											
Graduate students earning degrees and entering the workforce											
Undergraduate students involved											
Joint ASU-UA Biomedical Research Fund											
Return on Investment (\$ amounts in millions)											
Federal and non-federal awards											
Royalty income											
Foundation funding											
Return Total											

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 ROI 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 Arizona Technology Enterprises (AzTE) activities. 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 ASU partners, such as the Mayo Clinic, Barrows Neurological Institute, Translational Genomics Research Institute and industry partners provides additional opportunities to expand and enhance ASU research in Bio and Health, Advanced Materials and Flexible Systems, and Sustainability and Renewable Energy.
- **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	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY10	FY11
	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Rev Budget	Actual	Rev Budget
ASU CONSOLIDATED TRIF FINANCIAL SCHEDULE											
Bio and Health											
Revenue									\$ 18,294,400	\$ 17,328,900	\$ 16,510,400
Expenditures									18,294,400	16,538,400	16,510,400
Return on Investment (Return Total / Expenditures)									3.2:1	4.9:1	4.0:1
Sustainability and Renewable Energy											
Revenue									\$ 1,900,000	\$ 2,104,500	\$ 1,416,100
Expenditures									1,900,000	2,088,400	1,416,100
Return on Investment (Return Total / Expenditures)									17.8:1	13.7:1	30.2:1
Advanced Materials and Flexible Systems											
Revenue									\$ 400,000	\$ 163,500	\$ 600,000
Expenditures									400,000	163,500	600,000
Return on Investment (Return Total / Expenditures)									78.2:1	137.9:1	33.5:1
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	\$ 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	20,505,500			
Return on Investment (Return Total / Expenditures)	2.5:1	0.4:1	2.1:1	1.9:1	2.4:1	1.9:1	4.1:1	2.9:1			
Biomedical Informatics											
Revenue						2,000,000	2,384,600	2,217,400			
Expenditures						551,200	446,400	2,221,000			
Return on Investment (Return Total / Expenditures)						3.2:1	18.2:1	1.0:1			
Solar Energy											
Revenue							1,050,000	248,700			
Expenditures							152,000	248,700			
Return on Investment (Return Total / Expenditures)							N/A	29.9:1			
ASU-UA Joint Biomedical Research Fund											
Revenue						1,000,000	1,255,600	258,500			
Expenditures						210,700	858,100	258,500			
Return on Investment (Return Total / Expenditures)						N/A	1.0:1	N/A			
Phoenix Biomedical Campus Planning											
Revenue						750,000	616,800				
Expenditures						133,200	616,800				
Return on Investment (Return Total / Expenditures)						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	3,740,200	3,714,800	3,714,900	3,714,800
Expenditures	-	6,128,000	3,356,200	3,708,500	3,790,300	3,650,200	3,721,800	3,718,800	3,714,800	3,717,800	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	29,023,900	24,309,200	23,311,800	22,241,300
Expenditures	4,825,100	26,262,300	16,059,700	22,563,300	23,554,400	32,279,800	28,149,600	26,952,500	24,309,200	22,508,100	22,245,100



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 becoming more competitive nationally. The investments have evolved over time to reflect current needs and projected opportunities. 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 strategic research areas.
- 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 all strategic investments.
- Enhance interdisciplinary collaborative research in the strategic research areas.
- 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 research areas.



ASU's solar portfolio is the largest on a single U.S. university campus

GOALS & RESULTS (CONT.)

Indicative Results:

- FY10 TRIF related Bio and Health, Capacity Building and Established initiative projects generated \$65.2M of federal and non-federal awards.
- The \$100M/10-year Army Flexible Display Center received an additional \$4M for procurement of a GenII OLED deposition tool which will be used for making full color high resolution displays.
- Several research grants were awarded in FY10 in areas seeded by TRIF funds. Notable awards include a total of \$10M from the newly created Department of Energy (DoE) Advanced Research Projects Agency-Energy. The first project will focus on the development of high-energy metal-air batteries that promise to provide low-cost, long-range power for vehicles. The second project will investigate the use of photosynthetic bacteria to provide automotive fuel. ASU received an additional \$14M award from the DoE to establish a bio-inspired solar fuel Energy Frontier Research Center. A \$25M award was granted for a joint ASU, APS, City of Phoenix project to transform the light rail corridor in Phoenix into a model of energy consciousness and efficiency.
- The recruitment of Dr. Joshua LaBaer to direct Biodesign's Virginia G. Piper Center for Personalized Diagnostics and appointment of Nobel Laureate Dr. Lee Hartwell as Chief Scientist of Biodesign's Center for Sustainable Health.

MANAGEMENT

OFFICE OF KNOWLEDGE ENTERPRISE DEVELOPMENT

R.F. "Rick" Shangraw: Senior Vice President

Sethuraman Panchanathan: Deputy Vice President, University Chief Research Officer

ADVISORY BOARDS

Each of the investment areas (with the current exception of the Biodesign Institute) 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. The Biodesign Institute is currently in the process of re-forming its external advisory board which will be in place in FY11.

LEARN MORE

Office of Knowledge Enterprise Development

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



ARIZONA STATE UNIVERSITY TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)



The Biodesign Institute is ASU's flagship TRIF initiative. It represents the State's largest research infrastructure investment in biosciences, a vast expansion of ASU's state-of-the-art research capacity, and serves a core mission to engage the talents of its multidisciplinary scientists to find solutions to some of society's largest challenges. At the Biodesign Institute, we assemble large, scientifically diverse teams to galvanize great ideas into real-world solutions. We fuse the talents of nearly 700 faculty, staff, students and collaborators whose expertise spans engineering, the biosciences, medicine, computing, economics, public policy and management. This allows us to consider the scalability, affordability and societal implications of the solutions we pursue.



The hundreds of researchers at the Biodesign Institute are driven by a passion to spur scientific breakthroughs centered on three use-inspired research pillars: improving health, protecting lives and sustaining our planet. The Biodesign Institute has made significant progress in each of these three use-inspired research pillars, becoming a significant focal point for discovery, innovation and economic development for Arizona.



Our results-driven approach makes it possible for students to have a real impact on the world. We help launch the careers of postdoctoral researchers, and we provide rigorous training for graduate students, research experiences for undergraduates, and laboratory internships for high school students. At any given time, more than 200 students are engaged in our labs, contributing to discovery and innovation.



To accelerate commercial translation of research breakthroughs, we have created the Biodesign Impact Accelerator. This new translational paradigm bridges critical gaps that often impede the progress of valuable innovations. It nurtures technologies through key stages of development and moves them into the private sector once they are viable.

REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2010

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Dr. Alan Nelson
Executive Director
The Biodesign Institute



Performance Analysis

Bio and Health PERFORMANCE MEASURES/IMPACT	FY10	FY10	FY11
	Proj	Actual	Proj
Return on Investment (\$ amounts in millions)			
Federal and non-federal awards	58.80	65.20	65.00
Royalty income	0.00	0.09	0.00
Foundation funding	0.50	15.60	0.50
Return Total	59.30	80.89	65.50
Technology Transfer (All ASU)			
New invention disclosures	150	187	151
New patent applications filed	160	232	162
New patents issued	21	44	21
Total start-up companies licensing ASU technology	4	4	4
Licenses or options signed (as indication of technology adoption by industry)	33	46	34
Work Force Contributions			
Post-doctoral appointments	81	50	93
Post-doctoral researchers leaving to enter the workforce	12	25	13
Graduate students employed		152	278
Graduate students earning degrees and entering the workforce	45	38	47
Undergraduate students involved	214	113	225
Partnerships/Collaborations			
The number of research grants/contracts involving funding from non-government entities	35	41	39
The number of research grants/contracts involving subcontracts to non-ASU researchers	6	14	8

DISCUSSION OF PERFORMANCE

The Biodesign Institute has met or exceeded all of the business goals set in mid-2003 and endorsed by the Arizona Board of Regents and provided a significant return on TRIF investment. Biodesign has attracted more than \$350 million in external funding since inception, including competitive grant awards and support from philanthropic sources. During FY 2010, the Institute won the State's 2009 Excellence in Economic Development Award in the category of Innovative Economic Development. With more than 500 new scientific findings documented in peer-reviewed journals over the past six years, the research community at Biodesign is both dynamic and innovative.

Return on Investment

The Biodesign Institute researchers generated significant proposal activity, with nearly \$300 million in proposals advanced in the past FY2010 alone. This ensures a strong leveraging of TRIF investment. Increased with opportunities from the American Recovery and Reinvestment Act of 2009, (the 'stimulus package'), and our strong track record of securing competitively-awarded research grants, FY2010 was the most successful federal and non-federal award year to date, with \$63 million generated from Biodesign researchers. Federal awards remain our single largest source of funding, and diversifying our award portfolio is a long-term strategy for success. In FY11, our projections are a slight downturn in federal and non-federal awards, due to factors such as the expiration of stimulus funding and uncertainty in funding streams driven by a challenging economic environment.

Technology Transfer

Biodesign continues to be an ASU focal point for translational research with the formation of the Biodesign Impact Accelerator in FY10. In FY10, Biodesign researchers continued their high-level of technology transfer activity with record levels of output for disclosures and patent applications. The Impact Accelerator will enhance the intellectual property and innovation pipeline by providing a risk-reduction strategy to start-up/spinout efforts of the Institute.

Students Trained/Workforce Development

The Biodesign Institute is a beacon for high school, undergraduate, graduate and postdoctoral education and bioscience training, providing workforce development in high-paying jobs for the State. Despite economic uncertainty, Biodesign provided a training pipeline for more than 60 postdocs and graduate students to enter the workforce in FY10. The Institute also provides undergraduate research opportunities and public outreach through its High School Internship program.

Partnerships/Collaborations

An important component for growth of the Biodesign Institute and capacity building project initiatives are collaborations, partnerships, and strategic alliances with some of the world's leading institutions. Increasing involvement with non-ASU researchers such as the Mayo Clinic, TGen, Barrow Neurological Institute, and others provides additional opportunities to expand and enhance ASU research.

Biodesign Research Model

The Biodesign Institute is a highly collaborative environment in which dozens of faculty and their laboratories have come together to form centers that, in turn, work together on large societal problems. Our 10 research centers represent collections of skills, capabilities, and areas of emphasis with a high affinity for being grouped into a center. But, the real value of our approach is that we are able to leverage our centers in a highly collaborative, team-oriented, synergistic manner. Our research projects may involve many different centers working together to solve a complex problem affecting human health and the environment. Often, our projects are launched within one center, and--as more insight is gained--other centers are engaged to address identified needs.

Research Centers

The Center for Bioelectronics and Biosensors develops technologies that are sensitive and selective in detecting chemicals in an individual or the environment that have been identified as concerns. **Director: Nongjian Tao, PhD**

The Center for BioEnergetics improves diagnosis and treatment of illness caused by impaired energy metabolism. These metabolic diseases have association with debilitating childhood diseases plus heart, liver and kidney disease, diabetes and dementia. **Director: Sidney Hecht, PhD**

The Center for Biosignatures Discovery Automation identifies sources of unhealthy cell function and its links to genomics or other factors. Understanding the cascade of effects in disease enables better diagnostics and cures. **Director: Deirdre Meldrum, PhD**

The Center for Environmental Biotechnology develops microbiological systems to capture or develop renewable resources that prevent or clean up environmental pollution. **Director: Bruce Rittmann, PhD, NAE**

The Center for Evolutionary Medicine and Informatics uses the power of computing to predict consequences of

genetic variations in populations and individuals in order to ease suffering or treat disease. **Director: Sudhir Kumar, PhD**

The Center for Innovations in Medicine develops medical diagnostics and systems to prevent disease. Major programs include using a system to monitor the immune system as an early warning mechanism of disease onset. **Director: Stephen Johnston, PhD**

The Center for Infectious Disease and Vaccinology seeks to prevent the spread and impact of infectious diseases through the development of safe, low cost vaccines and more rapid production of vaccines. **Director: Roy Curtiss, III, PhD, NAS**

The Virginia G. Piper Center for Personalized Diagnostics leverages proteomic science to diagnose diseases earlier and more accurately and provide every patient with the best treatment based on their genetic makeup and the specific disease subtype. **Director: Joshua LaBaer, MD, PhD**

The Center for Single Molecule Biophysics develops methods and invents new tools to understand and harness the power of individual molecules in living cells to promote health or combat disease and for applications including alternative energy. **Director: Stuart Lindsay, PhD**

The Center for Sustainable Health focuses on integrating potential technical advances with health policy and education to improve health outcomes while reducing costs.

Chief Scientist: Nobel laureate Lee Hartwell, PhD
Director: Michael Birt, PhD

Molecular Biosignatures Laboratory is focused on the development of systems to identify the subtypes of diseases like diabetes and cardiovascular disease more accurately. **Director: Randall Nelson, PhD**

The Lung Cancer Initiative is a newly launched effort focused on earlier diagnosis of lung cancer through screening technologies. **Directors: Claudia Henschke, MD, PhD and David Yankelevitz, MD**

Financial Information

Bio and Health	FY10	FY10	FY11
	Rev Budget	Actual	Rev Budget
REVENUE			
Carry Forward	\$ 2,049,900	\$ 1,818,700	\$ 790,600
New TRIF Revenue	16,244,500	15,510,200	15,719,800
TOTAL REVENUE	\$18,294,400	\$17,328,900	\$16,510,400
OPERATING BUDGET			
Personal Services	7,692,700	7,605,700	6,537,100
Employee Related Expenses	1,810,000	2,438,400	2,095,800
Operating Expenses	5,581,000	5,319,300	4,572,000
Total Operating Budget	\$15,083,700	\$15,363,400	\$13,204,900
CAPITAL BUDGET			
Building Renovation	2,210,700		2,305,500
Debt Service	1,000,000	1,175,000	1,000,000
Total Capital Budget	3,210,700	1,175,000	3,305,500
TOTAL EXPENDITURES	\$18,294,400	\$16,538,400	\$16,510,400
Return On Investment	3.2:1	4.9:1	4.0:1

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

Goals & Results

ASU has strategically invested its TRIF allocation to ensure the critical mass and focus needed to produce the results identified by ABOR. The Biodesign Institute is the cornerstone of this strategy, so the goals & results below focus on this effort. However, the financial and performance metrics in this report also include Established and Capacity Building projects benefitting from TRIF.

Goals

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

Indicative Results—In FY10, the Biodesign Institute:

- Engaged a workforce exceeding 500 people, including 59 faculty, 120 researchers, 53 technicians, 176 students (variable) and 95 operational / support staff.
- Posted \$63 million in research awards: a \$32.8 million increase (94.5%) over the prior year. Non-federal partners accounted for 32.5% and federal agencies accounted for 67.4% of total awards.
- Exceeded \$290 million in new research contract proposals, an ASU record second only to last years' record of \$390 million.
- Recorded >60 invention disclosures, which is the highest level in five years and demonstrates an ability to expand the innovation pipeline.
- Introduced the Biodesign Impact Accelerator program, a first-of-its-kind initiative, aimed at accelerating the commercial translation of scientific innovations and technologies generated at ASU.

Key FY10 Appointments

- Dr. Joshua LaBaer took his post directing Biodesign's Virginia G. Piper Center for Personalized Diagnostics in the summer of '09, and has since received contract and grant awards totaling \$15.0 million. His team is focused on discovery and validation of unique molecular fingerprints of disease (biomarkers), which can provide early warning for cancer, diabetes and other conditions.
- Nobel Laureate Dr. Lee Hartwell was recruited as Chief Scientist of Biodesign's Center for Sustainable Health, which addresses core issues impeding better health outcomes at a lower cost, including social and policy barriers and lack of uniform metrics. The Center is directed by policy expert Dr. Michael Birt.
- Biodesign became home to the International Early Lung Cancer Action Program, or I-ELCAP, the world's largest ongoing study of CT scanning for lung cancer with 56 sites across 26 states and in 8 other countries.

Biodesign Select Research Highlights

- Created a graphene transistor composed of 13 benzene rings and new imaging technology to significantly improve the detection of trace chemicals important in such areas as national security, human health and the environment. —*Nature Communications*
- Biodesign secured a 5-year contract with the U.S. Department of Health and Human Services to lead an anticipated \$40.8 million, multi-institution research program to develop systems to rapidly measure an individual's level of exposure to radiation in the event of a radiological or nuclear incident.
- Biodesign researchers pioneered a method for taking a 'snapshot' of a person's immune system, paving the way for simple, inexpensive tests that could be used frequently enough to detect disease at the earliest possible stage, before symptoms appear. —*Vaccine*
- Biodesign was part of a multi-institution team that programmed a molecular robot made of DNA to maneuver along a DNA track. Potential applications include molecular robots that identify and destroy cancer cells or could assemble nanoscale electrical components. —*Nature*
- A vaccine candidate against newborn pneumonia developed at Biodesign with funding from Bill & Melinda Gates Foundation entered human clinical trials.
- Biodesign researchers developed a treatment demonstrated to halt infection against West Nile virus.

—*The Proceedings of the National Academy of Sciences*

Management

Office of Knowledge Enterprise Development

R. F. "Rick" Shangraw: Senior Vice President
Sethuraman Panchanathan: Deputy Vice President and University Chief Research Officer

(480) 965-1225
 ovprea.asu.edu

The Biodesign Institute

Alan Nelson: Executive Director
Lee Cheatham: Deputy Director
Neal Woodbury: Chief Scientific Officer
 (480) 727-0370
 www.biodesign.asu.edu

Advisory Board

The Biodesign Institute is in the process of re-establishing its External Advisory Board, a task that will be completed during FY11.

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.



ARIZONA STATE UNIVERSITY

SUSTAINABILITY AND RENEWABLE ENERGY 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 the 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 of the 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. http://www.seriousproductions.net/decision_theater/azsmart.pdf
- **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, 2010

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R.F. "Rick" Shangraw, Jr.
Director,
Global Institute of Sustainability



PERFORMANCE ANALYSIS

Sustainability and Renewable Energy PERFORMANCE MEASURES/IMPACT	FY10	FY10	FY11
	Proj	Actual	Proj
Return on Investment (\$ amounts in millions)			
Federal and non-federal awards	32.20	26.90	40.00
Royalty income	0.10	0.85	0.30
Foundation funding	1.50	0.88	2.50
Return Total	33.80	28.63	42.80
Work Force Contributions			
Post-doctoral appointments	29	15	35
Post-doctoral researchers leaving to enter the workforce	13	1	18
Graduate students employed	114	83	142
Graduate students earning degrees and entering the workforce	43	20	60
Undergraduate students involved	77	11	87
Partnerships/Collaborations			
The number of research grants/contracts involving funding from non-government entities	24	12	33
The number of research grants/contracts involving subcontracts to non-ASU researchers	21	0	27

DISCUSSION OF PERFORMANCE

Return on Investment

Sustainability and Renewable Energy proposal activity has continually increased with the opportunities from the American Recovery and Reinvestment Act of 2009 (aka the "stimulus package"), continued recruitment of new faculty, and the development of new programs. In FY10 investigators and affiliated faculty conducting Sustainability and Renewable Energy research secured nearly \$27M in sponsored research funding (marginally lower than FY10 projections) and with several solar energy proposals advancing past the pre-proposal stage, we anticipate a return of approximately \$40M dollars in FY11.

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 through university-government partnerships such as "Energize Phoenix"; 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; and the development and transfer of new technologies to the private sector that continues to expand.

Students Trained

Due to uncertain funding streams driven by a challenging economic environment, workforce contributions, in particular graduate and undergraduate involvement fell short of FY10 projections. However, with economic recovery on the horizon and sustained proposal activities in FY11, the number of students prepared for the new "green economy", through involvement in the initiative, will grow. In FY11, approximately 140 graduate and 90 undergraduate students will be involved in initiative research, and a projected 60 graduate students will earn degrees and enter the workforce. New interdisciplinary curricula in the School of Sustainability will offer degrees to educate and prepare citizens for the renewable energy society.

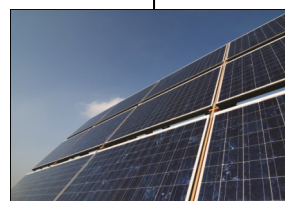
Partnerships/Collaborations

The number of partnerships and collaborations through the Sustainability and Renewable Energy Initiative continues to expand. This is reflected in the increasing number of research grants and contracts involving funding from non-governmental agencies. The collaborative effort between GIOS and the City of Phoenix to promote a more sustainable Phoenix, illustrated by the funding of \$25 million for a collaborative project on energy efficiency along the light rail corridor is one example of such partnerships. 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. Through the Sustainability and Renewable Energy Initiative, ASU has received funding from American Recovery and Reinvestment Act of 2009 (aka the “stimulus package”) to both create “green jobs” and reduce U.S. dependence on limited and vulnerable foreign sources of energy. The TRIF investment in sustainability research at ASU has allowed the State of Arizona to 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 sustainability talent, and abundance of sunshine (the highest of all the states with a resource potential of 7.5 kWh/m² 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, students work on applications for business, technology, and policy innovations related to climate change and energy.

ASU’s solar portfolio is the largest on a single U.S. university campus.

FINANCIALS

Sustainability and Renewable Energy	FY10	FY10	FY11
	Rev Budget	Actual	Rev Budget
REVENUE			
Carry Forward		\$ 231,200	\$ 16,100
New TRIF Revenue	1,900,000	1,873,300	1,400,000
TOTAL REVENUE	\$1,900,000	\$2,104,500	\$1,416,100
OPERATING BUDGET			
Personal Services	775,200	552,000	300,300
Employee Related Expenses	182,400	178,000	96,800
Operating Expenses	562,400	1,358,400	739,000
Total Operating Budget	\$1,520,000	\$2,088,400	\$1,136,100
CAPITAL BUDGET			
Building Renovation	380,000		280,000
Debt Service			
Total Capital Budget	380,000	-	280,000
TOTAL EXPENDITURES	\$1,900,000	\$2,088,400	\$1,416,100
Return On Investment	17.8:1	13.7:1	30.2:1

GOALS AND RESULTS

With support from TRIF and other sources of investment, ASU has developed a robust research program in sustainability and renewable energy. 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 FY11 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, and serve as a key resource in decision making about the future of solar energy infrastructure in Arizona.
- Advance partnerships with corporate and government stakeholders to implement sustainability strategies and approaches developed at ASU into practice.
- Receive \$26M in FY11 grants/contracts for renewable energy research, \$1.5M in FY11 for research on sustainability decision making, and \$10M in FY11 on broadly interdisciplinary sustainability research.
- Be awarded one large scale (\$5M-\$20M) sustainability science research project in water management, energy efficiency, climate change, or rapid urbanization.

Indicative Results through June 30, 2010:

- Ongoing, multi-year research awards currently include the Central Arizona-Phoenix Long-Term Ecological Research (\$5M over 6 years, NSF), Designer Organisms for Biohydrogen Production (\$10M, private donor), Conservation in a Social Context (\$2M over 5 years, MacArthur Foundation).
- GIOS researchers were awarded a renewal of the Decision Center for a Desert City project investigating how stakeholders make decisions about water resources in the face of uncertainty (\$7.5M over 5 years, NSF).
- GIOS, the City of Phoenix and Arizona Public Service collaborated on a \$25M project to transform the light rail corridor in Phoenix into a model of energy consciousness and efficiency. Funded under the Energy Efficiency Conservation Block Grant program at DOE with ARRA funding, the project will focus on financial mechanisms to spur energy efficiency retrofits, real-time feedback and education to consumers to change energy behaviors, and a community-based marketing campaign with the goal of saving 30% of residential energy consumption and 18% of commercial energy consumption.
- The DT has provided decision science workshops on the available avenues for Arizona to advance as the nexus of solar energy production to key stakeholders including Arizona Public Service Company, Salt River Project, Tucson Electric Power Company, Science Foundation Arizona, Brightsource, ViaSol and the Under Secretary of Energy Kristina Johnson.
- DT and the Sandra Day O'Connor College of Law at Arizona State University were awarded a grant from the Robert Wood Johnson Foundation to examine the types of legal decisions that must be made rapidly during public health emergencies and the science behind those decisions. This grant allowed DT researchers to apply the innovative decision making research methods developed at DT to understand how key decision makers can make the best informed decisions during times of crisis.

MANAGEMENT

OFFICE OF KNOWLEDGE ENTERPRISE DEVELOPMENT

R.F. "Rick" Shangraw: Senior Vice President

Sethuraman Panchanathan: Deputy Vice President, University Chief Research Officer

GLOBAL INSTITUTE OF SUSTAINABILITY

R.F. "Rick" Shangraw, Jr.: Director

Sander van der Leeuw: Dean, School of Sustainability

Rob Melnick: Executive Dean, School of Sustainability

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- **Tim Albinson** — CEO, Aravo Solutions, Inc.
- **Ray Anderson** — CEO, Interface Global
- **David Butterfield** — President, Trust for Sustainable Development
- **Brad Casper** — President and CEO, The Dial Corporation
- **William Clark** — Harvey Brooks Professor, International Science, Public Policy, Human Development, Harvard University
- **Sue Clark-Johnson** — President, Gannett Newspaper Division (Retired); Executive Director, Morrison Institute for Public Policy, Arizona State University
- **Craig Cogut** — Co-Managing Partner/Founder, Pegasus Capital Advisors
- **Michael Crow** — President, Arizona State University
- **Gary Dirks** — President, BP Asia Pacific and BP China (Retired); Director, ASU LightWorks
- **Curtis Frasier** — General Counsel, Upstream Americas, Shell Gas & Power
- **Robert Kates** — Senior Research Associate, Harvard University
- **Julia Marton-Lefevre** — Director General, International Union for Conservation of Nature
- **Pamela Matson** — Dean, School of Earth Sciences, Stanford University
- **William McDonough** — Founding Partner, William McDonough + Partners
- **Anthony Michaels** — Managing Director, Proteus Environmental Technologies, LLC
- **Bill Post** — Chairman of the Board and CEO, Pinnacle West Capital Corporation (Retired)
- **Brian Swette** — Chairman of the Board, Burger King
- **Sir Crispin Tickell** — Director, Policy Foresight Programme, James Martin 21st Century School, University of Oxford
- **John Underwood** — Managing Director, Goldman Sachs
- **Sander van der Leeuw** — Dean, School of Sustainability; Director and Professor, School of Human Evolution and Social Change, Arizona State University
- **S. Robson "Rob" Walton** — Chairman of the Board, Walmart
- **Julie Ann Wrigley** — President and CEO, Wrigley Investments, LLC

LEARN MORE

Office of Knowledge Enterprise Development

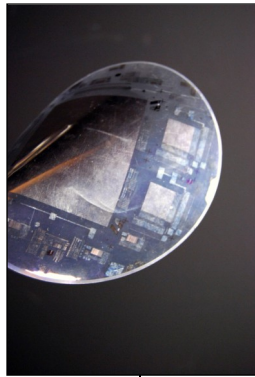
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ARIZONA STATE UNIVERSITY TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

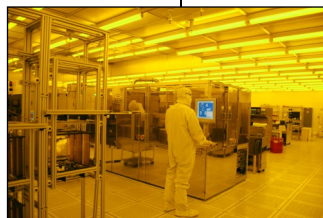


ADVANCED MATERIALS AND FLEXIBLE SYSTEMS INITIATIVE

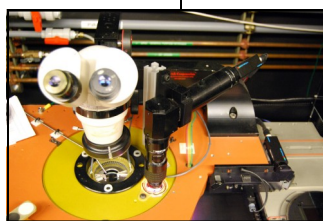
The goal of the Advanced Material and Flexible Systems (AMFS) initiative is to drive technological advances in the areas of nanoelectronics, sensor development, materials characterization and flexible electronics. Examples of applications for these technologies include sensing arrays, unattended ground sensors, 'smart medical bandages', flexible antennas, and flexible identification tags that allow for individuals of interest to be tagged, tracked and located.



Building our research capacity in these areas will allow us a greater level of participation in and return from a market that is expected to experience significant growth in the coming years. According to IdTechEx, the market for flexible electronics, beyond displays, is expected to grow from approximately \$1 billion in 2010 to \$33 billion in 2020.



The AMFS initiative supports research and development efforts underway at the Flexible Display Center (FDC), the Adaptive Intelligent Materials and Systems Center (AIMS) and the Center for Engineered Materials (CEMAT). In FY10, the Applied NanoBioscience Center (ANBC) was slated to receive TRIF funds. However, in FY10 the lead principal investigator for ANBC relocated to the University of Arizona College of Medicine-Phoenix. The funds originally designated for ANBC were, therefore, reinvested in expanding the Flexible Electronic Systems Initiative through the acquisition of the next generation OLED deposition tool and planning for the establishment an NSF Engineering Research Center on Flexible Systems.



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

The research activities associated with the AMFS initiative has resulted in strong partnerships with industry, successful implementation of a flexible electronics Pilot Line which enabled delivery of flexible displays and electronic device demonstrators to partners and military integrators, as well as double the anticipated number of graduate students trained. Going forward the AMFS Initiative will focus on advancing Flexible Electronic Systems with applications in renewable energy and biomedicine.

SUMMARY REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 2010

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Dr. Nick Colaneri
Director, Flexible Display Center



PERFORMANCE ANALYSIS

Advanced Materials and Flexible Systems PERFORMANCE MEASURES/IMPACT	FY10	FY10	FY11
	Proj	Actual	Proj
Return on Investment (\$ amounts in millions)			
Federal and non-federal awards	31.20	22.50	20.00
Royalty income	0.02	0.05	0.05
Foundation funding	0.04	0.00	0.04
Return Total	31.26	22.55	20.09
Work Force Contributions			
Post-doctoral appointments	20	1	23
Post-doctoral researchers leaving to enter the workforce	10	0	14
Graduate students employed	7	15	4
Graduate students earning degrees and entering the workforce	3	0	4
Undergraduate students involved	4	2	6
Partnerships/Collaborations			
The number of research grants/contracts involving funding from non-government entities	8	14	6
The number of research grants/contracts involving subcontracts to non-ASU researchers	3	2	5

DISCUSSION OF PERFORMANCE

Return on Investment

The core funding for FDC is a 10-year cooperative agreement award from the U.S. Army of \$93.7M with industrial members providing an additional \$20M million in in-kind and cash contributions over the 10-year agreement. In addition the Army Research Labs provided an additional \$4M for procurement of a GenII OLED deposition tool which will be used for making full color high resolution flexible displays. The Sunic GenII OLED deposition system is capable of producing active-matrix full color, flexible OLED displays, as well as the capability to produce other organic based devices such as OLED solid state lighting elements, and organic photo-voltaic cells. FY10 also represented the last year of TRIF funding for AIMS and CEMAT. TRIF funds allowed these centers to secure nearly \$9M in sponsored research funding, as well as support graduate and undergraduate student training. All FY10 ANBC associated research activities were transferred to the Biodesign Institute. We have revised our FY11 estimates downward due to completion of investments in AIMS, CEMAT and ANBC.

Economic Impact

As demonstrated by companies that collocated in the Macro-Technology Works (MTW) Facility and the recent spin-out companies, AMFS has potential to provide significant competitive advantage for Arizona and AMFS partners. EVG, who is a charter member of the FDC, is collocated in the MTW building and has collaborated with the FDC on novel processing technology and bond/debond technology. Due to the proximity and close collaboration with the FDC, EVG has

been able to successfully commercialize process tool technology that was developed in the MTW building and has grown to nearly 40 FT employees.

Students Trained

Currently, the FDC collaborates with more than 6 full time faculty from various ASU units, including the School of Electrical, Computer and Energy Engineering, the Department of Physics, and the School for Engineering of Matter, Transport and Energy. As part of these engagements, undergraduates, graduate students and post-docs have the opportunity gain practical experience in the field. In addition, the FDC employees 4 full-time engineers that are concurrently pursuing their graduate degrees. One of the key aims of the proposed Engineering Research Center (ERC) in Flexible Systems includes the education and preparation of creative, innovative engineers to develop systems that promise to create market value, while addressing real societal needs, and minimizing impact on the environment.

Partnerships/Collaborations

Partnerships and collaborative relationships serve a critical role in the success of the Advanced Materials and Flexible Systems initiative. The FDC has a proven collaborative partnership model with 28 engaged industry members (33% Arizona-based), 8 university members and strategic alliances with the FlexTech Alliance and the Center for Advanced Microelectronics.

The AMFS multi-partnership business model and bench-to-manufacturing operational model coupled with unique and synergistic research infrastructure, positions the AMFS to be a national leader in the flexible electronics industry. The MTW Facility, home to the AMFS research centers, was designed as a organizational mechanism that allows ASU to engage in translational research and economic development activities that aim to advance the concept of flexible electronics for a variety of government and industrial applications. With the completion of investments in AIMS and CEMAT, research activities under the AMFS initiative will focus primarily on Flexible Electronic Systems development and applications.

Flexible Electronics Pilot Line Fabrication

The FDC, initiated in February 2004 under a cooperative agreement with the U.S. Army, has successfully implemented a flexible electronics Pilot Line on 6" (150 mm) scale, which has delivered working flexible displays to partners and military integrators. FDC has worked to overcome many of the hurdles to manufacturing flexible displays including process development, supply chain development, flexible substrate system and handling issues, as well as novel materials technology. The solutions FDC has developed thus far have enabled a robust manufacturing process for flexible displays and electronics. This process is now being scaled up for a GenII Pilot Line: GEN II (370 mm x 470 mm) Pilot Line for Low Volume Production (3 micron feature size (L/S)).

Capabilities also being developed in printed electronics capabilities and pilot-line level organic light emitting diode (OLED) integration and should be augmented further by the recent pur-

chase of a Sunic GenII OLED deposition system. The system is capable of producing active-matrix full color, flexible OLED displays, as well as other organic based devices such as OLED solid state lighting elements, and organic photo-voltaic cells. The tool has been ordered and is on scheduled to arrive at ASU later this calendar year.

Flexible Integrated Sensory Systems

The aim of this research is to realize the potential of flexible electronics as a transformative tool for a broad range of new industries, including healthcare, safety, security, human performance, and sustainability. Potential new products include smart bandages that conform to the contours of a patient's body, monitor and prevent infection, deliver medications, and communicate with clinicians; large-scale skins integrated into bridges, buildings, ships, and aircraft to measure strain throughout the structure and allow for dynamic load redistribution; lightweight, low-power, wearable devices that can monitor physiological condition or human performance and communicate with the wearer via tactile feedback.

Technology Demonstrators and Technology Transition

In order to increase the user demand for the technology it is critical to demonstrate its application in real world scenarios. Considerable capability exists to develop hardware to demonstrate newly developed technologies. AzTE is a resource that is used to facilitated the transition process.

FINANCIALS

Advanced Materials and Flexible Systems	FY10	FY10	FY11
	Rev Budget	Actual	Rev Budget
REVENUE			
Carry Forward			\$ -
New TRIF Revenue	400,000	163,500	600,000
TOTAL REVENUE	\$400,000	\$163,500	\$600,000
OPERATING BUDGET			
Personal Services	163,200	78,100	229,400
Employee Related Expenses	38,400	34,400	101,000
Operating Expenses	118,400	51,000	149,600
Total Operating Budget	\$320,000	\$163,500	\$480,000
CAPITAL BUDGET			
Building Renovation	80,000		120,000
Debt Service			
Total Capital Budget	80,000	-	120,000
TOTAL EXPENDITURES	\$400,000	\$163,500	\$600,000
Return On Investment	78.2:1	137.9:1	33.5:1

GOALS & RESULTS

Goals:

- 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.
- Develop a robust research engine to strategically address emerging flexible electronics opportunities and to accelerate technology transition opportunities.
- Increase interaction and collaboration with the Academic Research Community within ASU (and others) to elucidate promising new areas for research/development and stay at the forefront of emerging flexible electronics technology.
- Take basic technologies from R&D labs and work to develop robust manufacturable process technology for novel flexible electronic devices.
- Engage in Technology Transition: Develop manufacturable technologies/IP that will be transitioned to manufacturing partners. License IP developed at ASU.
- Leverage the infrastructure we have built for flexible display processing for other synergistic emerging applications in renewable energy and biomedicine.

Results and Updates:

- The \$100M/10-year Army FDC received an additional \$4M for procurement of a GenII OLED deposition tool which will be used for making full color high resolution displays.
- In FY10 research activities conducted at the FDC resulted in 12 invention disclosures.
- In December 2009, ASU was selected to lead a \$40M/5 year multi-institutional research program to develop systems that would rapidly measure an individual's level of exposure to radiation, sponsored by DHHS' Biomedical Advanced Research and Development Authority (BARDA).
- Research activities carried out in AIMS and CEMAT generated nearly \$9M in federal awards.
- An NSF Engineering Research Center proposal in Flexible Systems submitted by Dr. Gregory Raupp has been invited for a site visit.
- Process solutions developed at FDC have been licensed to one industrial member, and negotiations with several other manufacturers is in progress.
- In FY10, AMFS-affiliated centers and institutes hosted a number of research meetings and workshops, including 1) the quarterly FlexTech Alliance workshop, 2) a DoD Tri-services Workshop on *Roadmap for Transitioning SHM Technology to Military Platforms* hosted by AIMS.

MANAGEMENT

OFFICE OF ENTERPRISE KNOWLEDGE DEVELOPMENT

R.F. "Rick" Shangraw: Senior Vice President

Sethuraman "Panch" Panchanathan: Deputy Vice President and University Chief Research Officer

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

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

LEARN MORE

Office of Knowledge Enterprise Development

480.965.1225

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



ARIZONA STATE UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
ASUP CERTIFICATES OF PARTICIPATION (COPs)

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE					
Carryforward	\$ (5,000)	\$ 76,900	\$ (5,100)	\$ (5,100)	\$ -
TRIF Revenue	2,128,000	2,005,900	2,084,200	2,088,900	2,081,600
TOTAL REVENUE	\$ 2,123,000	\$ 2,082,800	\$ 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	2,046,100	2,082,800	2,084,200	2,083,800	2,081,600
TOTAL CAPITAL BUDGET	2,046,100	2,082,800	2,084,200	2,083,800	2,081,600
EXPENDITURES GRAND TOTAL	\$ 2,046,100	\$ 2,082,800	\$ 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 2010 ACTUAL / FY 2011 BUDGET
ASUW CERTIFICATES OF PARTICIPATION (COPs)

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE					
Carryforward	(3,600)	63,900	26,500	26,500	(3,000)
TRIF Revenue	1,671,600	1,605,100	1,634,600	1,604,500	1,636,100
TOTAL REVENUE	\$ 1,668,000	\$ 1,669,000	\$ 1,661,100	\$ 1,631,000	\$ 1,633,100
EXPENDITURES					
OPERATING BUDGET					
Personal Services					
ERE					
All Other Operating	-	-	-	-	-
TOTAL OPERATING BUDGET	-	-	-	-	-
CAPITAL BUDGET					
Building Renovation					
Debt Service					
COPs Lease Purchase Payment	1,604,100	1,639,000	1,634,600	1,634,000	1,637,000
TOTAL CAPITAL BUDGET	1,604,100	1,639,000	1,634,600	1,634,000	1,637,000
EXPENDITURES GRAND TOTAL	\$ 1,604,100	\$ 1,639,000	\$ 1,634,600	\$ 1,634,000	\$ 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.

NORTHERN ARIZONA UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGETS

SUMMARY

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE						
Carryforward	\$ 13,264,390	\$ 10,185,985	\$ 10,403,784	\$ 8,428,680	\$ 8,488,685	\$ 6,372,211
TRIF Revenue	14,612,967	15,159,929	12,257,111	11,516,654	10,912,973	11,004,529
TOTAL REVENUE	\$ 27,877,357	\$ 25,345,914	\$ 22,660,895	\$ 19,945,334	\$ 19,401,658	\$ 17,376,740
EXPENDITURES						
OPERATING BUDGET						
Personal Services	\$ 6,413,799	\$ 6,369,866	\$ 6,358,863	\$ 7,722,413	\$ 6,412,432	\$ 7,919,800
ERE	1,820,063	1,983,389	2,017,378	2,335,645	2,128,501	2,365,000
All Other Operating	3,558,889	5,178,681	3,792,045	7,783,890	2,903,607	4,741,940
TOTAL OPERATING BUDGET	11,792,751	13,531,936	12,168,286	17,841,948	11,444,540	15,026,740
CAPITAL BUDGET						
Building Renovation	-	500,000	-	-	684,907	1,300,000
Debt Service	3,091,339	796,179	2,003,924	2,103,386	900,000	1,050,000
Conf Center/New Construction Support	4,071,491	162,830	-	-	-	-
TOTAL CAPITAL BUDGET	7,162,830	1,459,009	2,003,924	2,103,386	1,584,907	2,350,000
EXPENDITURES GRAND TOTAL	\$ 18,955,581	\$ 14,990,945	\$ 14,172,210	\$ 19,945,334	\$ 13,029,447	\$ 17,376,740
SUMMARY BY INITIATIVE						
Access and Workforce Development	\$ 5,556,985	\$ 3,415,637	\$ 2,219,276	\$ 2,652,416	\$ 1,934,243	\$ 2,685,425
Biotechnology	917,127	659,595	454,237	350,028	321,056	144,973
e-Learning	2,041,506	1,939,262	1,497,857	1,342,053	1,270,624	1,258,338
Environmental Sustainability	1,967,092	1,790,069	1,556,379	2,257,706	1,607,851	2,336,815
University Initiatives	2,904,282	931,349	2,492,682	5,583,941	1,794,307	6,165,339
AZUN	2,320,413	2,732,934	2,630,875	3,110,211	2,504,815	2,087,754
Healthcare Program Expansion	32,165	965,052	1,647,531	2,051,225	1,465,543	1,277,365
NAU Statewide Expansion	391,012	2,219,868	948,480	1,255,010	826,869	1,119,825
NAU-Yuma Expansion	-	500,000	545,911	954,090	954,089	-
Capital Projects	2,824,999	(162,821)	-	-	-	-
Healthy Forest	-	-	178,982	388,654	350,050	300,906
EXPENDITURES GRAND TOTAL	\$ 18,955,581	\$ 14,990,945	\$ 14,172,210	\$ 19,945,334	\$ 13,029,447	\$ 17,376,740

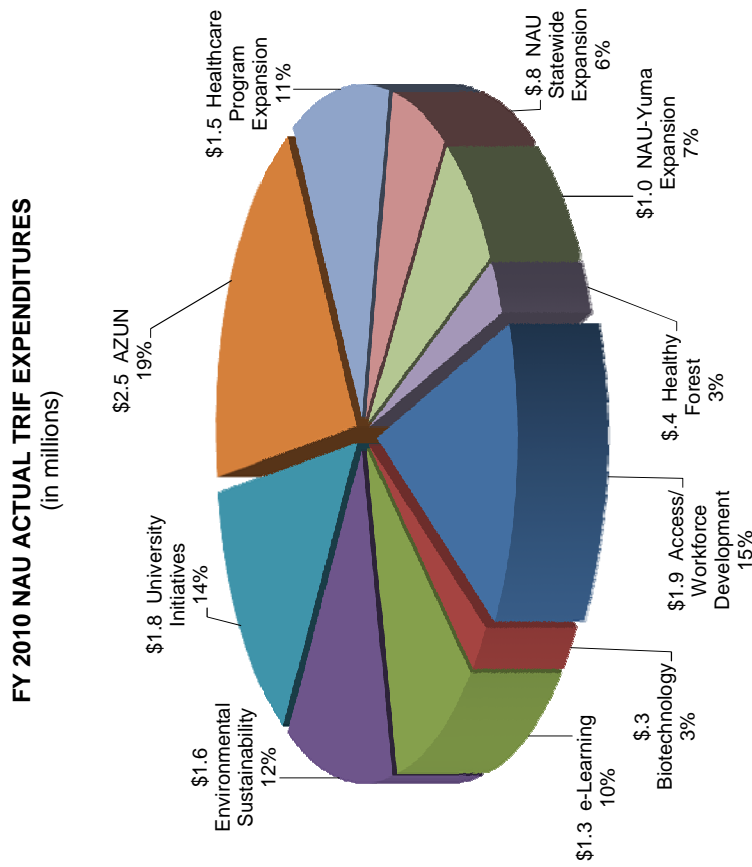
NORTHERN ARIZONA UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGETS
ARIZONA UNIVERSITIES NETWORK (AZUN) SUMMARY

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE						
Carryforward	\$ 3,115,813	\$ 2,938,105	\$ 2,311,806	\$ 1,451,707	\$ 1,451,708	\$ 518,461
TRIF Revenue	2,142,705	2,108,279	1,770,777	1,658,504	1,571,568	1,569,293
TOTAL REVENUE	\$ 5,258,518	\$ 5,046,384	\$ 4,082,583	\$ 3,110,211	\$ 3,023,276	\$ 2,087,754
EXPENDITURES						
OPERATING BUDGET						
Personal Services	\$ 721,011	\$ 888,896	\$ 924,311	\$ 1,026,674	\$ 865,771	\$ 925,000
ERE	236,840	306,859	327,815	354,428	301,245	340,000
All Other Operating	1,362,562	1,037,179	878,749	1,229,109	837,799	322,754
TOTAL OPERATING BUDGET	2,320,413	2,232,934	2,130,875	2,610,211	2,004,815	1,587,754
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	\$ 2,630,875	\$ 3,110,211	\$ 2,504,815	\$ 2,087,754

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 been extended through June 30, 2013.

NORTHERN ARIZONA UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA

	FY 2010 REVISED BUDGET	FY 2010 ACTUAL
REVENUE		
Carryforward	\$ 8,428,680	\$ 8,488,685
TRIF Revenue	11,516,654	10,912,973
TOTAL REVENUE	\$ 19,945,334	\$ 19,401,658
EXPENDITURES		
OPERATING BUDGET		
Personal Services	\$ 7,722,413	\$ 6,412,432
ERE	2,335,645	2,128,501
All Other Operating	7,783,890	2,903,607
TOTAL OPERATING BUDGET	17,841,948	11,444,540
CAPITAL BUDGET		
Building Renovation	-	684,907
Debt Service	2,103,386	900,000
Conf Center/New Construction Support	-	-
TOTAL CAPITAL BUDGET	2,103,386	1,584,907
EXPENDITURES GRAND TOTAL	\$ 19,945,334	\$ 13,029,447
SUMMARY BY INITIATIVE		
Access and Workforce Development	\$ 2,652,416	\$ 1,934,243
Biotechnology	350,028	321,056
e-Learning	1,342,053	1,270,624
Environmental Sustainability	2,257,706	1,607,851
AZUN	3,110,211	2,504,815
Healthcare Program Expansion	2,051,225	1,465,543
NAU Statewide Expansion	1,255,010	826,869
NAU-Yuma Expansion	954,090	954,089
Healthy Forest	388,654	350,050
University Initiatives	5,583,941	1,794,307
EXPENDITURES GRAND TOTAL	\$ 14,361,393	\$ 11,235,140



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TRIF PROGRAM



NORTHERN
ARIZONA
UNIVERSITY

September 1, 2010

THE NORTHERN ARIZONA UNIVERSITY TRIF PROGRAM

In the first 9 years of TRIF funding, from FY 2002 to FY 2010, 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 Forests** have allowed Northern Arizona University to invest in facilities and related projects 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 – a Physician Assistant program is scheduled to begin in Fall 2012 – to create an anchor facility in North Phoenix and to invest in NAU-Yuma. Through the Healthy Forests 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	FY08 Act	FY09 Act	FY 10 Act	FY 11 Proj
ROI	Leveraged dollars (\$M)	\$7.90	\$11.30	\$11.00	\$15.20	\$8.90	\$14.90	\$15.20	\$15.60	\$7.45	\$10.90
	ROI ratio	4.20 : 1	4.56 : 1	3.72 : 1	5.71 : 1	3.28 : 1	5.1 : 1	6.1:1	8.2:1	4.76 : 1	3.91 : 1
Publications / Conferences	Conferences Sponsored	14	19	21	28	26	21	42	2	4	20
	Presentations / Publications	133	180	197	373	166	286	3137 (inc. web)	126	81	220
Tech Transfer	Patent Applications / Patents Generated	2	2	2	1	3	2	5	2	1	6
	Products Generated and in the Marketplace	0	5	49	8	13	5	4	0	0	12
Economic Development	Business Expansions / Spinoffs / Creations	3	3	7	21	10	5	10	0	4	11
Workforce Contributions	Graduate / Postdoc Students Trained	116	149	162	60	67	58	137	61	36	100
	Undergrad Students Trained	106	205	106	93	135	119	175	57	68	195
	Continuing Education Professionals	85	312	1361	142	274	42	142	29	9	162
Specific Collaborations	Government / University collaborations	81	209	175	240	238	229	225	50	32	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	FY08 Act	FY09 Act	FY 10 Act	FY 11 Proj
New Students Served	New Teachers	250	542	807	679	773	804	1019	1,058	969	750
	Nurses / Health Professionals	120	266	414	464	540	721	640	680	715	600
	Business / Non-Profit Managers	44	182	303	442	528	673	725	816	924	500
	Number Degree / Certificate Programs	11	19	37	41	41	41	41	41	41	48
Enhanced Courses Developed	Web-IT / Enhanced Courses Developed	125	101	121	141	22	80	67	78	99	80
	Number Faculty Participating in Web Development	150	117	155	126	241	325	210	397	201	350
Student Course Involvement	Student Enrollments In Online Courses	7,110	9,476	10,133	12,381	14116	20,526	31,568	35,637	39,025	14,000
Partnerships	Number K-12 Partners (Schools / Districts)	30	51	119	127	127	127	126	125	125	140
	Higher Education Partnerships	17	19	20	20	22	22	23	23	23	20
	Private Sector Partnerships	2	21	42	77	80	80	85	89	100	62
Technology Transfer	Courses / Modules Sold / Brokered	0	5	0	0	0	0	0	0	0	1

PERFORMANCE ANALYSIS

As reflected on page one of this brochure, TRIF funds have enabled Northern Arizona University to make both one-time and ongoing investments in a number of initiatives of benefit to the Arizona economy. However, budget uncertainties in the past several years have constrained both planning and performance. In addition, FY11 is the final year of authorized funding for a number of significant efforts – Statewide expansion, Health-care expansion, and Healthy Forests, and decisions must be made about whether and how to transition these initiatives to alternate funding sources. The university is eager to begin planning for the 2012-2016 cycle, and is looking forward to Board direction in this effort.

FINANCIAL INFORMATION

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget	
GB/BERDENE	Carryforward	\$0	\$538,756	\$734,337	\$497,302	\$830,232	\$1,008,633	\$915,237	\$826,364	\$773,815	\$582,696
	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	\$1,737,788	\$1,899,092
	TOTAL REV	\$2,417,502	\$3,213,300	\$3,233,243	\$3,242,902	\$3,718,655	\$3,799,457	\$3,277,909	\$2,784,431	\$2,511,603	\$2,481,788
	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	\$1,351,623	\$2,275,000
	Other Operating	\$600,119	\$840,983	\$827,573	\$368,742	\$939,297	\$465,365	\$803,889	\$633,331	\$577,284	\$206,788
	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	\$1,928,907	\$2,481,788
AWD/E-LEARNING	Carryforward	\$0	\$2,164,798	\$2,711,282	\$2,263,265	\$2,776,537	\$1,680,175	\$1,050,709	\$414,780	\$465,506	\$604,622
	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	\$3,343,983	\$3,339,141
	TOTAL REV	\$5,135,129	\$7,043,097	\$8,374,100	\$7,190,538	\$7,960,123	\$8,649,200	\$5,773,175	\$4,182,639	\$3,809,489	\$3,943,763
	Personal Services	\$2,326,003	\$3,412,531	\$4,069,277	\$4,011,236	\$4,150,863	\$4,703,165	\$4,378,114	\$3,313,322	\$3,012,246	\$3,673,000
	Other Operating	\$644,328	\$919,284	\$1,836,743	\$942,881	\$2,129,085	\$823,835	\$976,785	\$403,811	\$192,621	\$270,763
	Capital	\$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	\$3,717,133	\$3,204,867	\$3,943,763	
UNIVERSITY INITIATIVES AND CAPITAL	Carry Forward	\$0	\$206,744	\$664,608	\$1,674,629	\$3,054,612	\$5,159,771	\$120,491	\$2,648,863	\$2,989,894	\$3,710,515
	New TRIF Revenue	\$298,203	\$590,810	\$938,517	\$2,552,961	\$1,764,371	\$690,001	\$3,239,528	\$2,833,713	\$2,514,928	\$2,454,824
	TOTAL REV	\$298,203	\$797,554	\$1,603,125	\$4,227,590	\$4,818,983	\$5,849,772	\$3,360,019	\$5,482,576	\$5,504,822	\$6,165,339
	Personal Services	\$36,174	\$72,666	\$62,927	\$266,070	\$340,462	\$153,992	\$219,028	\$428,828	\$430,408	\$1,591,800
	Other Operating	\$55,285	\$60,280	\$17,761	\$188,050	(\$681,250)	\$483,950	\$90,491	\$559,930	\$278,992	\$2,723,539
	Capital	\$0	\$0	\$0	\$0	\$0	\$5,091,339	\$459,009	\$1,503,924	\$1,084,907	\$1,850,000
TOTAL EXP	\$91,459	\$132,946	\$80,688	\$454,120	(\$340,788)	\$5,729,281	\$768,528	\$2,492,682	\$1,794,307	\$6,165,339	
HEALTHCARE AND STATEWIDE EXPANSION	Carry Forward					\$0	\$2,299,998	\$3,897,233	\$2,701,971	\$1,758,486	\$932,694
	New TRIF Revenue					\$2,299,998	\$2,020,412	\$1,991,194	\$1,652,526	\$1,466,620	\$1,464,496
	TOTAL REV					\$2,299,998	\$4,320,410	\$5,888,427	\$4,354,497	\$3,225,106	\$2,397,190
	Personal Services					\$0	\$0	\$914,583	\$1,305,631	\$1,439,916	\$1,200,000
	Other Operating					\$0	\$423,177	\$2,270,337	\$1,290,380	\$852,496	\$1,197,190
TOTAL EXP					\$0	\$423,177	\$3,184,920	\$2,596,011	\$2,292,412	\$2,397,190	
TSI -- YUMA/HEALTHY FORESTS	Carry Forward						\$1,264,210	\$1,500,000	\$1,049,276	\$23,223	
	New TRIF Revenue						\$735,790	\$274,169	\$278,086	\$277,683	
	TOTAL REV						\$2,000,000	\$1,774,169	\$1,327,362	\$300,906	
	Personal Services						\$0	\$699,049	\$1,139,724	\$280,000	
	Other Operating						\$0	\$25,844	\$164,415	\$20,906	
	Capital						\$500,000	\$0	\$0	\$0	
TOTAL EXP						\$500,000	\$724,893	\$1,304,139	\$300,906		
AZUN	Carry Forward			\$1,615,559	\$2,534,652	\$3,115,813	\$2,938,105	\$2,311,806	\$1,451,708	\$518,461	
	New TRIF Revenue			\$1,228,962	\$2,034,906	\$2,142,705	\$2,108,279	\$1,770,777	\$1,571,568	\$1,569,293	
	TOTAL REV			\$2,844,521	\$4,569,558	\$5,258,518	\$5,046,384	\$4,082,583	\$3,023,276	\$2,087,754	
	Personal Services			\$2,983	\$344,531	\$957,851	\$1,195,755	\$1,252,126	\$1,167,016	\$1,265,000	
	Other Operating			\$306,886	\$1,109,214	\$1,362,562	\$1,037,179	\$878,749	\$837,799	\$322,754	
	Capital			\$0	\$0	\$0	\$500,000	\$500,000	\$500,000	\$500,000	
TOTAL EXP				\$309,869	\$1,453,745	\$2,320,413	\$2,732,934	\$2,630,875	\$2,504,815	\$2,087,754	

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.

GROWING BIOTECHNOLOGY (GBI)

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

Director of Strategic Initiatives Shelley Silbert reports to 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

NAU TRIF OVERSIGHT BOARD MEMBERS:

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

E-LEARNING

ACCESS and WORKFORCE DEVELOPMENT (AWD)

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

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

AWD Advisory Board

This past year Extended Campuses collaborated with the College of Education with their Advisory Board. At their annual meeting there was a breadth of participation from the Arizona Board of Education, The Arizona School Administrators Association, and urban and rural teachers. The group offered feedback on the emerging needs of teacher professional development in the distressed economy. In the coming year we will seek opportunities to gain input from other workforce sectors including business, public management, and health to provide guidance on program development and student support needs.

Topics of discussion with workforce sectors will include:

Emerging opportunities for programs

*Collaborative efforts between University and state employers
Removing barriers to admission and enrollment for community college transfer students*

*Consulting on faculty recruitment
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** or **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/>.
- ⇒ To find out more about general TRIF projects and research at NAU, go to www.research.nau.edu.

NORTHERN
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ACCESS & WORKFORCE DEVELOPMENT



**NORTHERN
ARIZONA
UNIVERSITY**

September 1, 2010

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 Arizona Board of Regents and the Arizona public policymakers 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
Senior Vice President,
Extended Campuses

PERFORMANCE ANALYSIS

METRICS (\$ in millions)	FY02 Act	FY03 Act	FY04 Act	FY05 Act	FY06 Act	FY07 Proj	FY07 Act ¹	FY08 Proj	FY08 Act	FY09 Proj	FY09 Act	FY10 Proj	FY10 Act	FY11 Proj
Technology Transfer and Industry Collaborations														
Courses/Modules Sold/Brokered	0	5	0	0	0	1	0	1	0	1	0	1	0	1
Workforce Contributions														
Potential New Students Served														
New Teachers	250	542	807	679	773	700	910	700	1019	750	1058	750	969	750
Nurses/Health Professionals	120	266	414	464	540	400	585	500	640	500	680	600	715	600
Engineers with Advanced Training	20	Rptd in AZUIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business/Non-Profit Managers	44	182	303	442	528	400	657	400	725	450	816	450	924	500
Curriculum Innovations														
Degree/Certificate Programs	11	19	37	41	41	40	41	42	41	44	41	46	41	48
Statewide Access (Rural and Urban) [Yes/No]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional/National Global Access	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Revised Courses	75	72	105	153	176	40	206	40	225	40	244	40	248	40
Partnerships/Collaborations														
Community College Partners	14	16	17	17	19	17	19	17	20	17	20	17	20	17
Tri-University (ASU,NAU,U of A)	3	3	3	3	3	3	3	3	3	3	3	3	3	3
K-12 Partners (Schools/Districts)	30	51	119	127	127	120	127	125	126	130	125	135	125	140
Business/Government Partnerships	2	21	42	75	80	50	80	53	85	56	89	59	100	61

¹ Effective beginning FY07, reporting based on students eligible to enroll by program.

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 2010 Objectives and Accomplishments

Enrollments for FY 2010 were affected by the state of the economy. While some programs continued to grow others suffered some enrollment losses, particularly in graduate education. On-going expansion of partnership programs, establishment of new cohorts, sustained growth in web enrollments, strategic marketing and recruiting efforts all contributed to the overall successes.

- Teacher education programs at the undergraduate level grew modestly by 3% in FY10. Currently, the B.S. in Elementary Education program is serving 268 teacher candidates across Arizona. These gains were offset by lower enrollments in master's degree programs impacted by instability in employment and career progression for Arizona teachers. AWD funding will enhance our abilities to adapt to the changing needs of this segment of the Arizona workforce.
- Health Professions programs continue to be an important part of statewide outreach. Upcoming changes will expand the number of AAS programs in health related fields that will articulate with the B.S. Health Sciences/ Allied Health at NAU. This change will increase the number of medical technicians who can readily access a four-year degree program. A new Public Health option in 2010 offers a baccalaureate for students seeking to transition from other sectors into public health. Currently, BAS/BS Health Science/Community Health degrees serve 208 students around Arizona. The online RN-BSN saw 5% growth in FY 2010 and the Dental Hygiene degree completion program remained steady at just over 170 students. Overall, total number of students served across the health professions reached 715 students, an overall growth rate of 6%.
- Programs serving business and the public sector grew by 13% in FY 2010. The newly launched Technology Management degree offers the opportunity for students to be trained in managing technical resources. Currently 40 students are completing the BAS in Computer Technology or starting the new degree program, which allows for transfer of up to 90 hours from the community college. The Master of Administration program serves 557 active students. Both online and face to face models are used to deliver this popular program for early and mid-career working Arizonans.

FINANCIAL INFORMATION

AWD	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$1,490,660	\$2,074,249	\$1,604,439	\$1,579,182	\$1,223,971	\$738,477	\$320,660	\$451,400	\$602,801
TRIF Revenue	\$3,780,774	\$3,716,346	\$3,958,296	\$2,767,273	\$2,911,225	\$5,071,491	\$3,000,000	\$2,350,016	\$2,085,644	\$2,082,624
TOTAL REVENUE	\$3,780,774	\$5,207,006	\$6,032,545	\$4,371,712	\$4,490,407	\$6,295,462	\$3,738,477	\$2,670,676	\$2,537,044	\$2,685,425
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	\$1,944,263	\$1,922,126	\$2,553,000
Operating	\$531,632	\$823,495	\$1,636,784	\$644,637	\$812,639	\$512,253	\$575,623	\$275,013	\$12,117	\$132,425
Debt Svcs/Proj Buildout*	\$0	\$0	\$0	\$0	\$0	\$2,071,491	\$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	\$2,219,276	\$1,934,243	\$2,685,425

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 2010 Objectives and Accomplishments

The following objectives were met in FY 2010:

Student Services – Arizona students can select from over 30 urban and rural locations for assistance with admission, enrollment, payment, and advising. The Extended Campuses 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. Students continue to provide positive feedback about the services provided at our campuses around the state as well as through our central Service Center. Student satisfaction surveys are conducted by a 3rd party bi-annually to inform changes and improvements to practices.

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 Extended Campuses wide area network infrastructure upgrade was completed with new circuits utilizing MPLS (Multiprotocol Label Switching). Wi-Fi access points and web conferencing hardware (web cams and headsets) were installed at all Extended Campuses sites. Extended Campuses server and networking hardware is now housed in an upgraded server room with new network, HVAC and electrical infrastructure. Web server environments are now entirely virtualized. Redundant firewalls have been implemented for increased security.

Faculty Support – 248 web courses have been developed since FY 2003 with TRIF funding. Over 1,180 Web classes were taught during Academic Year 2009-2010 using a combination of TRIF and Extended Campuses funding with approximately 16% growth in Web enrollments.

MANAGEMENT

Programmatic oversight is through the Extended Campuses of NAU with the senior vice president for extended campuses 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.

LEARN MORE

Contact Fred Hurst, Senior Vice President, Extended Campuses at: Fred.Hurst@nau.edu, or call 928-523-6598. Or Visit the Extended Campuses website at <http://extended.nau.edu/>

ADVISORY BOARD

Objectives and Accomplishments cont....

Marketing – A comprehensive advertising campaign continued to blanket the state throughout FY10, including print, radio, web, outdoor, cable, and cinema advertising. In Spring 2010, postcards and emails featuring TRIF programs of potential interest were sent to over 175,000 educators, health professionals, government/non-profit employees, and NAU alumni. Web presence was expanded for several programs, and new high-quality brochures and fact sheets continued to support TRIF program promotion.

Advisory Board:

This past year Extended Campuses collaborated with the College of Education with their Advisory Board. At their annual meeting there was a breadth of participation from the Arizona Board of Education, The Arizona School Administrators Association, and urban and rural teachers. The group offered feedback on the emerging needs of teacher professional development in the distressed economy. In the coming year we will seek opportunities to gain input from other workforce sectors including business, public management, and health to provide guidance on program development and student support needs.

Topics of discussion with workforce sectors will include:

- Emerging opportunities for programs
- Collaborative efforts between University and state employers
- Removing barriers to admission and enrollment for community college transfer students
- Consulting on faculty recruitment

**NORTHERN
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UNIVERSITY**





THE ARIZONA UNIVERSITIES NETWORK

The Arizona Board of Regents gateway to quality distance learning

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 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 one of the universities
- Ability to select a degree or non-degree track, with a full- or part-time course load
- Automatic transfer of credits earned from the provider institution to the student's home institution
- Flexible learning formats providing anywhere, anytime access
- Consultation via email or phone with a home-institution coordinator when selecting classes or a program of study
- Payment of one tuition bill for classes taken at all three participating institutions
- Use of financial aid for classes taken through AZUN
- Graduation with a degree or certification conferred by the student's home institution



September 1, 2010

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

PERFORMANCE ANALYSIS

METRICS (\$ in millions)	FY05 Act	FY06 Act	FY07 Proj	FY07 Act	FY08 Proj	FY08 Act	FY09 Proj	FY09 Act	FY10 Act
Workforce Contributions									
Students Served									
Teachers	11	40	200	209	315	293	331	428	488
Nurses ¹	73	42	60	92	63	-	66		
Fire Science / Emergency Services Management	-	In Progress	50	In Progress	53	32	55	25	55
Law Enforcement	-	In Progress ²	50	16	53	153	55	201	272
Curriculum Innovations									
Degree/Certificate Programs	9(6)	9(3)	9(4)	9(3)	9(4)	8	9(4)	8	8
Regional/National Global Access	Yes	Yes	-	Yes	-	Yes	-	Yes	Yes
New/Revised Courses	30	16	30	13	30	9	30	16	27
Alternative Course Delivery (High Capacity & Short-Format)								323	374
Partnerships/Collaborations									
Community College Partners	17	19	19	19	19	20	19	20	20
K-12 Partners (schools/districts)	127	127	127	127	127	126	127	125	125
Out-of-State Partners	0	0	1	0	1	0	1	1	1
Growth Indicators									
Students Cross-Registering (per year) ²	331	370	400	379	420	527	441	276	224
Course Enrollments System-Wide ³	40,615	49,523	58,500	64,939	61,425	80,892	64,496	95,933	123,575
Courses Delivered System-Wide ³	1,170	1,860	2,200	2,362	2,310	3,610	2,426	3,500	4,072
Programs Delivered System-Wide ³	49	56	58	89	61	113	64	115	121
New Enrollments System-Wide ³	-	8,908	9,000	15,416	9,450	15,593	9,923	15,011	27,642
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: AZUN funding continues to be effective in producing new teachers for Arizona schools. The Early Childhood Education and the B.S. Elementary Education programs at South Mountain, North Valley, and East Valley continue to be popular choices for students. A total of 155 students are being served at these locations. Through an innovative partnership with Flowing Wells Unified School District and funding through AZUN for a full-time faculty member, two hundred students in Tucson are training to become elementary or special education teachers.

Law Enforcement: Degrees targeted toward law enforcement continue to attract students around the state. Student enrollment in programs serving law enforcement grew by 35% to a total of 272 students. Many students are electing to pursue programs that maximize transfer credit from local community colleges. One example is the Bachelor of Applied Science (B.A.S) in Administration of Justice in which currently serves 108 students. Beginning with the Fall 2010 term, students will be able to complete from 75 - 90 units at a community college where tuition is significantly lower. These options represent NAU's commitment to low cost access to four-year degrees.

Fire Science: Programs in emergency services administration and forestry continue to meet both firefighter needs and broader emergency responder requirements. Courses are developed for in-person and online delivery to best meet the needs of this target audience. These programs currently serve 55 students a 112% increase over the prior year. Recent curricular innovations will allow for many of these programs to accept up to 90 hours in community college credit.

Speech/Language Programs: A full-time faculty member based at the North Valley office teaches online courses for the speech/language pathology assistant certificate program which serves both the education and nursing sectors across the state. The program has grown from 81 to 132 students in just one year. More students were attracted to a four-year degree emphasis that became available in speech language sciences and technology.

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.

Development and Delivery of Shortened-Format Web Courses: The number of web courses in the 7-week format increased from 74 to 84 courses from FY09 to FY10, including two 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 249 to 290 in the last year.

FINANCIAL INFORMATION

AZUN	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$0	\$0	\$1,615,559	\$2,534,652	\$3,115,813	\$2,938,105	\$2,311,806	\$1,451,708	\$518,461
TRIF Revenue	\$0	\$0	\$0	\$1,228,962	\$2,034,906	\$2,142,705	\$2,108,279	\$1,770,777	\$1,571,568	\$1,569,293
TOTAL REVENUE	\$0	\$0	\$0	\$2,844,521	\$4,569,558	\$5,258,518	\$5,046,384	\$4,082,583	\$3,023,276	\$2,087,754
OPERATING BUDGET										
Personal Services	\$0	\$0	\$0	\$2,983	\$344,531	\$957,851	\$1,195,755	\$1,252,126	\$1,167,016	\$1,265,000
Operating	\$0	\$0	\$0	\$306,886	\$1,109,214	\$1,362,562	\$1,037,179	\$878,749	\$837,799	\$322,754
Debt Service	\$0	\$0	\$0	\$0	\$0	\$0	\$500,000	\$500,000	\$500,000	\$500,000
TOTAL EXPENDITURES	\$0	\$0	\$0	\$309,869	\$1,453,745	\$2,320,413	\$2,732,934	\$2,630,875	\$2,504,815	\$2,087,754

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/expenditure reported prior to official fiscal year close.

PERFORMANCE ANALYSIS

Program Development Continued...

Continue the Development of Competency-Based and Experiential Learning: Competency-based and experiential learning allows students to receive credit for life experience toward 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. A pilot project is under development to test the viability of using a portfolio-based, Prior Learning Assessment model to award Life Learning Credit for lower-division liberal studies courses.

Infrastructure: FY 2010 Objectives and Accomplishments

In October 2009 Extended Campuses and AZUN staff moved into a new facility partially funded through AZUN. The environmentally friendly design of the building garnered a gold rated LEED certification.

AZUN Portal: Technical staff at the AZUN and university levels continue to meet to enhance the Portal's capacities and to develop new functionalities.

The 2010–2014 AZUN Five-Year Strategic Plan includes as Action Plan Item #6: "conduct a study to determine the feasibility of including community colleges in the AZUN portal." Two community colleges are fully committed to the first phase: Rio Salado College (as a pilot for the Maricopa Community College District) and Mohave Community College. Coconino Community College, Northland Pioneer College and Yavapai Community College have also agreed to participate.

The participating colleges are inputting their online-program information into a development sandbox found at demo.azun.net.

Once we have maximum participation among our community college partners, a simple feasibility study designed to determine the technical capacity and costs of automatically receiving course schedule information from the community colleges into a searchable course catalog in the AZUN portal will be conducted.

The feasibility study is expected to be completed during the second half of FY2011.

AZUN STEM Program—Direct High School Instruction

AZUN funding is supporting the development, delivery and assessment of a chemistry course directly to rural high school students throughout the state (Goal #2, Action Plan #1).

An NAU Assistant Professor has been hired to write curriculum scripts for the Chemistry course episodes. A licensing agreement has been reached with Key Curriculum Press for non-exclusive rights to produce a DVD video derived from the textbook and ancillary materials. A promotional video will be delivered on September 15. Completed lessons will be delivered in three batches: on July 15, September 1, and October 15, 2011.

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.

AZUN student satisfaction: Ninety-four percent of students who cross-registered through AZUN reported having a good to excellent experience and indicated that they would recommend AZUN to a friend. Comments about the value of AZUN were mostly favorable, citing the ability to take required classes not offered at convenient times by home institutions, broader course options, and filling out schedules. While 58% of the respondents felt that the registration process was easy to navigate, 23% described it as difficult.

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: AZUN production, test and development web servers are now located in an upgraded server room with new network, HVAC and electrical infrastructure. The AZUN web environments are now entirely virtualized. Ten technical training sessions for students located on the Navajo, Hopi and Whiteriver Apache nations were conducted during the Spring 2010 semester.

Marketing:

In the fall of 2009, AZUN continued the campaign to promote cross-registration opportunities at NAU, ASU and UA. This campaign included multi-channel advertising on the three state university campuses: TV, print, outdoor, and radio, as well as statewide advertising in newspapers, on public radio, and on the Internet.

In the spring of 2010, AZUN continued direct marketing efforts to Arizona High School guidance counselors. AZUN also emailed businesses across Arizona focusing on engineering, business management and health sciences. Language and information is being added to the AZUN website promoting our partnerships with community colleges in Arizona.



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, 2010

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, hybrid and technology enhanced courses,
- ◆ Promotes learning-centered activities to increase student success,
- ◆ Provides expanded access to education regardless of location.

The e-Learning Center collaborates with faculty in the scholarship of teaching. Together we research and evaluate emerging technologies and new teaching practices. Promising technologies, such as live web-based video conferencing, classroom response systems, and social software such as wikis, blogs, and podcasts, are incorporated into courses. Our innovations are informed by current learning theory.

The e-Learning Center's programs actively involve faculty and students in the use of technology. For over three years 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, facilitate hybrid courses, and to provide web enhancements for face to face courses. This approach allows students easy access to syllabi, readings, assignments, and grades, while giving students and faculty new and effective ways to communicate and collaborate.

Programs developed and supported by the e-Learning Center include: 1. faculty engagement events, such as round-table forums and focus groups, 2. showcases highlighting faculty achievements in the use of instructional technologies, and 3. the e-Learning Institute in its 7th year, an annual 2-3-day conference, that promotes technology enriched learning "best practices" at NAU and other colleges and universities in the southwest.

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Don Carter, e-Learning Director

PERFORMANCE ANALYSIS

METRICS	FY 02 Actual	FY 03 Actual	FY 04 Actual	FY 05 Actual	FY 06 Actual	FY 07 Pro-jected	FY 07 Actual	FY 08 Pro-jected	FY 08 Actual	FY 09 Pro-jected	FY 09 Actual	FY 10 Pro-jected	FY 10 Actual	FY 11 Pro-jected
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	99	80
Number of new Hybrid courses developed						15	2	25	9	35	11	45	67 [a]	55
Number of new IT enhanced courses developed	0	32	42	53	7	20	80	25	>1000	30	15 > 1,000	35	22 [b] > 500	40
Number of courses redesigned						15	5	20	12	25	22	30	17	35
Number of faculty participating in Web development	150	117	155	126	241	200	325	225	210	250	397	300	201 [c]	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	13,500	39,025 [d]	14,000
Number of student enrollments in hybrid courses						1,000	36	1,300	1350	1,600	1,537	2,000	1,602 [a]	2,500
Number student enrollments in enhanced courses						2,000	2769	3,000	>10,000	4,000	>13,500	5,000	>14,950 [e]	6,000
Increase in student success in Web courses		5%	9%	16%	5.3% decrease	%	5%	5%	0%	5%	6%	5%	4.8% [f] decrease	5%
Increase in student success in enhanced & redesigned courses						5%	First Year	5%	0%	5%	0% [g]	5%	0%	5%
Percentage of students satisfied with Web learning	0	84%	89.2%	87%	87%	91%	86%	92%	96%	93%	90%	94%	92%	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	2,663	2,200
Number of graduates with advanced technical literacy skills						1,000	282	1,200	625	1,500	1,425	1,600	1,155 [h]	1,700
Partnerships														
Number of private sector partnerships	0	0	0	2	2	1	2	1	2	1	1	1	2	1
Number of scholarly publications/conference presentations						3	8	5	15	7	9	10	8	10

[a] These measures depend on course delivery mode descriptors in the class schedule. 2009-10 is the first year the "hybrid" has been an official delivery mode.
 [b] 65% of all courses at NAU are "IT enhanced". see [e]. 22 courses were highly supported, there are over 500 other courses newly using varying levels of support from e-Learning.
 [c] Of the 139 faculty coming to e-Learning for training in FY10, the most popular topics were Bb Vista (45), Web-conferencing (30), and webpage development (49).
 [d] 25,404 enrollments were Statewide Students .
 [e] Since Fall of 2006 all courses are provided a Blackboard Vista shell. More than 65% of the faculty use the online course shells.
 [f] Thus we estimate that more than 65% of the 23,000 students, or 14,950 use those resources.
 [g] The DFW rate increased from 14.3% to 14.98%, or a 4.74% increase (the 0.63 increase is 4.75% of 14.3). Recent years the DFW rate is pretty stable around 15%.
 [h] The DFW rate remained constant but overall the grade-point average did increase. A better means to identify success and collect data is needed.
 [i] This measure reflects the original set of courses using advanced technology. The set has grown over the years. We will reflect that in our next measure.

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 the curriculum. Through e-Learning Center programs and activities, graduates are prepared for the knowledge and innovation based economy in Arizona.

- ◆ Curricular innovations are critical to developing student and faculty technological skills. These innovations include the development and offering of new online courses, hybrid courses, and course redesigns.

⇒ Recent focus is on the enhancement and redesign of large enrollment introductory traditionally delivered courses including : Anthropology, Art, Biology, Chemistry, Communication, Computer Science, Forestry, Geology, History, 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 traditional 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 by NAU through the Arizona Universities Network (AZUN).

⇒ DFW (Drop, Failure, Withdrawal) rates are one the measure of course effectiveness. In 2009-10, DFW rate in web courses was 14.98%, though up a bit the trend has been right about 14-15%.

⇒ A 9.5% 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 enriched courses.

- ◆ Impact of the e-Learning Initiative is measured by the number of students with basic and advanced information technology fluency. A set collection of technology rich courses has been used. We need to develop multiple indicators 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

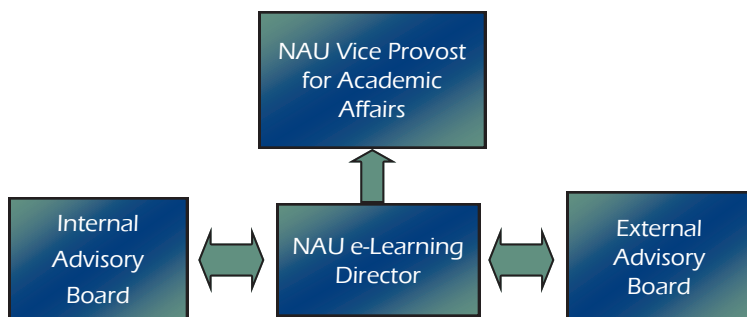
E-LEARNING	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$674,138	\$637,033	\$658,826	\$1,197,355	\$456,204	\$312,232	\$94,120	\$14,106	\$1,821
New TRIF Revenue	\$1,354,355	\$1,161,953	\$1,704,522	\$2,160,000	\$2,272,361	\$1,897,534	\$1,722,466	\$1,417,843	\$1,258,339	\$1,256,517
TOTAL REVENUE	\$1,354,355	\$1,836,091	\$2,341,555	\$2,818,826	\$3,469,716	\$2,353,738	\$2,034,698	\$1,511,963	\$1,272,445	\$1,258,338
OPERATING BUDGET										
Personal Services	\$567,521	\$1,103,269	\$1,310,577	\$1,525,599	\$1,697,066	\$1,729,924	\$1,538,100	\$1,369,059	\$1,090,120	\$1,120,000
Operating	\$112,696	\$95,789	\$199,959	\$298,244	\$1,316,446	\$311,582	\$401,162	\$128,798	\$180,504	\$138,338
TOTAL EXPENDITURES	\$680,217	\$1,199,058	\$1,510,536	\$1,823,843	\$3,013,512	\$2,041,506	\$1,939,262	\$1,497,857	\$1,270,624	\$1,258,338

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.



LEARN MORE

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

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 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 Internal Advisory Board consists of administration 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, Extended Campuses, Information Technology Services, and the Provost's Academic Computing Advisory Committee.

The internal board is responsible for recommending baseline technology learning outcomes, addressing standards for redesign, and reviewing internal grant projects.

NORTHERN
ARIZONA
UNIVERSITY



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



**NORTHERN
ARIZONA
UNIVERSITY**

September 1, 2010

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 Act	FY 08 Act	FY 09 Act	FY 10 Act	FY 11 Proj
Return on Investment										
Federal and State Funds	\$5.50	\$4.30	\$4.40	\$12.90	\$3.30	\$8.30	\$7.59	\$9.40	\$4.72	\$4.80
External Funding, Other	\$1.00	\$0.70	\$1.00	\$1.00	\$0.50	\$0.47	\$3.30	\$2.80	\$0.75	\$1.30
Qualitative Returns Including Presentations & Publications	121	180	138	305	119	221	3127 (includes web-site access)	114	78	180
Technology Transfer										
Products Generated and in the Marketplace	0	0	49	6	12	5	4	0	0	10
Business Spinoffs	1	0	1	1	1	4	2	0	1	3
Patent Applications Generated	1	0	0	0	0	1	4	2	0	4
Conferences Sponsored	14	19	21	28	26	21	42	2	4	20
Business Expansions	2	1	5	16	5	4	8	0	3	4
Work Force Contributions										
Graduate/Postdoc Students in Pipeline or Graduated	56	87	102	35	38	32	104	56	25	70
High End Baccalaureates in Specific Disciplines	38	27	47	23	15	3	21	22	9	6
Baccalaureates Produced in Related Disciplines	n/a	n/a	n/a	n/a	n/a	15	N/A	10	2	50
Certificates Granted	0	0	3	73	0	0	0		9	5
Undergrad Students in Pipeline	26	126	63	40	45	78	325	83	52	70
Continuing Ed Professionals	85	312	1361	142	265	42	142	29	9	160
Specific Curriculum Innovations										
New Programs such as Certificates (full time students)	3	1	1	0	2	2	2		0	1
Revised Courses	10	14	16	22	6	6	7	4	4	4
New Courses (full time students)	2	9	29	31	12	5	3	2	0	3
New Programs – Participating Professionals	0	0	0	0	9	4	0		0	2
Partnerships										
Community College 2+2 Programs	2	9	7	8	8	6	5	2	0	10
Tri-University (ASU, NAU, UofA)	4	6	7	10	9	2	8	12	3	18
Industry/Private Sector Collaborations	17	73	58	79	48	55	81	6	3	45
Community-based (including tribes)	34	58	51	60	76	78	45	8	5	45
Regional, Nat'l, International Research and Linkages	20	41	54	72	69	75	75	12	17	45

PERFORMANCE ANALYSIS

Highlights of ERDENE accomplishments by NAU investigators in FY10 include:

Acquisition of a state-of-the-art field and laboratory spectrometer system which helped to attract over \$2.5 million in new research funding for developing innovative remote sensing methods for detection and mitigation of non-native plant invasions in Arizona.

Establishment of the West African-clawed frog, *Xenopus tropicalis*, as a model system to monitor water samples for biologically relevant pollutants present in Arizona's water supply.

Incubation of a spinoff company that will license and market a mobile synthetic fuels "mini-plant", which produces carbon-neutral methanol synthesized from hydrogen and CO₂. This IP was been provisionally patented in FY10.



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

FINANCIAL INFORMATION

ERDENE	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$175,540	\$224,067	\$296,812	\$476,956	\$667,386	\$572,386	\$609,994	\$708,111	\$568,628
New TRIF Revenue	\$1,450,500	\$1,551,412	\$1,681,405	\$1,977,600	\$2,080,472	\$1,872,092	\$1,829,165	\$1,654,496	\$1,468,368	\$1,768,187
TOTAL REVENUE	\$1,450,500	\$1,726,952	\$1,905,472	\$2,274,412	\$2,557,428	\$2,539,478	\$2,401,551	\$2,264,490	\$2,176,479	\$2,336,815
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	\$1,203,103	\$1,095,501	\$2,145,000
Operating	\$212,735	\$242,466	\$224,416	\$301,376	\$464,348	\$64,366	\$352,712	\$353,276	\$512,350	\$191,815
TOTAL EXPENDITURES	\$1,274,960	\$1,502,885	\$1,650,660	\$1,940,724	\$1,890,042	\$1,967,092	\$1,790,069	\$1,556,379	\$1,607,851	\$2,336,815
ROI *	5.1 : 1	3.4 : 1	3.0 : 1	7.2 : 1	2.0 : 1	3.0 : 1	7.4 : 1	4.2 : 1	4.3 : 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.

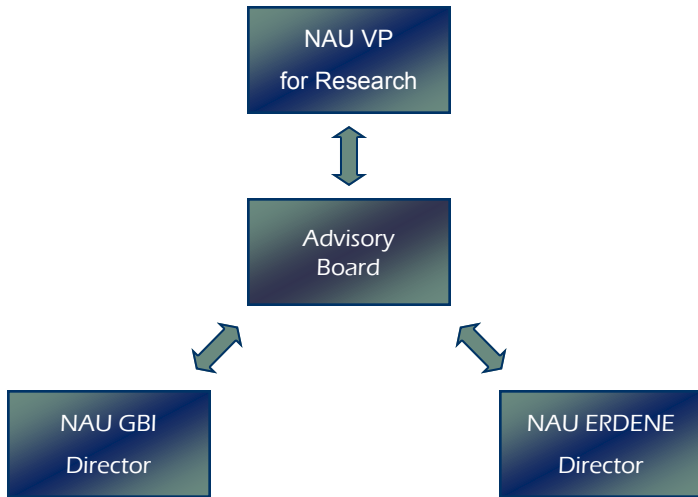


Preparing to model the carbon content of wood products from forest thinning

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.

MANAGEMENT

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



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

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, 2010

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.

Research areas supported by GBI focus primarily on strategic initiatives identified in the 2007 Arizona Bioscience Roadmap, and specifically areas identified in the 2008 Northern Arizona Bioscience Roadmap. Specifically, GBI funds research projects in new and emerging areas in the biosciences, including infectious diseases, medical instrumentation, forensic genetics, cancer, musculoskeletal and cardiopulmonary rehabilitation, endocrine systems, biomaterials, and respiratory failure.

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An emphasis on student participation in research at both undergraduate and graduate levels, combined with the high productivity of faculty and staff researchers, puts NAU in a unique position in Arizona: providing cutting-edge research opportunities for students while promoting technical education and workforce development at all levels for the growing bioscience and biotechnology industries in the State.

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.



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 Act	FY08 Act	FY09 Act	FY 10 Act	FY 11 Proj
Return on Investment										
Federal, State & Local	\$1.40	\$6.30	\$5.60	\$1.30	\$4.20	\$4.10	\$3.10	\$3.40	\$1.86	\$3.70
External Funding, Other	n/a	n/a	n/a	n/a	\$0.90	\$0.05	\$0.00	\$0.30	\$0.12	\$1.00
Number of Scholarly Publications	12	0	59	68	47	65	10	12	3	40
Technology Transfer										
Patent Applications Generated	1	2	2	1	3	1	1	2	1	2
Products Generated and in the Marketplace	0	5	0	2	1	0	0	0	0	2
Business Expansions	0	0	0	2	1	1	0	0	0	1
Technology Transfer: Start-Up Companies Created	0	2	1	0	1	1	0	0	0	1
Industry Partnerships	0	2	2	2	8	4	5	2	1	2
Economic Development										
Incubation/Formation of Biotech Concerns in Flagstaff / Northern Arizona	0	0	0	2	2	0	0	0	1	2
Work Force Contributions										
Graduate/Postdoc Students in Pipeline	60	62	60	25	29	26	24	5	11	30
Undergraduate Students with Research Experience	80	79	43	53	90	41	10	25	5	125
M.S./Ph.D. Graduate Increases	1	12	5	8	10	0	0	0	3	3
Specific Collaborations										
New Research Collaborations	6	29	3	17	28	13	10	10	4	7

RECENT ACCOMPLISHMENTS

Highlights of GBI accomplishments by NAU investigators in FY10 include:

Acquisition of an NMR Autosampler which provides a fast and reliable way to analyze samples in a high-throughput environment. More than 100 students enrolled in Chemistry courses which were enhanced by the increased analytical capacity of NAU's existing NMR. In addition, a \$1.3 million DoD research grant was due, in part, to the acquisition of this device.

Development of a biotechnology training program for science teachers in Northern Arizona and Native American high schools which led 80% of the participating teachers to develop a new biotechnology course for these rural schools. A follow-on grant from the Helios Foundation, *Junior Biotech*, will offer these teachers further biotech training under a model similar to that which was developed under this TRIF project.



Work in the Hurst, Browder and Gage Laboratories benefits from the NMR Autosampler acquired with TRIF funding in FY10.

FINANCIAL INFORMATION

GBI	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$363,216	\$510,270	\$200,490	\$353,276	\$341,247	\$342,851	\$216,370	\$65,704	\$14,068
New TRIF Revenue	\$967,002	\$1,123,132	\$817,501	\$768,000	\$807,951	\$918,732	\$533,507	\$303,571	\$269,420	\$130,905
TOTAL REVENUE	\$967,002	\$1,486,348	\$1,327,771	\$968,490	\$1,161,227	\$1,259,979	\$876,358	\$519,941	\$335,124	\$144,973
OPERATING BUDGET										
Personal Services	\$216,402	\$377,561	\$706,203	\$696,382	\$345,031	\$516,128	\$208,418	\$174,182	\$256,122	\$130,000
Operating	\$387,384	\$598,517	\$603,157	\$67,366	\$474,949	\$400,999	\$451,177	\$280,055	\$64,934	\$14,973
TOTAL EXPENDITURES	\$603,786	\$976,078	\$1,309,360	\$763,748	\$819,980	\$917,127	\$659,595	\$454,237	\$321,056	\$144,973
ROI *	5.1 : 1	3.4 : 1	3.0 : 1	7.2 : 1	2.0 : 1	3.0 : 1	12.3:1	4.2 : 1	6.2 : 1	3.4 : 1

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

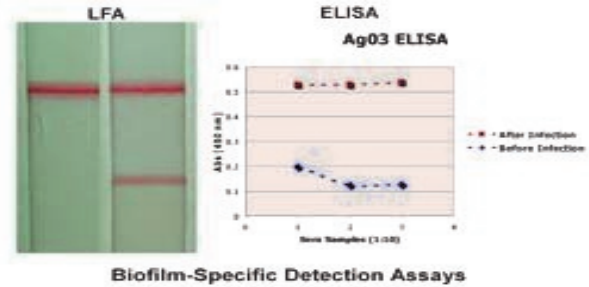
Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

GOALS

GBI fosters 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 Technology 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.



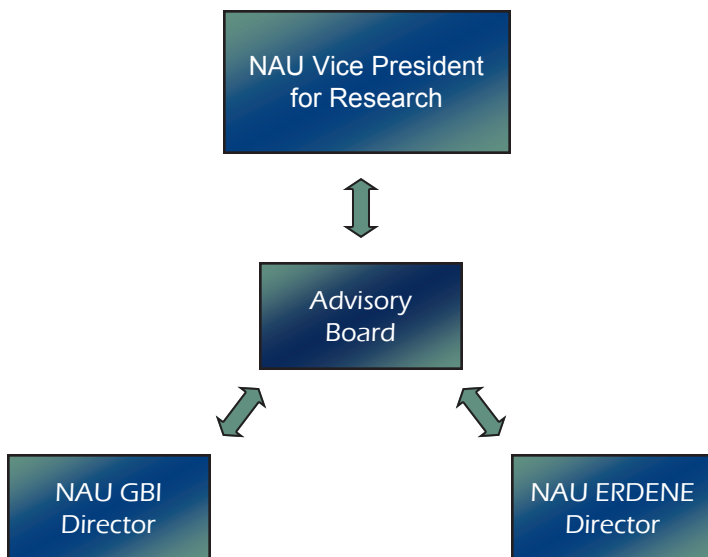
New lateral flow detection for infectious biofilms (4 patents pending).

MANAGEMENT

The GBI director reports to Dr. Laura Huenneke, Vice President for Research. A new GBI Director will be appointed in FY2011.

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 biotechnology areas.



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New Mexico State University Plant and Environmental Science Department

Paul Jagodzinski

Dean, NAU College of Engineering, Forestry & Natural Sciences

Thomas Whitham

NAU Department of Biological Sciences

LEARN MORE

Contact Lesley Cephas in the NAU Office of the Vice President for Research at Lesley.Cephas@nau.edu or call (928) 523-8288.

NORTHERN ARIZONA UNIVERSITY



HEALTHCARE PROGRAM EXPANSION



NORTHERN ARIZONA UNIVERSITY

September 1, 2010

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 Valley building, just off I-17 provides a focal point for all of NAU's current operations in Maricopa County and provides a place to implement the Health Care Program Expansion plan.

This is the fourth 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 program. 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.

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

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Nursing in Tucson

STRATEGIES AND GOALS

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. Since FY08, through the use of expansion dollars to hire an additional faculty member, a cohort of 48 has been admitted – a 25% increase. Through the use of funds from this initiative, the department was able to make many new contacts with institutions that could provide clinical internship experiences for students in the program.

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 now provides Health Science degree completion programs for students in seven different technical health care areas. The curriculum for this program is being revised and will allow articulation with even more community college degrees. This degree completion program is available completely on-line, thus allowing students to pursue their bachelor's degree while working in the area of their health-care training.

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 continued 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. The department lost one faculty member this fall, and so will be seeking to hire a replacement in FY10.

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 showed limited growth, and thus support for it will be withdrawn for FY11.

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 face-to-face program has been discontinued, but the on-line version of the program remains active and is growing.

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

STRATEGIES AND GOALS

Continued from page 2

Investment in the nursing program in Tucson has paid big dividends – the program is filled to capacity with nearly 200 students. 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.

Northern Arizona University’s School of Nursing strategically partnered with Yuma Regional Medical Center to create a four-year nursing bachelor’s program originally centered at YRMC. Many classes will now be moved to the NAU-Yuma branch campus, which will allow better access for faculty and students to the support facilities (library, student services and writing center) available there.

These programs complement the university’s successful nursing satellite programs on the Navajo reservation.

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

Communication Sciences and Disorders



PERFORMANCE ANALYSIS

EXTENDED CAMPUS PROGRAMS ONLY

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Projected
Program Enrollments							205	420	525	238
Degree Awards							71	64	156	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

HEALTH CARE EXPANSION	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$0	\$0	\$0	\$0	\$1,149,999	\$2,128,040	\$2,098,618	\$1,277,350	\$545,117
New TRIF Revenue	\$0	\$0	\$0	\$0	\$1,149,999	\$1,010,206	\$936,398	\$826,263	\$733,310	\$732,248
TOTAL REVENUE	\$0	\$0	\$0	\$0	\$1,149,999	\$2,160,205	\$3,064,438	\$2,924,881	\$2,010,660	\$1,277,365
OPERATING BUDGET										
Personal Services	\$0	\$0	\$0	\$0	\$0	\$0	\$659,318	\$1,305,631	\$1,439,916	\$1,200,000
Operating	\$0	\$0	\$0	\$0	\$0	\$32,165	\$305,734	\$341,900	\$25,627	\$77,365
TOTAL EXPENDITURES	\$0	\$0	\$0	\$0	\$0	\$32,165	\$965,052	\$1,647,531	\$1,465,543	\$1,277,365

- Health Sciences
 - Health Sciences
 - B.S. Health Sciences: Allied Health (Extended Major)
 - B.S. Health Sciences: Public Health (extended major)
 - B.S. Health Sciences: Diagnostic Medical Imaging and Therapy (extended major)
 - B.S. Health Sciences: Respiratory Care (extended major)
 - B.S. Health Sciences: Surgical Technology (extended major)
 - B.S. Health Sciences: Paramedic Care (extended major)
 - B.S. Health Sciences: Physical Therapist Assisting (extended major)
 - B.S. Health Sciences: Medical Assisting (extended major)

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 moving forward in health care education. The university is close to hiring the founding chair for a Physician Assistant program, and expects to have the program operating by Fall, 2011.

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. At the Flagstaff Campus, the Biomedical Sciences program instituted in FY08 now has nearly 300 students enrolled.

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, 2010

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:

- 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



Northern Arizona University—North Valley

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	Gateway	Glendale	Mesa	North Valley	Paradise Valley	Phoenix	Scottsdale	South Mountain	Tucson	Tucson North	West Valley
Unduplicated Campus Headcount	158	948	96	90	149	634	321	24	317	50	860	321	130
Faculty	1	11		2		7	3		3	1	11	5	
Amenities		X	X		X	X	X		X	X	X	X	X
Computer Lab						X					X		
Student Lounge		X				X					X		
Practicum Lab						X					X		
Wireless internet throughout facility		X				X					X		
Full time advisor		X				X					X		
Full time program coordinator		X	X			X					X		
Nursing bed lab				X							X		
Sim Man lab											X		
Facility Size (sf)	600	9,827	96	225	100	39,950	703	90	6,503	3,000	5,485	11,219	520
Degrees													
Undergraduate													
B.A./B.S. Interdisciplinary Studies - Administration of Justice (90/30)		X											
B.A./B.S. Interdisciplinary Studies - Emergency Services Administration (90/30)		X				X							
B.A./B.S. Interdisciplinary Studies - Public Management (90/30)	X					X	X				X		X
B.A./B.S. Interdisciplinary Studies - Technology Management (90/30)		X											
B.A.S. Justice Systems Policy and Planning						X					X		X
B.A.S. Public Agency Management	X												
B.A.S. Technology Management	X										X		
B.B.A. Business Administration							X				X		
B.S. Ed. Career and Technical Education - Occupational Education						X							
B.S. Ed. Elementary Education	X	X		X	X								X
B.S. Hotel & Restaurant Management													
B.S. Interior Design									X				
B.S. Speech Communication													
B.S.N. Nursing				X									
Graduate													
Bilingual Education Endorsement		X											
Ed.D. Educational Leadership		X									X		
English as a Second Language Endorsement		X									X		
M. Administration - Leadership		X									X		
M.A. Counseling													
M.Ed. Bilingual/Multicultural Education		X											
M.Ed. Counseling/School Counseling		X											
M.Ed. Early Childhood Education		X											
M.Ed. Educational Leadership		X											
M.Ed. Elementary Education with Certification Emphasis		X											
M.Ed. Elementary Education-Continuing Professional Emphasis		X											
M.Ed. Human Relations		X											
M.Ed. in Secondary Education-Continuing Professional Emphasis		X											
M.Ed. Secondary Education with Certification Emphasis		X											
M.Ed. Special Education: Cross-Categorical (noncertified)		X											
Non Degree - Personal Enrichment (Graduate)		X											
Post-Professional Doctor of Physical Therapy	X												
Principal Certificate			X										
Reading Endorsement		X											
Superintendent Certificate		X											

NARRATIVE

- In the fourth year of a partnership between the Maricopa Community Colleges and Northern Arizona University, the NAU-Maricopa Connection has flourished. (www.maricopa.edu/connection) Through the site, students can easily identify programs, locations, advisors and scholarship information in one central location. In the spring of 2010, Maricopa Colleges and NAU agreed to launch a joint admission program allowing first year Maricopa students to be immediately admitted to NAU while they complete their first two years at the community college. These students will be able to access NAU online and advising resources to promote the completion of both the associate and baccalaureate degrees.

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 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's greater visibility on the Scottsdale Community College campus in a newly remodeled facility enhanced the ability to recruit students into programs offered on the campus and online. Full time faculty members in Hotel & Restaurant Management, Interior Design, and Early Childhood Education programs are located on campus and contributed to the growth of these programs during the 09-10 academic year.

NAU also maintained 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. New offices at Estrella Mountain Community College will help NAU to better serve the educational needs of the West Valley.

- Growth in the Bachelor of Business Administration (BBA) program has been significant. Faculty at the NAU Yuma Branch Campus, recognizing the need of Arizonans for accessible business education, have developed the entire program in an online format. The first group of online students were able to start the program in academic year 2009-2010. The program has also grown rapidly at Paradise Valley Community College. Advisors and coordinators supported by expansion funds assist with recruiting and advising for the program, which is currently serving 390 students.

FINANCIAL INFORMATION

STATEWIDE	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$0	\$0	\$0	\$0	\$1,149,999	\$1,769,193	\$603,353	\$481,136	\$387,577
New TRIF Revenue	\$0	\$0	\$0	\$0	\$1,149,999	\$1,010,206	\$1,054,796	\$826,263	\$733,310	\$732,248
TOTAL REVENUE	\$0	\$0	\$0	\$0	\$1,149,999	\$2,160,205	\$2,823,989	\$1,429,616	\$1,214,446	\$1,119,825
OPERATING BUDGET										
Personal Services	\$0	\$0	\$0	\$0	\$0	\$0	\$255,265	\$0	\$0	\$0
Operating	\$0	\$0	\$0	\$0	\$0	\$391,012	\$1,964,603	\$948,480	\$826,869	\$1,119,825
TOTAL EXPENDITURES	\$0	\$0	\$0	\$0	\$0	\$391,012	\$2,219,868	\$948,480	\$826,869	\$1,119,825

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 was successfully transitioned to web based technologies beginning Fall 2009. This new technology enables NAU to join leaders in higher education who are using these cutting edge capabilities to conduct business and deliver courses. NAU is committed to remaining competitive 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. Three new content areas will be available in the 90/30 format starting fall 2010 in Emergency Services Administration, Technology Management, and Administration of Justice. 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. New degree options in Allied Health and Public Health have been developed and will be available fall 2010 to increase the number of highly skilled medical professionals 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. New on-line offerings are continually in development, providing even more opportunities for students to earn degrees or certificates while remaining in the workforce.

LEARN MORE

Contact Fred Hurst, Senior Vice President, Extended Campuses, at Fred.Hurst@nau.edu, or call 928-523-6598. Or Visit the Extended Campuses website at <http://extended.nau.edu/>

NORTHERN
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NAU-Yuma Expansion



NORTHERN ARIZONA UNIVERSITY

September 1, 2010

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.

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 has invested 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 technology.

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 has invested, 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.

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.

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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 Resources

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 22 years NAU has been committed to meeting 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, public administration, technology management, and applied sciences will play a major role in diversifying local economy—the path to assuring the region's long-term prosperity.

FINANCIAL INFORMATION

YUMA	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$0	\$0	\$0	\$0	\$0	\$1,264,210	\$1,500,000	\$954,089	\$0
New TRIF Revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$735,790	\$0	\$0	\$0
TOTAL REVENUE	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000,000	\$1,500,000	\$954,089	\$0
OPERATING BUDGET										
Personal Services	\$0	\$0	\$0	\$0	\$0	\$0		\$538,114	\$825,394	\$0
Operating	\$0	\$0	\$0	\$0	\$0	\$0		\$7,797	\$128,695	\$0
Building Renovation	\$0	\$0	\$0	\$0	\$0	\$0	\$500,000	\$0	\$0	\$0
TOTAL EXPENDITURES	\$0	\$0	\$0	\$0	\$0	\$0	\$500,000	\$545,911	\$954,089	\$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”, the building 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 has largely been equipped with at least the minimum equipment necessary to support student learning. 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 continue to work closely with the local community to insure that the program supports the needs of the Yuma Region. There are three major, new, highlights to be reported. The first is the tremendous growth in the Biology and Environmental Science programs. There are currently 42 students in these two programs, up from about 14 students two years ago. The pipeline of students from AWC continues to grow, as well, with approximately 95 students preparing to move from the lower-division course work at AWC to the upper-division course work at NAU. The second highlight concerns the career paths of our recent graduates. Three of our recent graduates were accepted into medical school, one was accepted into veterinary school, two others have been accepted into graduate programs and one has secured a local position with the Bureau of Land Management. The final highlight involves the cooperative agreement with the Bureau of Land Management in which NAU students work in the green houses on campus to produce over 10,000 seedling trees per year for the reintroduction of trees into to Lower Colorado River Region. None of these successes would have been possible without the financial support provided by the Yuma Expansion funding.



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. A technology management program has been added to the BBA portfolio along with a BAS/BIS in Administration. Both of the programs began 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. 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.

Development of the 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 in the “Healthcare Program Expansion” report.

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.

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. Since the last report, the Writing Center has been opened and with the support of a Federal Department of Education Grant it has been staffed with peer tutors. The peer tutors are in addition to the Writing Center Coordinator position which is supported with Yuma Expansion funding. 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. At present the Writing Center assists approximately 47 students a week, while working directly with faculty on the development of writing portfolios and learning outcomes. The best example of the success of the Writing Center has been the increase (72 percent to 83 percent) in the number of students who pass the APEA exam on the first attempt. Anecdotally, faculty report a very high level of satisfaction with the work done by the Writing Center.

Enrollment

For the last two years, as a result of the Yuma Expansion funding, enrollment has increase by 17 to 21 percent as compared to the same semester in the previous year. For example the Yuma headcount in the Fall of 2008 was 527 students and in the Fall of 2009 it had increased to 885 students. Similarly, the Spring comparisons also show growth. The final headcount for the Spring of 2009 was 608 students and for the Spring of 2010 the headcount was 954. Additionally, the Yuma Branch Campus is experiencing much larger graduating classes (Source: Planning and Institutional Research). In the Spring of 2010, slightly more than 500 students graduated with a Bachelors, Masters, or Doctorate from programs offered primarily by the Yuma Branch Campus or in programs in which the majority of the course work was taken on the Yuma Branch Campus.

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.

LEARN MORE

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

**NORTHERN
ARIZONA
UNIVERSITY**



Healthy Forest



NORTHERN ARIZONA UNIVERSITY

September 1, 2010

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:

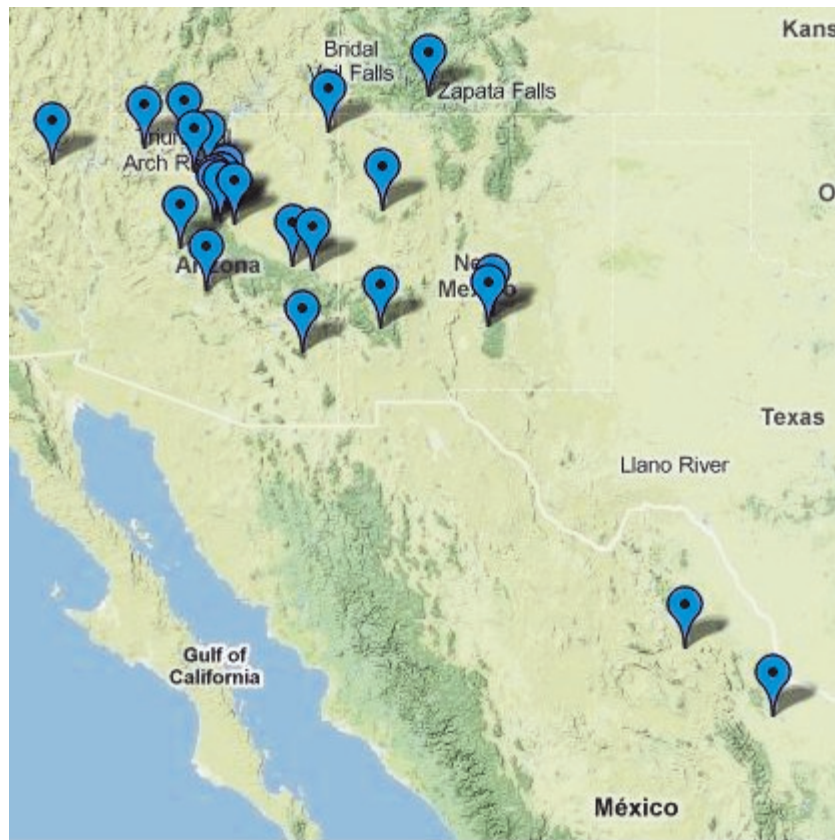
- Increase Student Participation in University Education
- Enhance the Quality of Student Education
- Increase Affordable Education for Students
- Provide an Educated, Competitive Workforce
- Optimize University Resource

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.

ERI Worksites



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 continues to play a leadership role in these initiatives.

In 2010, ERI’s accomplishments included:

- Produced the “Field Guide to Forest and Mountain Plants of Northern Arizona”, a 650-page comprehensive and current botanical resource which is the first book of its kind for the higher-elevation ecosystems of northern and eastern Arizona. Former U.S. Interior Secretary and Arizona Governor, Bruce Babbitt, wrote the book’s forward. The book is available for sale at the NAU bookstore (www.nau.bkstr.com).
- Created a television informational piece bringing awareness to the need for forest restoration. This video will be aired throughout Arizona on FOX television for the next two years.
- Conducted “Walks in the Woods”, in conjunction with the U.S. Forest Service, in Payson and Prescott to residents and visitors to demonstrate the difference between today’s unnatural forest structure and forest conditions before European settlement of the West in the late 1800s and to showcase forest treatments in the urban interface—where homes meet the forest.
- Regents’ Professor of Forest Ecology Dr. William “Wally” Covington was presented with the prestigious Theodore M. Sperry Award by the Society for Ecological Restoration International at its 19th world conference in Perth Australia. The Sperry Award honors individuals who have made a significant contributions to the science or technique used in restoration practices. Dr. Covington was recognized for being the leading voice for ecological restoration in the ponderosa pine ecosystems on the Intermountain West. “More than any other single individual, Wally Covington has provided the combination of science and vision for restoration of ponderosa pine forests of North America, where he has worked for more than 30 years, both as a graduate student and then as a member of the faculty of NAU. During this time, he has contributed enormously to the basic understanding of structure and function of ponderosa pine forests, as reflected in a truly extraordinary lifetime record of publication in restoration ecology,” said the Society’s Awards Committee Chair Alan Unwin.



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

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

HEALTHY FORESTS	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$95,187	\$23,223
New TRIF Revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$274,169	\$278,086	\$277,683
TOTAL REVENUE	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$274,169	\$373,273	\$300,906
OPERATING BUDGET										
Personal Services	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$160,935	\$314,330	\$280,000
Operating	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,047	\$35,720	\$20,906
TOTAL EXPENDITURES	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$178,982	\$350,050	\$300,906



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.

UNIVERSITY INITIATIVES



NORTHERN
ARIZONA
UNIVERSITY

September 1, 2010

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. For FY10, the most significant investments were in research facilities — completing the Bio-Safety Level (BSL)-3 lab in the Applied Research and Development building, thus allowing the Keim lab to pursue its work with select agents, and upgrading the autoclaves in the Lab Building to allow for more effective research. In addition, there was continued support of the Interdisciplinary Health Institute.

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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



Updated classrooms are part of the upcoming Health and Learning Center

PERFORMANCE ANALYSIS



New Lab Building – equipment enhanced



Photo credit Tom Alexander

FINANCIAL INFORMATION

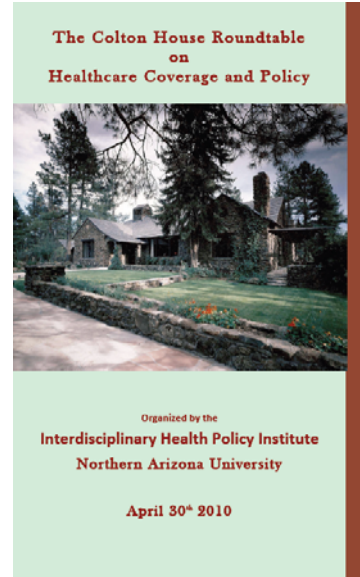
UNIVERSITY INITIATIVES	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 Actual	FY 2011 Revised Budget
REVENUE										
Carry Forward	\$0	\$0	\$0	\$108,919	\$637,169	\$2,497,593	\$283,312	\$2,648,863	\$2,989,894	\$3,710,515
TRIF Revenue	\$0	\$0	\$0	\$1,503,078	\$754,432	\$690,001	\$3,239,528	\$2,833,713	\$2,514,928	\$2,454,824
TOTAL REVENUE	\$0	\$0	\$0	\$1,611,997	\$1,391,601	\$3,187,594	\$3,522,840	\$5,482,576	\$5,504,822	\$6,165,339
OPERATING BUDGET										
Personal Services	\$0	\$0	\$0	\$238,169	\$336,383	\$153,992	\$219,028	\$428,828	\$430,408	\$1,591,800
Operating	\$0	\$0	\$0	\$17,800	(\$1,442,375)	\$483,950	\$90,491	\$559,930	\$278,992	\$2,723,539
Building Renovation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$684,907	\$1,300,000
Debt Svc/Capital	\$0	\$0	\$0	\$0	\$0	\$266,340	\$459,000	\$1,503,924	\$400,000	\$550,000
Conference Center	\$0	\$0	\$0	\$0	\$0	\$2,000,000	\$162,830	\$0	\$0	\$0
TOTAL EXPENDITURES	\$0	\$0	\$0	\$255,969	(\$1,105,992)	\$2,904,282	\$931,349	\$2,492,682	\$1,794,307	\$6,165,339

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:

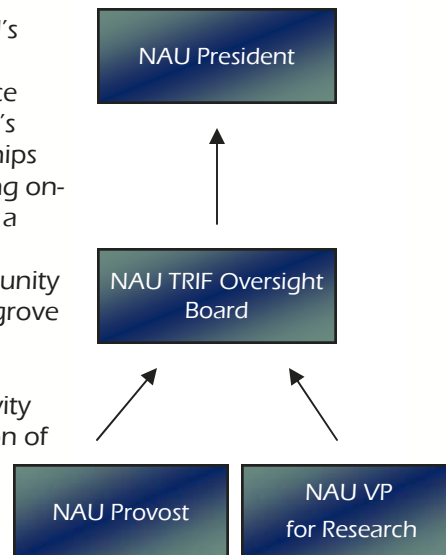
- ◆ Support of an innovative, interdisciplinary Health Policy Institute to complement the university's investment in health care programming.
- ◆ Contributions to improvements in the Keim lab in the Applied Research and Development building which enabled the lab to extend its research capability beyond 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.



In 2011 we anticipate investments in NAU's innovative bachelor's degree program in Yavapai County, a new Professional Science Master's degree in Climate Solutions, NAU's expanding "2 NAU" programs — partnerships with Arizona community colleges providing on-the-ground advising, joint admissions and a seamless transition path for students who begin their higher education at the community college and support of the prestigious Bisgrove Scholars program, a Science Foundation Arizona program to attract post-doctoral students who will contribute to the creativity and competitiveness of the next generation of academic researchers in science and engineering.



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



Oversight Board Membership:

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

MANAGEMENT

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

LEARN MORE

Contact: Dr. 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 2010 ACTUAL / FY 2011 BUDGETS
SUMMARY

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE						
Carryforward	\$ 6,812,073	\$ 9,005,784	\$ 5,854,007	\$ 1,072,941	\$ 1,268,778	\$ 2,546,090
TRIF Revenue	25,351,822	26,384,855	22,275,873	20,865,905	19,612,791	19,598,143
TOTAL REVENUE	\$ 32,163,895	\$ 35,390,639	\$ 28,129,880	\$ 21,938,846	\$ 20,881,569	\$ 22,144,233
EXPENDITURES						
OPERATING BUDGET						
Personal Services	\$ 8,486,483	\$ 11,666,431	\$ 11,209,729	\$ 11,400,151	\$ 7,843,188	\$ 10,390,615
ERE	2,606,677	3,476,967	3,499,028	3,430,979	2,321,356	3,208,855
All Other Operating	8,410,706	11,262,728	8,904,805	4,107,716	4,948,865	5,544,763
TOTAL OPERATING BUDGET	19,503,866	26,406,126	23,613,562	18,938,846	15,113,409	19,144,233
CAPITAL BUDGET						
Building Renovation	169,007	(285,963)	27	-	5,184	-
Debt Service	4,465,000	3,416,469	3,443,350	3,000,000	3,216,886	3,000,000
TOTAL CAPITAL BUDGET	4,634,007	3,130,506	3,443,377	3,000,000	3,222,070	3,000,000
EXPENDITURES GRAND TOTAL	\$ 24,137,873	\$ 29,536,632	\$ 27,056,939	\$ 21,938,846	\$ 18,335,479	\$ 22,144,233
SUMMARY BY INITIATIVE						
Bioresearch Program	\$ 5,878,772	\$ 9,000,889	\$ 7,610,195	\$ 6,871,524	\$ 5,727,855	\$ 7,155,833
Optical Sciences and Technology Program	3,187,607	3,340,957	3,642,702	2,584,031	2,264,489	2,444,377
Water and Environmental Sustainability Program	3,473,905	5,001,366	4,267,031	3,229,577	2,654,067	3,202,074
Higher Education in Rural Southern Arizona	-	-	315,800	622,923	588,540	34,383
Education and Infrastructure Program	8,160,936	9,100,061	8,776,787	7,388,638	6,540,537	7,641,966
Planning for Phoenix Biomedical Campus	211,146	447,332	91,522	-	-	-
Expansion of Phoenix Biomedical Campus	2,009,192	920,628	596,831	586,529	47,317	1,039,212
ASU-UA Joint Biomedical Research Fund	187,472	1,040,892	248,763	-	-	-
ASU-UA Solar Energy Initiative	-	224,876	1,388,172	595,624	486,029	598,613
Venture Fund	1,028,843	459,631	119,136	60,000	26,645	27,774
EXPENDITURES GRAND TOTAL	\$ 24,137,873	\$ 29,536,632	\$ 27,056,939	\$ 21,938,846	\$ 18,335,479	\$ 22,144,233

THE UNIVERSITY OF ARIZONA
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA

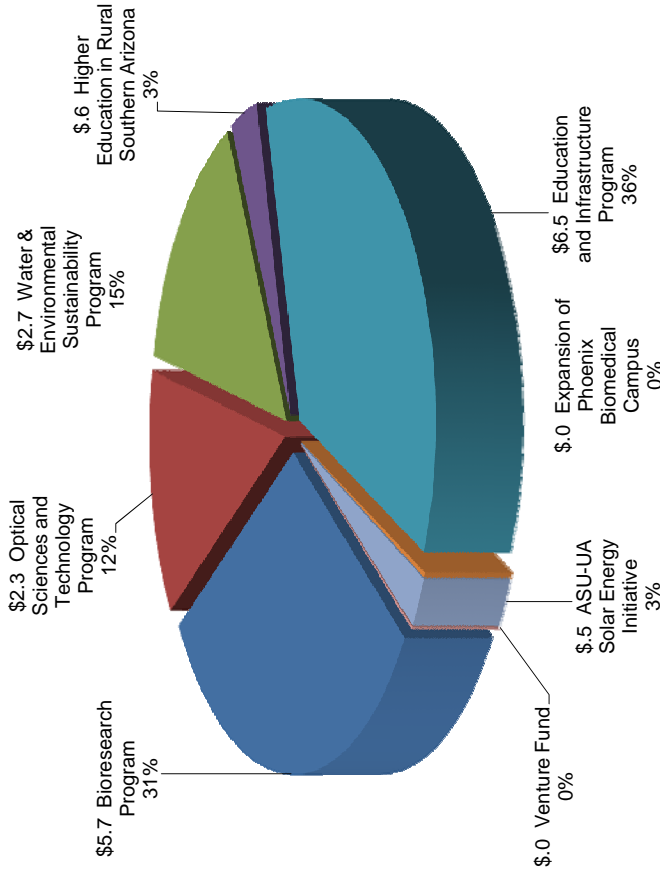
	FY 2010 REVISED BUDGET	FY 2010 ACTUAL
REVENUE		
Carryforward	\$ 1,072,941	\$ 1,268,778
TRIF Revenue	20,865,905	19,612,791
TOTAL REVENUE	\$ 21,938,846	\$ 20,881,569
EXPENDITURES		
OPERATING BUDGET		
Personal Services	\$ 11,400,151	\$ 7,843,188
ERE	3,430,979	2,321,356
All Other Operating	4,107,716	4,948,865
TOTAL OPERATING BUDGET	18,938,846	15,113,409
CAPITAL BUDGET		
Building Renovation	-	5,184
Debt Service	3,000,000	3,216,886
TOTAL CAPITAL BUDGET	3,000,000	3,222,070
EXPENDITURES GRAND TOTAL	\$ 21,938,846	\$ 18,335,479

SUMMARY BY INITIATIVE

Bioresearch Program	\$ 6,871,524	\$ 5,727,855
Optical Sciences and Technology Program	2,584,031	2,264,489
Water and Environmental Sustainability Program	3,229,577	2,654,067
Higher Education in Rural Southern Arizona	622,923	588,540
Education and Infrastructure Program	7,388,638	6,540,537
Expansion of Phoenix Biomedical Campus	586,529	47,317
ASU-UA Solar Energy Initiative	595,624	486,029
Venture Fund	60,000	26,645
EXPENDITURES GRAND TOTAL	\$ 21,938,846	\$ 18,335,479

FY 2010 UA ACTUAL TRIF EXPENDITURES

(in millions)



UA TRIF PROGRAM

REPORT FOR FY2010
SEPTEMBER 1, 2010

THE UNIVERSITY OF ARIZONA TRIF PROGRAM

At the University of Arizona, the Technology and Research Initiative Fund (TRIF) supported innovative 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 supported technology transfer, distance-learning activities, and K-12 outreach in science and math. The tight economy in 2009-2010 led to a tightened focus on use of UA TRIF funds to enhance applied research and to leverage federal or other external grants and contracts, including Federal Stimulus dollars. Research-intensive TRIF activities at the UA fall under thematic Programs.

- **The Bioresearch Program** includes the BIO5 Institute for bioscience and biotechnology, the McKnight Brain Institute, and the Arizona Clinical and Translational Research and Educational Consortium. BIO5 continued UA leadership of a \$50 million NSF project to enhance basic and applied plant research this year, and ACTREC supported 50 clinical research protocols.
- **The Optical Sciences and Technology Program** supports applied research and commercialization in our top-ranked optics and space sciences programs. This Program spun out three new companies and leveraged a record \$54 million in grants and contracts this year, and has especially strong ties with industry.
- **The Water and Environmental Sustainability Program** includes Water Sustainability and Translational Environmental Research, which launched a master's program in Water, Society, and Policy, attracted significant external funding, including \$5.8 million in Stimulus funds, and excelled in K-12 outreach.

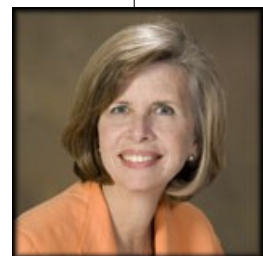
Two additional programs are funded by ABOR's Strategic Investments fund. The **UA-ASU Solar Energy Initiative** supported basic and applied research activities in science, engineering, and public policy that leveraged over \$16 million in external funding. **Higher Education in Rural Southern Arizona** delivered training and border commerce programs in Arizona's border counties in a hybrid of on-site and distance education. Our final Program, in **Education and Infrastructure**, through the Educator Development Plan, distance education through Anyplace Access for Arizonans, and on-line educational programs of the College of Nursing, dramatically increased the number of students served. Support was also provided for infrastructure improvements that build UA's research capacity.

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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	FY10 Actual	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	\$ 168.67	\$ 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	\$ 3.91	\$ 4.05
Patent Royalty Income	\$ 0.71	\$ 1.08	\$ 1.01	\$ 1.18	\$ 1.69	1.52	1.22	1.67	.69	1.82	.69	1.97	.72	2.11
TECHNOLOGY TRANSFER & COLLABORATIONS														
Invention Disclosures	109	111	95	102	88	135	104	114	99	114	124	135	131	145
Licenses & Options	18	24	25	32	26	38	30	36	39	36	43	40	64	45
Patent Applications	62	77	91	106	109	105	121	115	143	115	125	120	119	125
New Start-up Companies	10	1	7	9	6	14	3	5	5	5	7	6	6	7
Economic Impact Studies	0	0	1	1	0	1	2	1	0	1	0	1	1	1
WORKFORCE CONTRIBUTIONS														
Number of Graduate Students Enrolled		1,183	1,318	1,378	1,429	326	219	400	276	344	442	369	656	406
Number of Undergraduates Enrolled								20	20	56	71	66	449	76
Growth in Graduate Enrollment	35	20	26	4	29	3	15	4	(4)	3	22	4	23	4
Number of Graduate Degrees Awarded		266	280	285	420	58	29	40	56	45	56	53	66	61
New Graduates from ACIST related programs	0	69	256	224	100									
Growth in Optics-Related Undergraduate Enrollment	12	25	44	25	(12)	4	(40)	6	(5)	4	(3)	4	20	4
Number of Undergraduate Degrees Awarded	0	658	705	733	1,014	0	0	0	0	0	0	20	1	30
Growth in Optics-Related Distance Learning Enrollment	3	48	32	32	23	5	(8)	8	(34)	8	(11)	2	(24)	2
Undergraduate Trainees	0	9	22	40	313	284	390	290	412	296	429	314	387	317
Graduate Trainees	1	16	54	75	379	339	368	361	478	375	424	352	383	377
Postdoctoral Trainees	2	2	3	3	140	158	156	154	167	159	163	160	141	169
ACIST graduates benefitting from minors in related	25	50	100	77	75									
Undergraduates taking non-technical minor	50	100	150	111	75									
Teachers Certified in Undergraduate Level Math &	7	12	22	20	24	40	24	40	25	30	27	30	24	30
Teachers Certified in Master's Level Math & Science	28	25	26	40	24	30	24	30	14	25	14	25	15	25
Teachers Certified in Agriculture	8	13	16	16	12	15	11	17	13	19	17	20	17	20
Total Student Credit Hours Produced										300	107	300	2,025	300
Number of Certificates Granted						9	50	0	85	99	12	125	31	158
Number of New Certificates Offered								0	0	2	1	2	2	2
Clinical Scholars Circle Members						40	44	50	52	80	90	120	90	150
Number of Affiliate Clinical Partners in ACTREC						9	3	14	32	21	25	34	30	47
New Faculty Hires	11	16	9	13	13	16	22	9	12	12	15	9	7	10
CURRICULUM INNOVATIONS & STUDENTS SERVED														
Number of Newly Revised Courses Offered				8	10	15	49	9	15	33	42	116	97	323
Number of Online Courses Offered	0	10	19	28	28	37	16	10	20	25	79	23	100	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	1,735	1,294
K-12 Students Benefiting & 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	65,694	85,900
Workshops, Seminars, & Conferences Supported	11	9	11	11	29	22	38	24	73	34	71	30	241	40
Users of Extension & Workplace Resources	0	493	58,000	103,000	156,055	200,000	314,415	250,000	225,503	300,000	5,470,117	350,000	298,751	400,000
Communities Assisted						5	7	10	9	10	12	10	26	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	3,981	3,024
DATA AND RESEARCH ACCESS & NETWORK														
Building Networks Brought to Standards						1	1	1	1	1	1	1	0	1
Supercomputer Usage						85-90%	90%	85-90%	78%	85-90%	94%	85-90%	96%	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	75th or better

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	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	7,966,808	6,871,524	6,647,769	7,155,833
Expenditures	2,075,899	7,199,779	3,852,669	6,220,377	7,645,577	5,878,772	9,000,889	7,610,195	6,871,524	5,727,855	7,155,833
Return on Investment	0.7:1	2.2:1	6.6:1	4.3:1	3.5:1	6.4:1	5.2:1	9.8:1	5.2:1	11.2:1	5.4:1
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	3,570,688	2,584,031	2,318,426	2,444,377
Expenditures	2,859,694	6,014,645	4,480,050	3,627,920	5,142,408	3,187,607	3,340,957	3,642,702	2,584,031	2,264,489	2,444,377
Return on Investment	4.0:1	0.6:1	4.5:1	0.7:1	1.9:1	6.8:1	9.4:1	10.1:1	9.8:1	24.2:1	10.6:1
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	4,213,403	3,229,577	2,901,256	3,202,074
Expenditures	32,203	827,112	1,667,088	2,302,796	3,813,467	3,473,905	5,001,366	4,267,031	3,229,577	2,654,067	3,202,074
Return on Investment	-	2.2:1	1.2:1	1.5:1	0.9:1	3.0:1	3.8:1	5.6:1	4.0:1	11.5:1	4.3:1
Education and Infrastructure Program											
Revenue	2,233,439	3,468,894	3,076,975	3,170,342	3,549,332	8,718,378	9,721,719	9,066,371	7,388,638	7,215,749	7,641,966
Expenditures	1,070,234	2,903,876	2,523,545	2,706,933	3,151,044	8,160,936	9,100,061	8,776,787	7,388,638	6,540,537	7,641,966
Venture Fund											
Revenue	-	-	-	68,123	68,123	1,201,622	603,234	173,556	60,000	54,420	27,774
Expenditures	-	-	-	-	68,123	1,028,843	459,631	119,136	60,000	26,645	27,774
ASU-UA Joint Biomedical Research Fund											
Revenue	-	-	-	-	-	1,000,000	1,052,528	248,763	-	-	-
Expenditures	-	-	-	-	-	187,472	1,040,892	248,763	-	-	-
Planning for Phoenix Biomedical Campus											
Revenue	-	-	-	-	-	750,000	538,854	91,522	-	-	-
Expenditures	-	-	-	-	-	211,146	447,332	91,522	-	-	-
Expansion of Phoenix Biomedical Campus											
Revenue	-	-	-	-	-	2,145,000	1,269,679	683,360	586,529	586,529	1,039,212
Expenditures	-	-	-	-	-	2,009,192	920,628	596,831	586,529	47,317	1,039,212
ASU-UA Solar Energy Initiative											
Revenue	-	-	-	-	-	-	1,050,000	1,372,524	595,624	534,497	598,613
Expenditures	-	-	-	-	-	-	224,876	1,388,172	595,624	486,029	598,613
Return on Investment							9.9:1	2.3:1	4.7:1	33.7:1	11.4:1
Higher Education in Rural Southern Arizona											
Revenue	-	-	-	-	-	-	500,000	742,885	622,923	622,923	34,383
Expenditures	-	-	-	-	-	-	-	315,800	622,923	588,540	34,383
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 the 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. Fernando Martinez**, Director, BIO5 Institute, Director, Arizona Respiratory Center, Regents' Professor and Swift-McNear Endowed Professor, Pediatrics

ACTREC: **Dr. Fernando Martinez**

BIO5: **Dr. Fernando Martinez**

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**, Vice Provost for Outreach and Global Initiatives

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

Nursing Online Programs: **Dr. Joan Shaver**, Dean, College of Nursing

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

Workforce Initiative: The Educator Development Plan: **Dr. Ronald Marx**

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

WATER AND ENVIRONMENTAL SUSTAINABILITY PROGRAM LEADER: **Dr. Sharon Megdal**, Director, WSP and Water Resources Research Center

Translational Environmental Research: **Dr. Jonathan Overpeck**, Co-Director, Institute of the Environment, Professor, Geosciences, and **Dr. Diana Liverman**, Co-Director, Institute of the Environment, Professor, Geography and Development

Water Sustainability: **Dr. Sharon Megdal**

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

HIGHER EDUCATION IN RURAL SOUTHERN ARIZONA: **Mr. Michael Proctor**, Vice Provost for Outreach and Global Initiatives

UA-ASU SOLAR ENERGY INITIATIVE: **Dr. Joseph Simmons**, Co-Director, AzRISE, Department Head and Professor, Materials Science and Engineering, and **Ms. Ardeth Barnhart**, Co-Director, AzRISE

VENTURE FUND: **Dr. Meredith Hay** and **Dr. Leslie P. Tolbert**

Advisory Boards: Each University of Arizona TRIF Initiative has its own Advisory Board, composed of experts in the community who 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.



TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

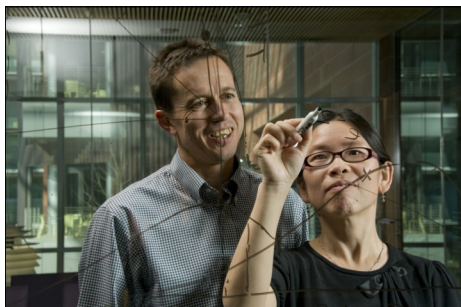
BIORESEARCH PROGRAM



Arizona's First University.

September 1, 2010

The TRIF UA Bioresearch Program concentrates multi-disciplinary efforts of faculty, students, and staff on a large spectrum of health issues. TRIF-supported scientists are seeking answers to increasingly complex problems: How do we prevent and cure cancer, diabetes, heart, neurological, and respiratory diseases? How can we feed more people with less impact on the environment? What technologies are needed to find these answers? How can we best prepare the next generation of scientists to carry forward this work into the future?



The TRIF UA Bioresearch Program 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 Fernando Martinez). Dr. Martinez has overall responsibility for the initiatives. Measures and goals are combined for all three.

The overall metrics for the three initiatives show continued fiscal integrity, significant and highly competitive grant-seeking efforts, and encouraging scientific progress in the face of urgent need.

Through focused efforts such as the new Clinical and Translational Science Institute (CTSI), the Bioresearch Program is creating statewide structures for clinical and translational research, applied biomedical informatics and enabling technologies. It is also providing financial support for collaborative groups of clinical and translational investigators and helping improve science education at all levels.

Teams of investigators are developing an array of methods aimed to reach the following goals: reduce the negative impact of aging; engineer diagnostic tools to help identify ovarian cancer in its earliest stages; examine the pervasive and deadly mechanisms of the most prevalent sexually transmitted diseases represented by the human papillomavirus; speed drug discovery with the Southwest's most comprehensive library of pharmaceutical compounds; and improve rice, the most important food crop for the increasing world population.

Through these and dozens of other crucial projects, the UA Bioresearch Program works to obtain research breakthroughs, translate them to applicable solutions so benefiting the citizens of Arizona and those of the world at large.

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Fernando D. Martinez, MD
Director, BIO5 Institute
Director ACTREC/CTSI
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	FY10 Actual	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	\$ 58.2	\$ 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	\$ 53.7	\$ 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	\$ 0.6	\$ 1.5
Other Awards								\$ 1.5	\$ 7.5	\$ 2.5	\$ 6.2	\$ 2.0	\$ 3.9	\$ 2.0
Gifts & Other Sources					\$0.2	\$1.1	\$1.4	\$ 1.2	\$ 1.3	\$ 1.3	\$ 1.6	\$ 1.4	\$ 1.9	\$ 1.5
TECHNOLOGY TRANSFER & COLLABORATIONS														
Invention Disclosures ¹		57	46	65	30	22	30	24	23	27	26	28	28	28
Licenses & Options ¹		75	17	25	7	4	4	5	4	6	11	7	8	8
Patent Applications	1	37	63	50	37									
New Start-up Companies					1	1	1	0	0	2	3	0	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	371	261
Graduate Trainees					290	254	300	266	380	280	347	293	335	318
Postdoctoral Trainees					137	154	148	146	161	150	156	151	135	158
New Faculty Hires	7	8	8	6	6	5	10	5	8	8	8	5	5	6
Clinical Scholars Circle Members						40	44	50	52	80	90	120	90	150
Number of Affiliate Clinical Partners in ACTREC						9	3	14	32	21	25	34	30	47
OUTREACH & EDUCATION														
Teachers/Educators Trained					220	113	289	200	730	200	750	200	362	200
K-12 Students Benefiting & Participating					35,082	9,175	45,342	30,000	40,007	30,000	42,036	30,000	29,227	30,000
Workshops, Seminars, & Conferences Supported ²	3	3	3	3	10	11	12	11	47	19	46	9	167	19

¹FY03 to FY06 activities include all UA Life Sciences; FY07 to FY10 and FY11 projections are Bioresearch activities only.

²In FY10, BIO5 participated significantly in the Tucson Festival of Books Science Pavilion

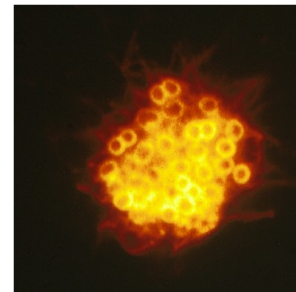
PERFORMANCE ANALYSIS

The Bioresearch Program funds are utilized to leverage additional resources in order to conduct cutting-edge basic and applied research, establish training programs, help move discoveries to market and therefore increase the number of businesses in Arizona, prepare students for careers in science, technology and medicine, and improve K-12 science education.

RETURN ON INVESTMENT (ROI)

The faculty working within the Bioresearch Program continue to be nationally competitive in garnering research dollars, including ARRA grants, in spite of very tight budgets. For example, BIO5 and Pharmacy faculty Christopher Hulme, in cooperation with TGen, obtained a \$7.5M RC2 grant, for a Southwest Comprehensive Center for Drug Discovery and Development.

The yearly \$1 million match from McKnight Brain Research Foundation provides a stable base for the McKnight Brain Institute. Through the CTSI, UA clinical and translational researchers are collaborating with colleagues at ASU and NAU to transform the way in which scientific discoveries are converted into products that citizens of Arizona can use to improve their lives.



TECHNOLOGY TRANSFER AND INDUSTRY COLLABORATION

Collaborations with the biotech industry facilitate interactions between faculty and students on one side and industrial scientists on the other. They also lower the barrier for commercialization of new products and processes as UA researchers continue to generate

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	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	\$ 356,613	\$ 356,613	\$ 919,914
New TRIF Revenue	\$ 4,837,623	\$ 4,803,518	\$ 5,251,866	\$6,976,943	\$ 5,811,155	\$ 6,644,563	\$ 6,753,985	\$ 5,861,117	\$6,014,911	\$ 5,791,156	\$ 5,885,919
Regents Innovation Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 350,000
TOTAL REVENUE	\$ 4,837,623	\$ 7,565,242	\$ 5,617,329	\$8,741,603	\$8,332,381	\$ 9,231,367	\$10,606,580	\$ 7,966,808	\$6,871,524	\$ 6,647,769	\$ 7,155,833
EXPENDITURES											
Personal Services	\$ 620,100	\$ 3,325,935	\$ 308,333	\$2,594,735	\$3,604,324	\$ 3,350,614	\$ 6,199,528	\$ 5,836,438	\$5,635,569	\$ 4,189,263	\$ 5,339,417
All Other Operating Expenses	\$ 1,195,799	\$ 3,713,844	\$ 1,544,336	\$1,475,642	\$2,353,434	\$ 2,359,151	\$ 3,115,606	\$ 1,150,634	\$ 735,955	\$ 1,190,156	\$ 1,466,416
Capital	\$ 260,000	\$ 160,000	\$ 2,000,000	\$2,150,000	\$1,687,819	\$ 169,007	\$ (316,028)	\$ 5,120	\$ -	\$ 5,184	\$ -
Regents Innovation Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,783	\$ 618,003	\$ 500,000	\$ 343,252	\$ 350,000
TOTAL EXPENDITURES	\$ 2,075,899	\$ 7,199,779	\$ 3,852,669	\$6,220,377	\$7,645,577	\$ 5,878,772	\$ 9,000,889	\$ 7,610,195	\$6,871,524	\$ 5,727,855	\$ 7,155,833
Return on Investment	0.7:1	2.2:1	6.6:1	4.3:1	3.5:1	6.4:1	5.2:1	9.8:1	5.2:1	11.2:1	5.4:1

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.

substantial invention disclosures and licenses in the life sciences. The BIO5 Institute continued to be a vital part of the bioindustry landscape in southern Arizona through research, fee for service/facility use and participation in AZBio/BIOSA. BIO5 is expanding its translational drug discovery work through the newly acquired former sanofi-aventis site in Oro Valley.

WORKFORCE CONTRIBUTIONS

A critical component of Arizona’s future is the development of a workforce that meets the needs of a growing bioscience and health industry. Our workforce initiatives, from junior 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. Community college and high school students, as well as their teachers, are introduced to cutting-edge university research. New graduate programs are training the next generation of interdisciplinary researchers and internships expose students to industry and laboratory settings. Examples of the newly established programs that bring together research faculty mentors and clinical scholars include the clinical scholar’s circle and translational scholars program.



K-12 SCIENCE AND MATH EDUCATION

To enhance K-12 science and math education, we provide teachers and students from Arizona schools with access to UA science and math resources and the opportunity to participate in hands-on research experiences. We lead workshops and symposia for teachers and provide classroom support to assist in implementing new and exciting curricula that meet state standards. Programs are externally reviewed and receive significant funding. For example, BIO5’s new Jr. Biotech program was established with \$0.75M from the Helios Foundation to bring hands-on biotechnology laboratory activities to middle school classrooms across the state.

EDUCATIONAL OUTREACH

Educational outreach continues through the McKnight Brain Institute seminar series and campus presentations from leading investigators in the field of aging. BIO5 produced the inaugural Science Pavilion at the Tucson Festival of Books, a community event attracting 80,000 attendees. Visitors experienced hands-on science activities and listened to presentations on a variety of subjects including wildlife conservation, water resources, and memory.

GOALS

- Conduct state-of-the-art interdisciplinary bioresearch and translate it into tangible human benefit.
- Foster collaborative research between UA faculty and researchers across 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, to bring 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 and ACTREC; **Carol Barnes** directs the McKnight Brain Institute.

BOARDS

The TRIF Bioresearch Program has a single oversight board consisting of three business leaders in the biotechnology industry. The Board reviews the reports from each of the three initiatives.

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; and **Joseph Jasinski**, PhD, Program Director, IBM Health Care & Life Sciences.

BIO5's External Business Advisory Board includes 14 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.

The McKnight Brain Institute's external review group is made up by 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 UA Provost and Vice President of Research, 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, Director, BIO5, and Director ACTREC/CTSI, The University of Arizona, at fernando@arc.arizona.edu or 520-626-4272. Visit the BIO5 website at www.bio5.org
- 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



OPTICAL SCIENCES AND TECHNOLOGY PROGRAM

September 1, 2010

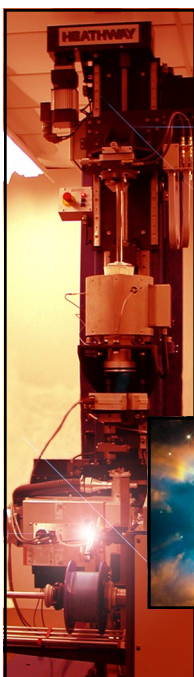
The University of Arizona College of Optical Sciences is home to the TRIF Optical Sciences and Technology Program. The program is multidisciplinary, with the College of Optical Sciences forming the core of the initiative. Through joint faculty appointments, cooperative research initiatives, and multidisciplinary outreach events, the 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.

Cooperative Research: Focuses on fiber optics technology, medical imaging, astronomy, optical engineering, high power lasers, generation and detection of information, photonic materials development, optoelectronic devices, biophotonic- and nanopore-based technology, materials development, quantum information technology, adaptive eyewear, and display, storage, processing, transmission, and simulation/modeling of information.

Multidisciplinary Outreach: Focuses on supporting outreach efforts with K-12 teachers and students and also supports the recruitment and retention of underrepresented students.

Industrial Support: Focuses on local, national, and international companies working in collaboration with OSC faculty to carry out long-range research in optics and photonics technologies.

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



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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	FY10 Actual	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	\$54,467	\$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	\$0.215	\$ 0.236
Patent Royalty Income						\$ 0.055	\$ 0.050	\$ 0.060	\$ 0.102	\$ 0.065	\$ 0.085	\$ 0.070	.084	\$ 0.075
WORKFORCE CONTRIBUTIONS														
New Faculty Hires	3	6	0	1	1	2	3	2	1	2	4	2	1	2
Growth in optics-related undergraduate enrollment	12	25	44	25	(12)	4	(40)	6	(5)	4	(3)	4	20	4
Growth in optics-related graduate enrollment	30	15	21	0	23	3	15	4	(4)	3	22	4	23	4
Growth in optics-related distance learning enrollment	3	48	32	32	23	5	(8)	8	(34)	8	(11)	2	(24)	2
TECHNOLOGY TRANSFER & COLLABORATIONS														
New Start-up Companies	2	1	0	0	1	0	0	1	1	0	2	0	3	1
Patent Applications	15	15	10	17	23	7	21	8	45	15	49	30	58	32
Invention Disclosures						25	27	27	30	29	34	31	39	33
OUTREACH & EDUCATION														
Workshops, Seminars and Conferences Supported	7	5	6	6	15	5	17	5	8	5	6	6	7	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 Royalty 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

R&D development in the TRIF Optical Sciences and Technology Program focuses on developing novel photonic and imaging/sensor components along with state of the art astronomical optics for projects that are designed for prototyping and/or proof-of-concept for early stage technologies. The increasing 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 UA. Projects include the development of two-year degree programs at community colleges, expansion of undergraduate/graduate and distance learning programs, graduate research fellowships, development of new courses geared to industry, and K-12 outreach.

Technology transfer and industry outreach is defined by collaborations with our optics industry

partners in the development and commercialization of new technology, affiliate sponsorships, development of industry related training courses and distance learning program, and new start-up companies.

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



June 2009: OSC faculty members, staff, and graduate students hosted a week-long optics camp for middle school students

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget
REVENUE											
Carry Forward	\$ -	\$ 1,535,952	\$ 324,825	\$ 366,298	\$ 1,230,225	\$ 135,586	\$ 594,471	\$ 852,429	\$ (72,014)	\$ (72,014)	\$ 53,937
New TRIF Revenue	\$ 4,395,646	\$ 4,803,518	\$ 4,521,523	\$ 4,491,847	\$ 4,047,769	\$ 3,646,492	\$ 3,598,915	\$ 2,718,259	\$ 2,656,045	\$ 2,390,440	\$ 2,390,440
TOTAL REVENUE	\$ 4,395,646	\$ 6,339,470	\$ 4,846,348	\$ 4,858,145	\$ 5,277,994	\$ 3,782,078	\$ 4,193,386	\$ 3,570,688	\$ 2,584,031	\$ 2,318,426	\$ 2,444,377
EXPENDITURES											
Personal Services	\$ 1,004,904	\$ 1,781,270	\$ 2,688,414	\$ 2,209,066	\$ 2,575,898	\$ 2,143,214	\$ 2,143,012	\$ 2,451,017	\$ 2,297,914	\$ 1,873,533	\$ 2,158,260
All Other Operating Expenses	\$ 854,790	\$ 3,233,375	\$ 791,636	\$ 418,854	\$ 1,566,510	\$ 1,044,393	\$ 1,197,945	\$ 1,191,685	\$ 286,117	\$ 390,956	\$ 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	\$ 3,642,702	\$ 2,584,031	\$ 2,264,489	\$ 2,444,377
Return on Investment	4.0:1	0.6:1	4.5:1	0.7:1	1.9:1	6.8:1	9.4:1	10.1:1	9.8:1	24.2:1	10.6:1

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:

- **Developing** new technologies in photonics, imaging and sensors, and astronomical optics.
- **Working** closely with industry and UA's Office of

Technology Transfer to identify research products that have potential for technology transfer.

- **Focusing** on under-represented populations to introduce them to optics careers.

(Continued on page 4)

GOALS

(Continued from page 3)

- **Increasing** the number of world-class faculty in optics and the number of major optics research projects.
- **Collaborating** with Arizona's optics industry to develop and commercialize new technology.
- **Growing** the number of optics-related spin-off

MANAGEMENT

Dr. James C. Wyant, Chair of the TRIF Optics Committee, reports to **Dr. Leslie Tolbert**, Vice President for Research,

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. **James T. Schwiegerling**: Associate Professor;

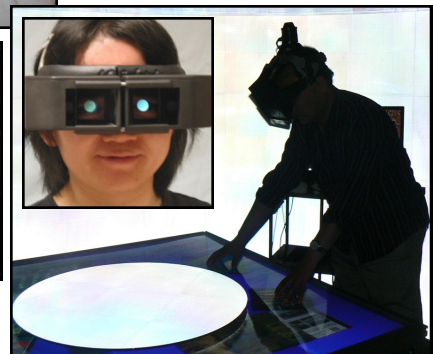
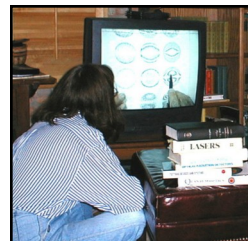
companies in Tucson and Arizona.

- **Supporting** workforce development through (1) continued expansion of instructional and outreach programs in K-12 and community colleges, (2) funding for graduate student fellowships in imaging and photonics, (3) continued expansion of the graduate, undergraduate, and distance learning programs, (4) development of new training programs and course curricula to meet industry needs, and (5) continued expansion of the graduate degree programs.

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



WATER AND ENVIRONMENTAL SUSTAINABILITY



Arizona's First University.

September 1, 2010

The Water & Environmental Sustainability Program (WESP) is a university-wide collaboration of researchers and educators working to leverage the University of Arizona's diverse expertise in water and the environment to develop innovative solutions to critical real-world resource challenges. Through the Water Sustainability Program (WSP) and Translational Environmental Research (TER) initiatives, WESP is conducting cutting-edge research, investing in state-of-the-art facilities, engaging industry and government partners, and translating knowledge to decision-makers, water and land managers, and the public. WESP's extensive outreach efforts this year have increased Arizona stakeholders' understanding of issues, such as climate disruptions, drought variability and preparedness, and the water-energy nexus, and laid the groundwork for collaboration with international partners. WESP continues to shape the next generation of leaders through K-12 water education programs, university research experiences, and new academic programs in water and environmental studies.



Research efforts generated a new high of over \$30M in sponsored funding in FY2010 including new major grants to: develop a national sensor network for weather forecasting and drought monitoring; quantify the coupling between water, climate, and land cover change; innovate remediation

technology to protect our water and air supplies; optimize water use in the nano-tech industries; and lead a national consortium examining algae biofuels. Additional highlights of WESP for this year include completion of a real-time water quality sensor lab and a state-of-the-art analytical lab that will serve users statewide to study and protect our environment.

WESP has been exemplary in orchestrating the creation of teams of faculty and students and providing the atmosphere and facilities conducive to world-class discovery, innovation and learning related to water and the environment. It is anticipated that the knowledge and techniques generated will have world-wide applications that stimulate the economy and produce far-reaching societal benefits.

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

PERFORMANCE MEASURES

RETURN ON INVESTMENT													
	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Actual	FY10 Proj	FY10 Actual	FY11 Proj
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	\$ 30.3
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	\$.205
TECHNOLOGY TRANSFER & COLLABORATIONS													
Licenses & Options ²							1	1	0	2	0	0	1
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	16
Graduate Trainees ⁶	1	16	54	75	89	85	68	95	98	95	77	59	48
Postdoctoral Trainees ⁷	2	2	3	3	3	4	8	7	6	7	5	5	4
New Faculty Hires	1	0	1	1	4	9	9	2	3	2	3	2	1
CURRICULUM INNOVATIONS & STUDENTS SERVED													
Number of Newly Revised Courses						1	1	1	1	1	2	1	1
OUTREACH & EDUCATION													
Teachers/Educators Trained ⁸	0	524	880	1,032	997	950	1,130	979	740	1,008	1,755	1,035	1,166
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	33,867
Communities Assisted ¹¹						5	7	10	9	10	12	10	26
Workshops, Seminars, & Conferences	1	1	1	1	2	4	5	6	13	6	15	11	43

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 Communities Assisted, FY10 Actual, are combined figures for WSP and TER. Previously only WSP figures.

¹² Workshops, Seminars & Conferences Supported, FY07 forward, are combined figures for WSP and TER. Previously only WSP figures.

* 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): Sponsored awards increased by approximately 50% in FY10 compared to FY09. Research teams were successful at securing approximately \$5.8M in Federal Stimulus funding. In addition, two large NSF grants obtained through cross-campus collaborative efforts contributed to the higher return.

Technology Transfer & Industry Collaboration: One Exclusive Patent License was executed and one Provisional Patent Application was filed by WESP researchers through the UA Office of Technology Transfer related to algae biofuels research that has been supported by WESP.

Workforce Contributions: There was a 78% reduction in the number of undergraduate trainees and a 38% decrease in graduate trainee positions attributed to budget shortfall and the suspension of the competitive grants program. Post-doctoral positions funded were down. Graduate student enrolment related to specific interdisciplinary environmental studies/earth sciences programs and the Water Policy Certificate program increased. New faculty hires were limited to one position in Hydrology & Water Resources due to budgetary constraints.

Curriculum Innovations: A new professionally oriented degree program in Water, Society and Policy was launched as the next extension of the Water Policy Certificate program. The new program will help to train a corps of leaders in water policy who understand both the science and social aspects of water.

Outreach & Education: Over 30,000 K-12 students and more than 1,000 teachers benefitted from water education programs focused on the central Arizona

region. New outreach initiatives led to an increase in the number of workshops, seminars and conferences offered to decision makers, researchers, professionals and the public. The number of Communities Assisted in Arizona more than doubled with the addition of TER's community outreach efforts.

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

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget
REVENUE											
Carry Forward	\$ -	\$ 442,080	\$ 95,320	\$ 437,798	\$ 595,950	\$ 689,983	\$ 1,861,545	\$ 853,293	\$ (53,628)	\$ (53,628)	\$ 247,189
New TRIF Revenue	\$ 474,283	\$ 480,352	\$ 2,009,566	\$ 2,460,948	\$ 3,907,500	\$ 4,645,467	\$ 3,993,114	\$ 3,360,110	\$ 3,283,206	\$ 2,954,885	\$ 2,954,885
TOTAL REVENUE	\$ 474,283	\$ 922,432	\$ 2,104,886	\$ 2,898,746	\$ 4,503,450	\$ 5,335,450	\$ 5,854,659	\$ 4,213,403	\$ 3,229,577	\$ 2,901,256	\$ 3,202,074
EXPENDITURES											
Personal Services	\$ 28,757	\$ 502,244	\$ 1,135,364	\$ 1,585,695	\$ 1,917,386	\$ 2,447,059	\$ 3,219,837	\$ 2,864,775	\$ 2,810,133	\$ 1,626,468	\$ 2,782,630
All Other Operating Expenses	\$ 3,446	\$ 324,868	\$ 531,724	\$ 717,101	\$ 1,336,400	\$ 1,026,846	\$ 1,751,464	\$ 1,407,349	\$ 419,444	\$ 1,027,599	\$ 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	\$ 4,267,031	\$ 3,229,577	\$ 2,654,067	\$ 3,202,074
Return on Investment	-	2.2:1	1.2:1	1.5:1	0.9:1	3.0:1	3.8:1	5.6:1	4.0:1	11.5:1	4.3:1

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.

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 and global leader in research and technology development.

WESP pursues its 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).



Co-Directors TER and the Institute for the Environment :
Diana Liverman, and Jonathan Overpeck

LEARN MORE

- Contact Dr. Sharon Megdal, WESP and WSP Director, smegdal@cals.arizona.edu or 520-621-9591. Visit the WSP website at: <http://www.wsp.arizona.edu>
- Contact Dr. Jonathan Overpeck, TER Co-Director, jto@email.arizona.edu or 520-626-4364; Dr. Diana Liverman, TER Co-Director, liverman@u.arizona.edu or 520-626-2910. Visit the TER website at: <http://environment.arizona.edu/ter>.
- Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, at tolbert@email.arizona.edu or 520-621-3513

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

Paul Brooks, Director, 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 and Translational Environmental Research

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.



TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

**EDUCATION AND INFRASTRUCTURE
PROGRAM**



Arizona's First University.

September 1, 2010

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.

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. 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. The College of Nursing is currently exploring online degree options with flexible scheduling and accelerated completion for working professionals.

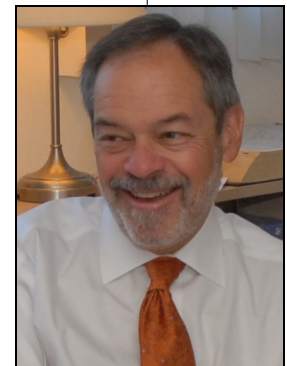
Anyplace Access for Arizonans (AAA) responds to workforce and workplace needs by exploiting information and communication technologies to offer the best of public higher education and outreach activities to all Arizonans, regardless of place. Participants seek knowledge and information for use in work 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 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 University Research Parks (OURP) and Office of Technology Transfer (OTT).

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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	FY10 Actual	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	8.807	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	1.341	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	.718	2.110
TECHNOLOGY TRANSFER & COLLABORATIONS														
Invention Disclosures	109	111	95	102	88	135	104	114	99	114	124	135	131	145
Licenses & Options	18	24	25	32	26	38	30	36	39	36	43	40	64	45
Patent Applications	62	77	91	106	109	105	121	115	143	115	125	120	119	125
New Start-up Companies	10	1	7	9	6	14	3	5	5	5	7	6	6	7
Economic Impact Studies	0	0	1	1	0	1	2	1	0	1	0	1	1	1
WORKFORCE CONTRIBUTIONS														
Number of Graduate Students Enrolled*			19	37	161	316	191	358	241	294	253	307	364	320
Number of Graduate Degrees Awarded						58	29	40	56	44	56	51	66	57
Teachers Certified in Undergraduate Level Math & Science	7	12	22	20	24	40	24	40	25	30	27	30	24	30
Teachers Certified in Master's Level Math & Science	28	25	26	40	24	30	24	30	14	25	14	25	15	25
Teachers Certified in Agriculture	8	13	16	16	12	15	11	17	13	19	17	20	17	20
Certificates granted for AAA + Nursing					9	50	0	58	85	84	12	105	20	128
CURRICULUM INNOVATIONS & STUDENTS SERVED														
Number of Newly Revised Courses Offered **				8	10	14	48	8	14	10	36	11	70	16
Number of Online Courses Offered	0	10	19	28	28	37	16	9	19	8	61	4	66	3
OUTREACH & EDUCATION														
K-12 Students Benefiting & Participating	2,150	2,500	3,200	3,800	3,000	4,250	2,950	8,600	2,600	13,300	2600	18,050	2,600	22,000
Workshops, Seminars, & Conferences Supported	0	0	1	1	2	2	4	0	0	0	0	0	21	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	298,751	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	3,322	2,904
DATA AND RESEARCH ACCESS & NETWORK														
Building Networks Brought to Standards						1	1	1	1	1	1	1	1	1
Supercomputer Usage						85-90%	90%	85-90%	78%	85-90%	94%	85-90%	96%	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	75th or better

*Although not part of the original metrics, the business plan was amended last year to include funding of undergraduate programs.

**FY10 actuals include courses in development or scheduled for Fall 2010 or Spring and Summer 2011.

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

PERFORMANCE ANALYSIS

Since its inception in 2001 the EDP has graduated 518 math, science, and agricultural science teachers for Arizona's schools. Graduates of the program have been recognized for their outstanding contributions to k-12 education through awards such as Rodell Foundation Exemplary Teacher, Arizona Teacher of the Year, Presidential Award for Excellence in Math and Science Teaching, and UA/Circle K Teacher of the Year. Every year these outstanding teachers reach thousands of K-12 students, thereby leveraging the TRIF investment for generations to come.

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 2002-10, 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 CC/ were made throughout fiscal years 2002 through 2010, 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.

GOALS

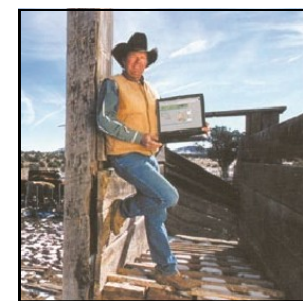
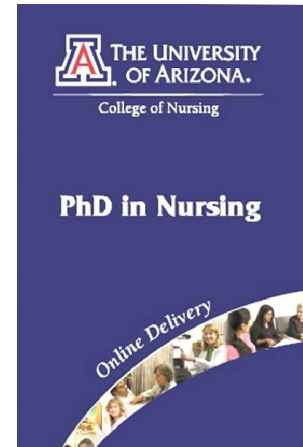
EDP – (1) To create seamless math and science programs from elementary through secondary school, (2) to support students to enter math, science, and agricultural science teacher preparation programs, (3) to graduate over 450 of these teachers and, (4) to support program graduates to teach locally.

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.

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



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



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

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget
REVENUE											
Carry Forward	\$ -	\$ 1,163,205	\$ 565,018	\$ 553,430	\$ 463,409	\$ 767,157	\$ 557,442	\$ 621,658		\$ 289,584	\$ 675,212
New TRIF Revenue	\$ 2,233,439	\$ 2,305,689	\$ 2,511,957	\$ 2,616,912	\$ 3,085,923	\$ 7,951,221	\$ 9,164,277	\$ 8,444,713	\$ 7,099,053	\$ 6,926,165	\$ 6,966,754
TOTAL REVENUE	\$ 2,233,439	\$ 3,468,894	\$ 3,076,975	\$ 3,170,342	\$ 3,549,332	\$ 8,718,378	\$ 9,721,719	\$ 9,066,371	\$ 7,388,638	\$ 7,215,749	\$ 7,641,966
EXPENDITURES											
Personal Services	\$ 415,210	\$ 1,355,810	\$ 1,628,344	\$ 1,915,393	\$ 1,760,808	\$ 2,026,007	\$ 2,114,858	\$ 2,105,147	\$ 2,385,367	\$ 1,662,214	\$ 2,312,812
All Other Operating Expenses	\$ 655,024	\$ 1,548,066	\$ 895,201	\$ 791,540	\$ 1,009,036	\$ 2,734,929	\$ 3,568,734	\$ 3,228,290	\$ 2,003,271	\$ 1,661,437	\$ 2,329,154
Capital	\$ -	\$ -	\$ -	\$ -	\$ 381,200	\$ 3,400,000	\$ 3,416,469	\$ 3,443,350	\$ 3,000,000	\$ 3,216,886	\$ 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	\$ 8,776,787	\$ 7,388,638	\$ 6,540,537	\$ 7,641,966
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.

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– **Joan Shaver**, Dean, College of Nursing

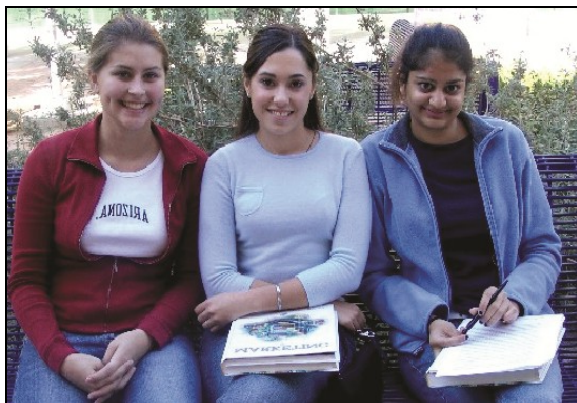
AAA– **Mike Proctor**, Dean, Outreach College

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.



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.



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.



UA-ASU SOLAR ENERGY INITIATIVE

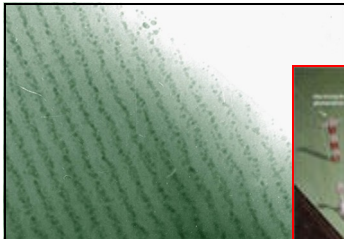
September 1, 2010



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. AzRISE works with industry and state offices to advance economic development in Arizona.

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.

AzRISE co-director Ardeth Barnhart near dish concentrator structure

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UA/AzRISE SEED[pod] Solar Decathlon House on the Mall in Washington, DC, one of 20 entries in the DOE competition, October 8-18, 2009

PERFORMANCE MEASURES

	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY10 Actual	FY11 Proj
RETURN ON INVESTMENT (\$ in millions)							
Sponsored Awards: (\$M)	\$ 1.17	\$ 2.18	\$ 1.75	\$ 2.50	\$ 2.20	\$16.14	\$ 5.80
Federal Awards	\$ 0.10	\$ 1.08	\$ 0.80	\$ 2.18	\$ 1.00	\$12.59	\$ 3.00
Industrial Awards	\$ 0.02	\$ 0.05	\$ 0.25	\$ 0.32	\$ 0.40	\$ 1.24	\$ 1.00
Other Awards	\$ 1.05	\$ 1.05	\$ 0.70	\$ -	\$ 0.80	\$ 2.31	\$ 1.80
Gifts & Other Sources	\$ 0.00	\$ 0.05	\$ 0.30	\$ 0.64	\$ 0.60	\$ 0.25	\$ 1.00
TECHNOLOGY TRANSFER & COLLABORATIONS							
Licenses & options	2	2	2	1	2	2	2
New Start-up Companies	0	0	1	2	2	0	3
Patent Applications	0	0	2	2	4	2	6
Invention Disclosures	0	0	4	6	8	1	12
WORKFORCE CONTRIBUTIONS							
Number of graduates in solar energy	4	2	10	20	20	22	30
Number of undergraduates in solar energy	20	20	26	27	26	31	26
Number of post doctoral associates	1	0	2	2	4	2	6
CURRICULUM INNOVATIONS & STUDENTS SERVED							
Number of newly revised courses offered	0	0	20	2	100	2	300
Number of Online Courses Offered	1	1	2	0	4	1	10
OUTREACH & EDUCATION							
Workshops, seminars and conferences supported	2	5	4	4	4	3	4

Grants Obtained:

- | | |
|-----------|------------------------------|
| 1) 5 DOE | 4) 17 Industry and Utilities |
| 2) 10 NSF | 5) 14 Foundation |
| 3) 6 DoD | 6) 2 Others |

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 obtained externally funded research awards, ROI and technology transfer transactions are direct measures of this activity.

Workforce Development is a major objective of AzRISE. Workforce development consist of increasing the numbers of graduate and undergraduate students doing research and taking courses in solar energy-related topics and on the development of new courses. Additional focus is on postdoctoral associates in solar energy research and on students in the new solar energy certificate program onsite and distance learning.

Technology Transfer and Industry Outreach is defined by collaborations with industry and utility partners in the



AzRISE Solar Racing Car Team

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.

GOALS

AzRISE 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 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget
REVENUE						
Carry Forward	\$ —	\$ 979,762	\$ 825,124	\$ (15,648)	\$ (15,648)	\$ 48,468
New TRIF Revenue	\$ —	\$ 70,238	\$ 547,400	\$ 611,272	\$ 550,145	\$ 550,145
TOTAL REVENUE		\$ 1,050,000	\$ 1,372,524	\$ 595,624	\$ 534,497	\$ 598,613
EXPENDITURES						
Personal Services	\$ —	\$ 148,944	\$ 956,765	\$ 519,224	\$ 334,115	\$ 498,613
All Other Operating Expenses	\$ —	\$ 75,932	\$ 431,407	\$ 76,400	\$ 151,914	\$ 100,000
Capital	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
TOTAL EXPENDITURES	\$ —	\$ 224,876	\$ 1,388,172	\$ 595,624	\$ 486,029	\$ 598,613
Return on Investment	-	9.9:1	2.3:1	4.7:1	33.7:1	11.4:1

MANAGEMENT

Dr. Joseph H. Simmons, and Ms. Ardeth M. Barnhart, co-directors of AzRISE, report 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; **Jeff Goldberg**, Dean, College of Engineering, **Joaquin Ruiz**, Dean, College of Science.

Technical Review Committee

Jonathan Overpeck, co-director of the Institute for the Environment; **Neal Armstrong**, Professor Chemistry and Optical Sciences, **Ardeth Barnhart**, Co-Director, AzRISE; **Eric Betterton**, Head and Professor, Atmospheric Sciences; **Dale Clifford**, Associate Professor, Architecture (Carnegie Mellon); **Pierre Deymier**, Director, School for Sustainable Engineered Systems; **Barrett Potter**, Professor, Materials Science and Engineering; **Stanley Reynolds**, Professor, Department of Economics.

External Advisory Committee

John Madocks, President, General Plasma, Inc.; **Dave Hutchens**, Vice President, Renewable Energy, Tucson Electric Power; **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; **Duane Dimos**, Sandia National Laboratory.

LEARN MORE

- Contact **Dr. Joseph H. Simmons**, co-Director, AzRISE, and Department Head, Materials Science and Engineering, at simmonsj@email.arizona.edu or 520-621-6071
- Contact **Ardeth Barnhart**, co-Director, AzRISE, at ardethb@email.arizona.edu or 520-322-2970
- Contact **Dr. Leslie Tolbert**, Vice President for Research, Graduate Studies, and Economic Development, at tolbert@email.arizona.edu or 520-621-3513
- Visit the AzRISE Website at www.AzRISE.org



AzRISE organized and sponsored **Arizona Leadership Summit on Solar Energy and Economics**, a statewide workshop supported by the 3 Arizona University Presidents, addressing, for the first time, critical policy issues in renewable energy for the State of Arizona - UA President Shelton at the podium opening the meeting.



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.



TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)

HIGHER EDUCATION IN RURAL SOUTHERN ARIZONA



Arizona's First University.

September 1, 2010

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The Higher Education in Rural Southern Arizona TRIF Initiative was funded in December 2007 from the Regents TRIF Innovation Fund 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 faculty, whether those faculty travel from main campus or serve multiple communities, and each community has access to online content for a broader menu than would normally be available in each community.



UA Santa Cruz

A collaborative effort between the University of Arizona and the citizens of Santa Cruz County.

PERFORMANCE MEASURES

	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY10 Actual	FY11 Proj
RETURN ON INVESTMENT							
Sponsored Awards ¹	\$ 0	\$ 0	\$ 100,000	\$ 124,925	\$ 150,000	\$ 722,063	\$ 150,000
Gifts & Other Sources	\$ 0	\$ 0	\$ 200,000	\$ 52,009	\$ 200,000	\$ 3,211	\$ 200,000
WORKFORCE CONTRIBUTIONS							
Number graduate students enrolled within initiative ²	0	0	2	130	4	222	8
Number graduate degrees awarded	0	0	1	0	2	0	4
Number of undergraduate degrees awarded	0	0	0	0	20	1	30
Number undergraduates enrolled ³	0	0	30	44	40	418	50
Total student credit hours produced	0	0	300	107	300	2,025	300
Number certificates granted for Higher Ed	0	0	15	0	20	11	30
Number new certificates offered ⁴	0	0	2	1	2	2	2
CURRICULUM INNOVATIONS AND STUDENTS SERVED							
Number of newly revised courses offered ⁴	0	0	2	2	4	24	6
Number new online courses offered ⁴	0	0	15	18	15	33	15
OUTREACH AND EDUCATION							
Teachers/Educators Trained	0	0	12	14	18	207	24
Number enrollments in web & hybrid	0	0	30	169	80	659	120

[1] Reflects a Federal Department of Labor workforce grant for FY08, FY09 and FY10 for Entrepreneurship (\$380,196), Engineering (\$210,934) and in articulating pathways and career ladders and developing STEM initiatives with regional high schools (\$130,933). In addition, grantees leveraged an additional \$37,229 of TRIF dollars from other TRIF grant programs.

[2] Includes enrollments from three programs that also received funding from other TRIF sources (Geospatial Information Science & Technology, Computer Science Online, and Introduction to Engineering).

[3] Also includes 14 high school students enrolled in a three-credit communication class through Outreach College.

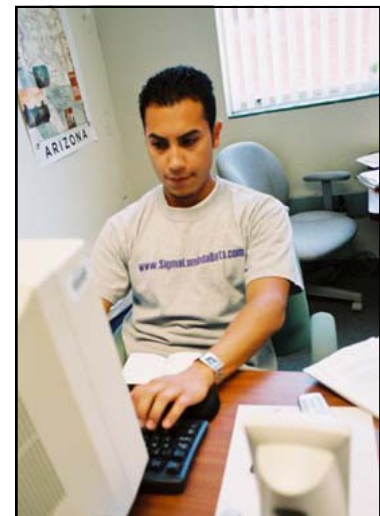
[4] Includes programs that also received leveraged support from other TRIF sources.

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 available online region-wide; Lesson Link, a teacher resource program; and online science teacher preparation courses.

We also used this funding to leverage a successful Department of Labor grant for regional economic development, allowing us to dramatically expand online content over the last two years in several critical programs, significantly increasing access for time- and place-bound students throughout the region. As a result, enrollments for FY10 for most programs far exceeded projections.



A most notable achievement this year is the graduation of our first undergraduate student and the certification of sixteen teachers in Nogales, the latter made possible through the UA South Arizona Educators Proficiency Test Preparation course.



Other successes include 222 graduate students in various education, business and information science courses; 150 undergraduate students enrolled in the Eller Online Certificate Program in Business Communication; an additional 36 teachers enrolled in courses designed to better prepare them to teach science; and the continued success of Lesson Link, with 50 teachers/educators trained and 1,292 users of this electronic resource for Southern Arizona teachers.

FINANCIAL INFORMATION

	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget
REVENUE						
Carry Forward	\$ -	\$ -	\$ 500,000	\$ 427,085	\$ 622,923	\$ 34,383
New TRIF Revenue	\$ -	\$ 500,000	\$ 242,885	\$ 195,838	\$ -	\$ -
TOTAL REVENUE		\$ 500,000	\$ 742,885	\$ 622,923	\$ 622,923	\$ 34,383
EXPENDITURES	\$ -					
Personal Services	\$ -	\$ -	\$ 118,218	\$ 622,923	\$ 453,770	\$ 34,383
All Other Operating Expenses	\$ -	\$ -	\$ 197,582	\$ -	\$ 134,770	\$ -
Capital	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL EXPENDITURES	\$ -	\$ -	\$ 315,800	\$ 622,923	\$ 588,540	\$ 34,383
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.

GOALS

Aside from relevant graduate programs, a primary goal of this initiative is to provide, through integrated four-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 by FY 2010, but enrollments in funded courses exceeded that by five times this year. We expect that this measurable increase in enrollments will make a significant contribution to meeting Arizona's demand for an educated workforce. We also expect enrollments to continue to grow, perhaps slowing somewhat in teacher education programs due to economic conditions, but advancing significantly in defense, intelligence and security programs available throughout the region. Clearly, these successes would not have happened without this regionally-focused investment by the Arizona Board of Regents.

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 Dean of Outreach's advisory board, a mix of internal and external individuals who are charged with evaluating the broad strategy of the Outreach College. 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 Dean of the Outreach College.

LEARN MORE

- Contact **Mike Proctor**, Dean, University of Arizona Outreach College, The University of Arizona, at mproctor@arizona.edu or 520-626-5531.
- 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 research.arizona.edu for more information on the individual initiatives.

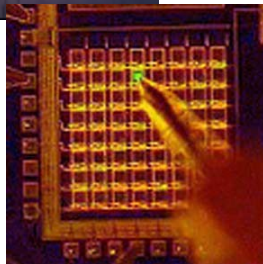


VENTURE FUND



Arizona's First University.

September 1, 2010



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.

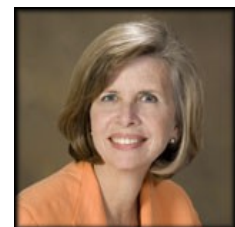
The Venture Fund is overseen by the Executive Vice President and Provost and the Vice President for Research, Graduate Studies, and Economic Development of the

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



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

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.

PROJECTS FUNDED IN FY 2010

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 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget
Carry Forward	\$ -	\$ 68,123	\$ 487,543	\$ 172,779	\$ 143,603	\$ 54,420	\$ 54,420	\$ 27,775
New TRIF Revenue	\$ 68,123	\$ -	\$ 714,079	\$ 430,455	\$ 29,953	\$ 5,580	\$ -	\$ -
TOTAL REVENUE	\$ 68,123	\$ 68,123	\$1,201,622	\$ 603,234	\$ 173,556	\$ 60,000	\$ 54,420	\$ 27,775
EXPENDITURES								
Personal Services	\$ -	\$ -	\$ 891,417	\$ 457,864	\$ 94,207	\$ 60,000	\$ 25,181	\$ (26,645)
All Other Operating Expenses	\$ -	\$ 68,123	\$ 137,426	\$ 1,767	\$ 24,929	\$ -	\$ 1,464	\$ 54,420-
Operations	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL EXPENDITURES	\$ -	\$ 68,123	\$1,028,843	\$ 459,631	\$ 119,136	\$ 60,000	\$ 26,645	\$ 27,775

*\$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



Expansion of the Phoenix Biomedical Campus The University of Arizona

September 1, 2010

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 cover 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

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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ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGETS
SUMMARY

	FY 2007 ACTUAL	FY 2008 ACTUAL	FY 2009 ACTUAL	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE						
Carryforward	\$ 1,277,429	\$ 1,280,867	\$ 1,001,977	\$ 939,878	\$ 744,042	\$ 415,291
TRIF Revenue	4,916,171	2,050,760	1,507,934	884,400	837,254	959,709
TOTAL REVENUE	\$ 6,193,600	\$ 3,331,627	\$ 2,509,911	\$ 1,824,278	\$ 1,581,296	\$ 1,375,000
EXPENDITURES						
OPERATING BUDGET						
Personal Services	\$ 154,893	\$ 131,974	\$ 150,596	\$ 190,000	\$ 155,114	\$ 104,500
ERE	42,970	39,445	46,707	53,000	49,144	27,000
All Other Operating	63,849	162,185	161,579	171,596	96,927	21,247
TOTAL OPERATING BUDGET	261,712	333,604	358,882	414,596	301,185	152,747
GRANTS/PROJECTS						
Regents Innovation Fund	1,119,236	1,207,048	1,046,879	790,585	522,453	1,035,000
Arizona Regents Reach Out (ARRO) Grants	443,404	495,289	224,272	423,259	342,367	187,253
TRIF Strategic Investments (TSI) Carryforward to FY 2010/2011	250,000	-	-	195,838	-	-
TOTAL GRANTS/PROJECTS	1,812,640	1,702,337	1,271,151	1,409,682	864,820	1,222,253
EXPENDITURES GRAND TOTAL	\$ 2,074,352	\$ 2,035,941	\$ 1,630,033	\$ 1,824,278	\$ 1,166,005	\$ 1,375,000
SUMMARY BY INITIATIVE						
Regents Innovation Fund ¹	\$ 1,265,329	\$ 1,434,503	\$ 1,316,863	\$ 1,060,585	\$ 738,504	\$ 1,175,000
Arizona Regents Reach Out (ARRO) Grants	559,023	601,438	313,170	539,934	427,501	200,000
TRIF Strategic Investments (TSI) ² Carryforward to FY 2010/2011	250,000	-	-	223,759	-	-
EXPENDITURES GRAND TOTAL	\$ 2,074,352	\$ 2,035,941	\$ 1,630,033	\$ 1,824,278	\$ 1,166,005	\$ 1,375,000

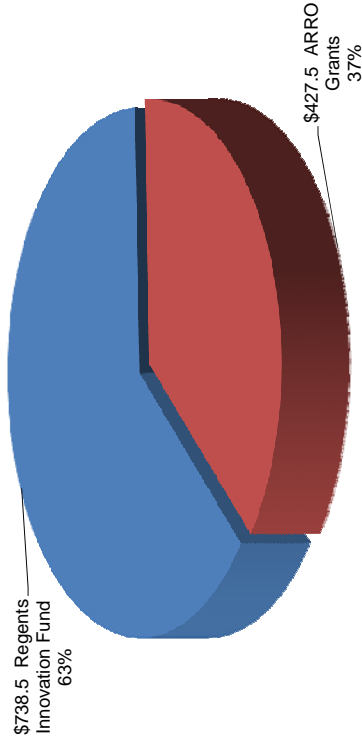
¹ To avoid double counting, above FY 2008 and FY 2009 amounts do not include \$500,000, and FY 2010 and FY 2011 amounts do not include \$325,000, of Regents Innovation Fund revenue and expenditures that were/will be allocated to UA for HRAA CTSA and are included in UA's reports. These amounts are included, however, on the Emerging Issues page in the Regents Innovation Fund section.

² The final TSI allocation to the universities was made in FY 2010. FY 2010 TSI revenues and expenditures are not included in these ABOR system office numbers but are included in the universities' reports.

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 BUDGET / ACTUAL
SUMMARY BY PROGRAM AREA

	FY 2010 REVISED BUDGET	FY 2010 ACTUAL
REVENUE		
Carryforward	\$ 939,878	\$ 744,042
TRIF Revenue	\$ 884,400	\$ 837,254
TOTAL REVENUE	\$ 1,824,278	\$ 1,581,296
EXPENDITURES		
OPERATING BUDGET		
Personal Services	\$ 190,000	\$ 155,114
ERE	\$ 53,000	\$ 49,144
All Other Operating	\$ 171,596	\$ 96,927
TOTAL OPERATING BUDGET	\$ 414,596	\$ 301,185
GRANTS/PROJECTS		
Regents Innovation Fund	\$ 790,585	\$ 522,453
Arizona Regents Reach Out (ARRO) Grants	\$ 423,259	\$ 342,367
TRIF Strategic Investments (TSI) Carryforward	\$ 195,838	\$ -
TOTAL GRANTS/PROJECTS	\$ 1,409,682	\$ 864,820
EXPENDITURES GRAND TOTAL	\$ 1,824,278	\$ 1,166,005

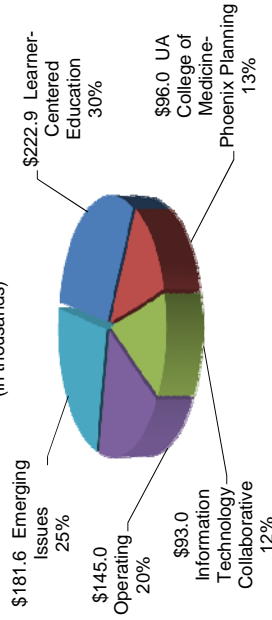
FY 2010 CENTRAL OFFICE ACTUAL TRIF EXPENDITURES
(in thousands)



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

	FY 2010 REVISED BUDGET	FY 2010 ACTUAL
REVENUE		
Carryforward	\$ 270,000	\$ 222,928
TRIF Revenue	\$ 110,000	\$ 96,000
TOTAL REVENUE	\$ 380,000	\$ 318,928
EXPENDITURES		
OPERATING BUDGET		
Personal Services	\$ 180,000	\$ 92,963
ERE	\$ 350,585	\$ 181,649
All Other Operating	\$ 150,000	\$ 144,964
TOTAL OPERATING BUDGET	\$ 680,585	\$ 419,576
GRANTS/PROJECTS		
Regents Innovation Fund	\$ 1,060,585	\$ 738,504
Arizona Regents Reach Out (ARRO) Grants	\$ 539,934	\$ 427,501
TRIF Strategic Investments (TSI) Carryforward	\$ 223,759	\$ -
TOTAL GRANTS/PROJECTS	\$ 1,824,278	\$ 1,166,005
EXPENDITURES GRAND TOTAL	\$ 1,824,278	\$ 1,166,005

REGENTS INNOVATION FUND
(in thousands)



ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGETS
REGENTS INNOVATION FUND SUMMARY

	FY 2010 REVISED BUDGET	FY 2010 ACTUAL	FY 2011 REVISED BUDGET
REVENUE			
Carryforward	\$ 376,185	\$ 376,185	\$ 313,610
TRIF Revenue	684,400	675,930	861,390
TOTAL REVENUE	\$ 1,060,585	\$ 1,052,115	\$ 1,175,000
EXPENDITURES			
OPERATING BUDGET			
Personal Services	\$ 110,000	\$ 103,366	\$ 100,000
ERE	28,000	27,520	25,000
All Other Operating	132,000	85,165	15,000
TOTAL OPERATING BUDGET	270,000	216,051	140,000
GRANTS/PROJECTS			
Learner-Centered Education	150,000	151,841	-
The University of Arizona College of Medicine-Phoenix Planning	110,000	96,000	110,000
Information Technology Collaborative	180,000	92,963	200,000
Emerging Issues	350,585	181,649	725,000
TOTAL GRANTS/PROJECTS	790,585	522,453	1,035,000
EXPENDITURES GRAND TOTAL	\$ 1,060,585	\$ 738,504	\$ 1,175,000
SUMMARY BY INITIATIVE			
Learner-Centered Education	\$ 270,000	\$ 222,928	\$ -
The University of Arizona College of Medicine-Phoenix Planning	110,000	96,000	110,000
Information Technology Collaborative	180,000	92,963	200,000
Emerging Issues	350,585	181,649	725,000
Operating	150,000	144,964	140,000
EXPENDITURES GRAND TOTAL	\$ 1,060,585	\$ 738,504	\$ 1,175,000

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
REGENTS INNOVATION FUND
Learner Centered Education Course Redesign Initiative (LCE-CRI)

	<i>FY 2010 REV BUDGET</i>	<i>FY 2010 ACTUAL</i>	<i>FY 2011 BUDGET</i>
REVENUE			
Carry Forward	\$ 244,780	\$ 244,780	\$ -
TRIF Revenue	25,220	24,907	-
TOTAL REVENUE	\$ 270,000	\$ 269,687	\$ -
EXPENDITURES			
OPERATING BUDGET			
Personal Services	\$ -	\$ -	\$ -
ERE	-	-	-
All Other Operating (NCAT Contract)	120,000	71,087	-
Subtotal Operating Budget	120,000	71,087	-
GRANTS/PROJECTS:			
FY 2010 LCE Grants	150,000	149,998	-
Prior-year Grants	-	1,843	-
Subtotal Grants/Projects	150,000	151,841	-
EXPENDITURES GRAND TOTAL	\$ 270,000	\$ 222,928	\$ -

LEARNER CENTERED EDUCATION



September 1, 2010

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.

2002-2006: The First Five Years

From 2002 through 2006, 11 to 20 faculty grants were awarded annually for projects addressing learner-centered education in the areas of faculty development; course modification; assessment; or research.

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 Intuition in Math for Engineering Success, NAU), which tested online training activities and tools designed to improve student performance in their entry-level engineering foundation courses.

Contents

2002-2006: The First Five Years	1
2007-2009: LCE Course Redesign Initiative	3
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(Continued on page 3)

LEARNER-CENTERED EDUCATION AWARDS 2002-2010

LCE AWARDS, 2002-2010								
	2002-2006 (5 FUNDING CYCLES)		2007-2009 LCE CRI		2010 LEVERAGE GRANTS		TOTAL 2002-2010	
	#	\$	#	\$	#	\$	#	\$
ASU	21	\$574,224	8	\$390,878	1	\$50,000	30	\$1,015,102
NAU	23	\$597,650	2	\$74,711	1	\$49,997	26	\$722,358
UA	26	\$645,070	3	\$150,242	1	\$50,000	30	\$845,312
NAU/UA	1	\$24,883	-	0	-	0	1	\$24,883
ASU/UA	0	0	-	0	-	0	0	0
NAU/ASU	1	\$99,400	-	0	-	0	1	\$99,400
TRI-U	5	\$540,123	-	0	-	0	5	\$540,123
TOTALS:	77	\$2,481,350	13	\$615,831	3	\$149,997	93	\$3,247,178

*Learner-centered education has been a high priority for the Arizona Board of Regents,
as reflected in the Arizona University System's Strategic Directions*

LCE YEAR-BY-YEAR FINANCIALS, 2002-2010

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 BUDGET	FY 2010 ACTUAL
REVENUE										
Carry Forward	-	\$ 297,864	\$ 307,772	\$ 293,560	\$ 18,965	\$531,621	\$ 418,027	\$300,000	\$244,780	\$244,780
TRIF Revenue ¹	969,239	560,008	16,500	500,000	101,428	300,000	428,222	387,750	25,220	25,220
TOTAL REVENUE	\$ 969,239	\$ 57,872	\$ 824,272	\$ 93,560	\$ 820,393	\$831,621	\$ 846,249	\$687,750	\$270,000	\$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	139,718	120,000	71,086 ²
Subtotal Operating	\$ 6,326	\$ 0,677	\$ 2,977	\$ 7,583	\$ 13,292	\$ 40,768	\$ 137,544	\$139,718	120,000	\$71,086
GRANTS/PROJECTS:										
FY 2002-06 LCE Grants	\$ 567,107	\$ 554,488	\$ 14,212	\$ 454,666	\$ 264,880	\$339,360	\$ (36,524)	-	-	(3,845)
FY 2007 LCE Grants	-	-	-	-	-	-	-	-	-	5,689
FY 2008 LCE Grants	-	-	-	-	-	-	345,426	269,930	-	-
FY 2009 LCE Grants	-	-	-	-	-	-	-	-	-	-
FY 2010 LCE Grants	-	-	-	-	-	-	-	-	150,000	149,998
Subtotal Grants/Projects	\$567,107	\$ 554,488	\$ 514,212	\$ 454,666	\$ 264,880	\$339,360	\$ 308,902	\$269,930	\$150,000	\$151,842
EXPENDITURES, GRAND TOTAL	\$ 573,433	\$ 575,165	\$ 527,189	\$ 462,249	\$ 278,172	\$410,128	\$ 446,446	\$409,648	\$270,000	\$222,928

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)

LCE PROGRAM PERFORMANCE MEASURES / DELIVERABLES							
	2002	2003	2004	2005	2006	2007 –2009	2010 (est.)
Number of courses modified to LCE focus	95	123	104	68	72	10	11
Faculty addressing curriculum through LCE grants	188	147	111	141	133	65	33
Students affected by LCE grant projects	14,000	5,362	6,392	8,491	10,500	20,000-25,000 annually	3,600

(Continued from page 1)

2007-2009: LCE Course Redesign Initiative

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) focused on the redesign of large-enrollment, multi-section “gateway” 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

In June 2009 Dr. Carol Twigg, President of NCAT, reported on the 10 redesigned courses and the project results, which demonstrated measurable improvements in student learning and course completion rates. In addition:

- Total annual enrollment in the redesigned courses was estimated at more than 21,000 students.
- Using NCAT’s calculations, the redesigns saved some \$1.2 million in instructional costs, averaging cost reductions of \$93 - or 37% - per student.

- Faculty participating in the LCE CRI grant cycle were enthusiastic about providing leadership within their institutions to apply the LCE CRI redesign model to additional courses.

“The impressive learning outcomes and cost savings of the [NAU Psychology] redesign have resulted in the placement of one of the team members as a campus redesign scholar, to continue the university’s efforts to improve student learning and foster a campus community of individuals interested in active-learning approaches.”
 -- NCAT final report, June 2009

2010: LCE Leverage Grants

According to the Regents’ direction, the 2010 LCE grant funding was to directly leverage, expand, or build on the strategies, resources, tools, and/or expertise developed in the two-year LCE Course Redesign Initiative program. Due

to overall economic pressures, funding for the FY 2010 LCE round was limited to \$150,000.

The LCE Advisory Council, with input from other stakeholders, developed the framework for the “LCE CRI Leverage Grants.” The non-competitive process was based on each university addressing the following:

How would your university use \$30,000 to \$50,000 between January 1 and August 31, 2010, to leverage, integrate, consolidate, and/or disseminate the results of ABOR’s investment in the recently completed LCE CRI process?

The projects began with the Regents’ approval in January 2010 and will conclude December 31, 2010. The three projects are summarized on page 4.

2010 LCE Course Redesign Initiative Leverage Grant Projects

Arizona State University (\$50,000):

In its 2010 LCE project, ASU is adapting the lessons from its LCE CRI redesign of the general chemistry course to a first-year math course as a pilot project, the first step in redesign of ASU's entire first-year math curriculum, from college algebra to calculus. The team has learned that students who succeed with a C or better in their first math course are far more likely to be retained and graduate—thus the importance of

improving success in math across the first-year curriculum. In the pilot redesign, some 400 students in three sections of College Algebra use software that performs progressive diagnostics on math skills and increases time on task. Groups of students are also engaging in weekly recitation sessions, working through guided problem-solving sessions under the direction of trained instructors.

Northern Arizona University (\$49,998):

NAU's Leverage Grant supports its Course Redesign team to: (1) refine its process and support systems for redesign; (2) disseminate results of recent redesigns; and (3) begin Phase I of redesigning several courses. The NAU Course Redesign Team, a direct outgrowth of the NCAT LCE CRI program, includes experts in assessment, student academic support, instructional design, instructional technology, and

library/information resources. Leverage Grant activities launched with a mini-conference showcasing the NCAT-inspired redesign process and successful course redesigns. Participants explored the benefits and feasibility of specific course redesigns. The NAU e-Learning Center is now supporting four projects to pilot new redesigns in Information Systems, Computer Science, History, and Communications.

University of Arizona (\$50,000):

The UA is providing matching funds to establish online course archives that include information on LCE principles and instructional materials developed with LCE CRI funding. These resources are being promoted through workshops for department heads, teaching assistants, and new faculty. In addition, the UA's LCE CRI award supports five mini-grants of \$10,000

for faculty and staff to replicate LCE reforms. The focus of the redesign projects is not just on gateway courses but also on upper division courses that can create delays in progress to graduation. These instructional resources are being developed in collaboration with NAU and ASU staff to leverage the materials that have been created at all three institutions.

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.

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, reviews proposals, and recommends projects for funding to the AAC.

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 at the Arizona Board of Regents website, www.azregents.edu, under "Special Programs and Initiatives" on the home page.
- 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 SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
REGENTS INNOVATION FUND

The University of Arizona College of Medicine-Phoenix Planning

	<i>FY 2010 REV BUDGET</i>	<i>FY 2010 ACTUAL</i>	<i>FY 2011 BUDGET</i>
REVENUE			
Carry Forward	-	-	-
TRIF Revenue	110,000	108,636	110,000
TOTAL REVENUE	\$ 110,000	\$ 108,636	\$ 110,000
EXPENDITURES			
OPERATING BUDGET			
Personal Services	-	-	-
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
GRANTS/PROJECTS:			
Molera Alvarez Group	110,000	96,000	110,000
Subtotal Grants/Projects	110,000	96,000	110,000
EXPENDITURES GRAND TOTAL	\$ 110,000	\$ 96,000	\$ 110,000

THE UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE-PHOENIX PLANNING

FY 2010 RESULTS AND ACCOMPLISHMENTS

FY 2010 TRIF funds were expended in support of the planning for the development of The University of Arizona College of Medicine-Phoenix 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 and another 48 in July 2010, requiring more classroom space at the Mercado and bringing total enrollment in the College of Medicine-Phoenix to 168 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. Phase Two projects will provide teaching space needed to expand the College to its full capacity of 120 first-year students each year. 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 parking for at least 500 cars. The total estimated square footage for Phase Two is approximately 597,000 GSF, not including parking. The team of CO Architects and Ayers Saint Gross is proceeding with the detailed programming requirements for ABC 2. Meeting with some dozen user groups and oversight committees, the project team will verify and refine requirements, as well as determine with the users how facilities and services might be shared among programs.

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 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 263,000 GSF. Ground was broken on May 12, 2010; anticipated construction completion is May 2012, with opening in July 2012 in time to admit entering and returning students, including a first-ever first-year class of 80.

As part of the HSEB project, a 20,000 GSF vivarium is being constructed to support ABC 1, funded by a \$15 million grant from the National Institutes of Health (NIH).

Arizona Biomedical Collaborative 2 (ABC 2) Research Building

Arizona Biomedical Collaborative 2 (ABC 2) will accommodate approximately 50 principal investigators from UA 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 310,000 GSF. Construction of ABC 2 and the research cores will be completed about a year after HSEB, contingent upon the availability of funding.

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 2011 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 by the UA College of Medicine, 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 reassessing 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, is underway and scheduled for completion in Fall 2010.

FY 2011 GOALS/OBJECTIVES

1. Continue construction of Health Sciences Education Building (HSEB).
2. Complete planning, programming, and design of ABC 2.
3. Complete reassessment of PBC capacity.

FY 2010 ACTUAL/FY 2011 PROJECTED PERFORMANCE MEASURES/DELIVERABLES

	FY 2010 Projected	FY 2010 Actual	FY 2011 Projected
Return on Investment			
1. Complete planning, programming, and design of HSEB.	Completed	Completed	-
2. Begin construction of HSEB.	Fall 2009	Spring 2010	-
3. Complete planning, programming, and design of ABC 2.	In progress	Ongoing	Completed
4. Complete reassessment of PBC capacity.	-	-	Completed
Partnerships/Collaborations			
5. Continue collaborative effort among UA and NAU.	Ongoing	Ongoing	Ongoing
6. Continue collaborative effort with City of Phoenix.	Ongoing	Ongoing	Ongoing

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
REGENTS INNOVATION FUND
Information Technology Collaborative

	FY 2010 REV BUDGET	FY 2010 ACTUAL	FY 2011 BUDGET
REVENUE			
Carry Forward	-	-	-
TRIF Revenue	180,000	180,000	200,000
TOTAL REVENUE	\$ 180,000	\$ 180,000	\$ 200,000
EXPENDITURES			
OPERATING BUDGET			
Personal Services	-	-	-
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
GRANTS/PROJECTS:			
SharePoint Project	-	8,191	-
Collaborative Supercomputing	-	(23,410)	-
Moran Consulting	100,000	108,182	100,000
Consulting contract for evaluation of universities' IT risk assessments			100,000
Projects to be determined	80,000	-	-
Subtotal Grants/Projects	180,000	92,963	200,000
EXPENDITURES GRAND TOTAL	\$ 180,000	\$ 92,963	\$ 200,000

INFORMATION TECHNOLOGY COLLABORATIVE

FY 2010 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 continues to facilitate The University of Arizona's Mosaic project implementation, which includes Human Resources, Student Administration, Research Administration, and Financial and Business Intelligence systems. SharePoint for the ABOR central office continues to be developed, and a new Arizona Board of Regents website was successfully launched. 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 2010 GOALS/OBJECTIVES

1. Continue implementation of SharePoint.
2. Redesign Arizona Board of Regents website.
3. Oversee consultant for Mosaic implementation at UA.
4. Continue providing status reports on the Tri-University Identity Federation project to the Technology Oversight Committee.

FY 2010 PERFORMANCE MEASURES/DELIVERABLES

	<i>Projected</i>	<i>Actual</i>
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	Completed
3. Moran consulting on UA Mosaic project.	On Schedule	Ongoing
Partnerships/Collaborations		
4. Reporting on the Tri-University Identity Federation project	On Schedule	Complete

FY 2010 RESULTS AND ACCOMPLISHMENTS

1. There was continued development of various Board Committee SharePoint sites, including Legal, Audit, Capital, Technology Oversight, and Academic Affairs. The Capital Projects database system continues to be developed. 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. The website was successfully launched in May 2010.
3. Moran Technology Consultants 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 were provided to the Technology Oversight Committee. This project has been successfully implemented.

FY 2011 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 beginning August 1, 2008. This contract will end July 31, 2011.

A consultant will be engaged to evaluate the universities' IT risk assessments and to make recommendations to close any gaps in IT security.

FY 2011 GOALS/OBJECTIVES

1. Oversee consultant for monitoring the UA Mosaic system implementation.
2. Engage consultant to evaluate universities' IT risk assessments.

FY 2011 PERFORMANCE MEASURES/DELIVERABLES

		<i>Projected</i>
	Return on Investment	
1.	Oversee consulting services for monitoring the UA Mosaic systems implementation.	Complete
	Partnerships/Collaborations	
2.	Oversee consulting services for evaluating universities' IT risk assessments.	Complete

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
REGENTS INNOVATION FUND
Emerging Issues

	<i>FY 2010 REV BUDGET</i>	<i>FY 2010 ACTUAL</i>	<i>FY 2011 BUDGET</i>
REVENUE			
Carry Forward	\$ 131,405	\$ 131,405	\$ 313,610
TRIF Revenue	719,180	714,247	736,390
TOTAL REVENUE	\$ 850,585	\$ 845,652	\$ 1,050,000
EXPENDITURES			
OPERATING BUDGET			
Personal Services	\$ -	\$ -	\$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	-	-	-
GRANTS/PROJECTS:			
Health Research Alliance Arizona CTSA (UA) ¹	500,000	500,000	325,000
Advancing Arizona through a Web-based Initiative (CFA) ²	65,000	65,000	165,000
Algebra II Assessment Pilot	15,000	15,000	-
Consulting services relating to federal stimulus funds	60,000	60,000	-
National Student Clearinghouse Data Exchange	-	41,649	50,000
Projects to be determined	210,585	-	510,000
Subtotal Grants/Projects	850,585	681,649	1,050,000
EXPENDITURES GRAND TOTAL	\$ 850,585	\$ 681,649	\$ 1,050,000

¹ HRAA CTSA funds are allocated directly to UA 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 System Office Summary page.

² FY 2011 Regents Innovation Fund support will be augmented by \$60,000 of NAU AZUN funding for total TRIF support of \$225,000 to this Center for the Future of Arizona (CFA) initiative.

**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, 2010

1. INITIATIVE DESCRIPTION

1.1. NIH Roadmap:

The NIH Roadmap for Biomedical Research established three themes around which medical research of the future is to be planned:

- i. "New Pathways to Discovery," stimulating the development of novel approaches to the study of complex biological systems.
- ii. "Research Teams of the Future," exploring ways to reduce the cultural and administrative barriers that often impede highly innovative research.
- iii. "Re-Engineering the Clinical Research Enterprise," intended to renovate translational and clinical science and apply medical discoveries directly to the needs of human beings.

1.2. UA ACTREC:

The purpose underlying the third Roadmap theme, Re-Engineering the Clinical Research Enterprise, is to maximize the societal value derived from promising science discoveries and, importantly, to achieve substantial reductions in the 17-year period that is typically required to take a novel laboratory finding from initial discovery to adoption as part of usual clinical care. To this end, the NIH National Center for Research Resources (NCRR) developed the Clinical and Translational Science Awards (CTSA) mechanism, through which it expects eventually to fund 60 academic centers.

In 2006, a planning grant, led by the UA and TGen, was funded by NIH to support development of an Arizona statewide CTSA. Building on the planning grant, ACTREC was formed to coordinate the organization of a statewide collaboration to advance clinical and translational research and research training programs, and to prepare for submission of a full CTSA application. In FY 2007, the UA Vice President for Research joined the Dean of the College of Medicine in a successful request for TRIF funds to support a UA ACTREC office. The role and purpose of this office was to serve as a central coordinating point for all UA activities necessary to facilitate and consolidate clinical and translational science at the UA, as well as for collaboration with ACTREC partners statewide.

UA ACTREC Functions: TRIF funds administered through the ACTREC office have supported two key functions at UA:

- i. **The Clinical and Translational Science (CaTS) Clinical Research Unit (CRU).**
- ii. **The Clinical Scholars Program.**

1.3. TRIF INNOVATION FUND SUPPORT FOR ASU AND NAU CTSA ACTIVITIES

ACTREC also provided invaluable infrastructure support to facilitate formation of the statewide Health Research Alliance Arizona (HRAA) consortium of investigators from UA, ASU, and NAU that was formed in the summer of 2007 to prepare an Arizona CTSA application. HRAA submitted a full CTSA application to NIH in November 2007, for which Keith Joiner, M.D., Dean of the UA College of Medicine, was the Principal Investigator (PI). The application was not funded.

TRIF ACTREC support was awarded specifically to the UA. Because of the statewide Arizona CTSA mission, with major involvement of ASU and NAU, in November 2007 President Shelton coordinated the successful application for additional TRIF support from Regents Innovation Funds. TRIF Regents Innovation Funds have supported three **non-UA HRAA/CTSA activities**:

- i. **The Arizona Insulin Resistance (AIR) Registry**, led by Lawrence Mandarino, PhD, Professor and Director of the Center for Metabolic Biology at ASU.
- ii. **The Multi-Site Investigator Portal for Biomedical Collaboration (MSIPBC)**, led by Robert Greenes, M.D., Professor, at ASU and the College of Medicine-Phoenix.
- iii. **The Tri-University CTSA Collaboration for On-Line Course and Program Development**, and Evaluation, led by Robert Trotter, PhD, Regents Professor, at NAU.

Progress reports follow for 2010 of TRIF UA ACTREC and TRIF Innovation Fund ASU and NAU HRAA/CTSA activities.

2.1. UA ACTREC 2010 PROGRESS REPORT

2.1.i. The Clinical and Translational Science (CaTS) Clinical Research Unit (CRU)

Background and Organization: TRIF funding was used in 2007 to create the CRU in 3,500 square feet of refurbished space in the Salmon Building of the Arizona Cancer Center. This space became available when the Cancer Center Clinics moved to the new 80,000 square foot Fasseas Cancer Center facility on a separate site 1.5 miles north of the Arizona Health Sciences Campus. The CaTS CRU could not have been created without TRIF support. Resources of the CaTS CRU, which opened in January 2008, include:

- 12 examination rooms, including 2 pediatric rooms separated by a one-way mirror
- An infusion/metabolic studies area that can accommodate up to 8 patients at one time
- Patient waiting and reception areas; 4 offices for administrative, nursing, and IT staff
- Videoconferencing room and 4 tablet laptops for investigator and subject use
- Conference area with desks and WiFi capability for investigators and students
- Web-based system for investigators and clinical research associates to schedule research subjects for CaTS CRU appointments

Peter Lance, MD (Professor of Medicine and Molecular and Cellular Biology; Chief Cancer Control Officer, Arizona Cancer Center) has been Medical Director of the CaTS CRU since the unit opened in January 2008. Jamie Goodwin, PhD is the Administrative Director. Fiscal and administrative responsibility for CaTS has been transferred from the College of Medicine to the CTSI/BIO5. A CRU Advisory Committee (CAC) represents the investigators who use the unit and their departments and colleges. The CAC is chaired by Karen Weihs, MD (Associate Professor of Psychiatry). The current members of the CAC are listed in Table 1. The committee fulfills essential governance roles as both a 'users group' and also an advisory group to the Medical and Administrative Directors on CRU policy and best practices.

Table 1. CRU Advisory Committee Membership (CAC)

Member	Department	College/Center
John Badal, MD	Anesthesiology	Medicine
Bruce Coull, MD	Neurology	Medicine
Melissa Faulkner, PhD		Nursing
Francisco Garcia, MD	OBGYN	Medicine
Jamie Goodwin, PhD (<i>ex officio</i>)		Respiratory Center

Member	Department	College/Center
Kurt Griffin, MD, PhD	Pediatrics	Medicine
Peter Lance, MD (<i>ex officio</i>)	Medicine	Medicine/Cancer Center
Jo McClain, RN		Liver Center
David Nix, PhD		Pharmacy
Duane Sherrill, PhD		Public Health
Jennifer Sinnard, B Pharm		UMC Pharmacy
Craig Stump, MD, PhD	Medicine	Medicine
Hugo Villar, MD	Surgery	Medicine
Karen Weihs, MD	Psychiatry	Medicine
Donna Webb, RN		Medicine Admin (Office of Deputy Dean for Research)

TRIF support for the salaries of 9 staff and operating expenses has been largely responsible for steady growth in the number of active protocols conducted in CaTS. As of August 13, 2010, a total of 39 protocols are open and accruing patients in the CaTS CRU (Table 2).

Table 2. Protocols Currently Active and Accruing in CaTS CRU

Study	Investigator	Department	College	Study Type	Visits to Date
Replagal Enzyme	L-W. Lai	Pharmacology & Toxicology	Pharmacy	Industry	86
Diabetes	C. Stump	Medicine	Medicine	NIH	86
Elan Study	G. Ahern	Neurology	Medicine	Industry	37
Globeimmune	T.D. Boyer	Liver Resch Inst	Medicine	Industry	64
E-1	T.D. Boyer	Liver Resch Inst	Medicine	Industry	72
SP5216 Naive	T.D. Boyer	Liver Resch Inst	Medicine	Industry	208
NASH	T.D. Boyer	Liver Resch Inst	Medicine	Industry	12
SP 5101 Prev Tx	T.D. Boyer	Liver Resch Inst	Medicine	Industry	55
SP5063 F-Up	T.D. Boyer	Liver Resch Inst	Medicine	Industry	22
Nabi-4514	S. Leischow	Cancer Center	Medicine	Industry	270
IDEC 102-21	B. Vaz	Arthritis Center	Medicine	Industry	31
MRA 17823	B. Vaz	Arthritis Center	Medicine	Industry	97
MRA 18696	B. Vaz	Arthritis Center	Medicine	Industry	20
Pfizer OA	B. Vaz	Arthritis Center	Medicine	Industry	66
SCRIPT	B. Vaz	Arthritis Center	Medicine	Industry	47
STAGE	B. Vaz	Arthritis Center	Medicine	Industry	28
Blys 3 EXT	J. Lisse	Arthritis Center	Medicine	Industry	0
SL0008	J. Lisse	Arthritis Center	Medicine	Industry	18
West Nile Virus	J. Nikolich-Zugich	Immunobiology	Medicine	NIH	148
Certolizumab	J. Lisse	Arthritis Center	Medicine	Industry	65
RTOG 0614	Scott Tannehill	Radiation Oncology	Medicine	NIH	6
SAMe	T.D. Boyer	Liver Resch Inst	Medicine	Industry	32
Roche-NV25025	F. Garcia	OBGYN	Medicine	Industry	13
Reslizumab Open-Label	Hassan Hassan	Pediatrics	Medicine	Industry	44
GLAD	G. Ahern	Neurology	Medicine	Industry	39
E-2	T.D. Boyer	Liver Rsch Inst	Medicine	Industry	46
Tanezumab 1016 extension	J. Lisse	Arthritis Center	Medicine	Industry	1
ROSE study	J. Lisse	Arthritis Center	Medicine	Industry	7
EC-MPS	B. Kaplan	Medicine	Medicine	Industry	0
RAD001 Everolimus Study	B. Kaplan	Medicine	Medicine	Industry	4
Protease Procrit Study	T.D. Boyer	Medicine	Medicine	Industry	88
JANSSEN Alzheimer Immunotherapy	G. Ahern	Neurology	Medicine	Industry	9
TuCASA Phase 1	S.F. Quan	Respiratory Center	Medicine	NIH	51
SHHS	S.F. Quan	Respiratory Center	Medicine	NIH	0
Resp-Sci Computer Support	F. Martinez	BIO5 Institute	Medicine	NIH	34
Osiris 403 Prochymal Infusion	M.R. Movahed	Sarver Heart Center	Medicine	Industry	2

Study	Investigator	Department	College	Study Type	Visits to Date
APPLES	S.F. Quan	Respiratory Center	Medicine	NIH	0

2.1.ii. The Clinical Scholars Program

Background: Six Clinical Scholar Awards were made in both 2007 and 2008. Awardees were young translational/clinical scientists (Instructor or Assistant Professor level) who had not received extramural funding. The program has been led jointly by Drs. Lance and Martinez since its inception. Selection of Scholar Awards in both 2007 and 2008 followed posting of a formal RFA. All applications were reviewed and scored formally by 2 experts. Awardees were selected at a meeting of an Advisory Committee, functioning as a mini ‘study section,’ at which the applications and reviews were discussed. Because of the reductions in TRIF funding, it has not been possible to fund further Scholars since 2008. However, we continue to track academic progress and productivity of Scholars funded in 2007 and 2008 (Table 3).

Table 3. Clinical Scholars – 2010 Update

Scholar	Project Title	Aims, Approach & Results	Resulting Productivity
2007			
Nathan Cherrington, PhD Associate Professor, Pharmacology & Toxicology and Hassan Hassan, MD Clinical Associate Professor, Pediatrics	Altered Drug Metabolism and Disposition in Human Non-Alcoholic Fatty Liver Disease	<ul style="list-style-type: none"> Determine plasma and urine levels of APAP & APAP metabolites (APAP-GLUC) after a single dose of APAP in pediatric patients with biopsy-proven non-alcoholic steatohepatitis (NASH) or steatosis (fatty liver) Results: Demonstrated potential to develop APAP-GLUC as a non-invasive (i.e., avoid liver biopsy in children) blood or urine test to distinguish patients with NASH (clinically serious) vs. simply steatosis (minimal clinical significance) 	<ul style="list-style-type: none"> R01 application of January 2010 received impact factor score of 20 (5th percentile), with funding virtually certain (final decision at Council meeting scheduled for October 2010)
Susan Hoover MD, PhD Assistant Professor, Clinical Medicine	Promotion of Best Practices for Valley Fever in Arizona through Development of Registries	<ul style="list-style-type: none"> AZ Health Query database used to analyze 3 million AHCCCS patient for relationship between valley fever and community-acquired pneumonia; and to establish an AZ valley fever database Results: Only 4% of AHCCCS patients with pneumonia had been tested for valley fever. Approx. 35% of “valley fever” diagnoses were NOT associated with a diagnostic test (serology or culture). Persons with confirmed (serology or culture) valley fever tended to be younger & more likely to be male than all persons with pneumonia. Valley fever is an important and under-recognized cause of pneumonia in AZ. 	<ul style="list-style-type: none"> No publications or grant applications reported
Karen Weihs, MD	Development and Testing of	<ul style="list-style-type: none"> Immunohistochemistry of oxytocin receptor (OTR) density 	<ul style="list-style-type: none"> 1 abstract Funded R01,

Scholar	Project Title	Aims, Approach & Results	Resulting Productivity
Associate Professor, Psychiatry and Family & Community Medicine	Immunohistochemical Staining for Oxytocin Receptors: Extending Translational Research Skills	<ul style="list-style-type: none"> in human surgical breast cancer tissue and SCID mouse xenograft tumors; investigate intracellular localization of OTRs Results: Nuclear OTR density greater in normal human breast tissue than in breast ductal carcinoma cells 	effective 9/4/2009: Emotion Regulation and Depression in Breast Cancer Survivorship
Samuel Keim, MD Professor, Emergency Medicine	Relationship between Immigrant Heat-Related Deaths and Predicted Weather Patterns	<ul style="list-style-type: none"> Investigation of heat death cases at Pima County Forensic Science Center Results: Model developed that will allow Arizona-Mexico border officials to better predict risk of heat death, and apply resources towards prevention, search and rescue accordingly 	<ul style="list-style-type: none"> 1 abstract
Donna Wolk, PhD Assistant Professor, Chief, Clinical & Molecular Microbiology; Department of Pathology	GeneXpert [®] SA/MRSA Assay – Alpha and Beta and Clinical Research Study Protocol	<ul style="list-style-type: none"> Develop clinical protocols for use of a rapid molecular assay to detect methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) from nasal and wound swabs, and blood cultures. Studies were conducted in hospitalized & non-hospitalized patients and healthcare workers. The Cepheid GeneXpert SA/MRSA assay was evaluated according to FDA requirements Results: The Cepheid assay was fast and accurate, allowing for rapid identification of bacterial carriers of deadly hospital-acquired infections. Worldwide implementation of this technology has demonstrated its effectiveness. Locally, the decrease in MRSA infections has been as high as 87%. This study has led to reduction in time to diagnosis from 2-3 days to 45-72 min. 	<ul style="list-style-type: none"> 4 peer-reviewed publications with Dr. Wolk as first or last author 2 review articles, which was in top 10 for Elsevier downloaded reviews in 2009 Currently funded as PI of a sub-award to a NIH U54 grant 7 current industry awards PI of NIH R01 that is currently under review
2008			
Clara Curiel, MD Assistant Professor, Medicine	The Role of VEGF, p-AKT, PTEN, and HIF-1 α Expression as Potential Biomarkers for Melanoma Progression in Atypical Melanocytic Lesions	<ul style="list-style-type: none"> To determine levels of these biomarkers and evaluate reverse phase protein microarray network mapping in melanocytic lesions, including malignant melanomas Results: VEGF-A expression is a novel potential biomarker in progression from benign melanocytic lesions to malignant melanoma 	<ul style="list-style-type: none"> 1 peer-reviewed publication Funded NCI/DCP Phase IIa Trial of sulindac in patients at increased risk for melanoma, using the biomarker identified in Clinical Scholar project
Betsy Dokken, NP, PhD Assistant Professor, Medicine	The Effects of GLP-1 Postconditioning after Sudden Cardiac Arrest	<ul style="list-style-type: none"> Determine effects of glucagon-like peptide (GLP) 1 in swine after cardiac arrest & resuscitation Results: GLP-1 \rightarrow significant 	<ul style="list-style-type: none"> 1 published abstract and 1 paper in press American Heart Association (AHA)

Scholar	Project Title	Aims, Approach & Results	Resulting Productivity
		improvement in post-resuscitation coronary microvasculature; non-significant trend towards improved survival	<ul style="list-style-type: none"> Young Investigator Award Funded SWEHSC Pilot Project Award Submitted AHA Beginning Grant-in-Aid Award Submitted NIH/NHLBI K08 (mentored clinical scientist) application
Leona Downey, MD Assistant Professor, Clinical Medicine	A Pilot Study of Estradiol Followed by Exemestane for Post-Menopausal Hormone Receptor Positive Metastatic Breast Cancer after Prior Failed Endocrine Therapy: Reversing Endocrine Resistance	<ul style="list-style-type: none"> Investigator-initiated feasibility/toxicity study in women with advanced breast cancer, using specified biomarkers Results: Much of funding period was occupied negotiating IRB concerns, & approval now obtained 	<ul style="list-style-type: none"> Pfizer has agreed to fund the study through the Southwestern Oncology Cooperative Group (SWOG)
Kurt Griffin, MD, PhD Assistant Professor, Pediatrics	Population Proteomics to Predict Autoimmune Diabetes: Applying New Methodologies to Legacy Samples	<ul style="list-style-type: none"> Use of data mining techniques for population proteomics in samples from the TrialNet Type 1 diabetes (T1D) natural history study to identify biomarkers of increased risk for T1D Results: Work in progress 	<ul style="list-style-type: none"> Preparation of NIH SBIR grant to continue the project in progress
Jaswinder Ghuman, MD Associate Professor, Psychiatry and Pediatrics	Feasibility and Utility of Autonomic Correlates of Impulsivity in Preschool Children with Attention Deficit Hyperactivity Disorder (ADHD)	<ul style="list-style-type: none"> Assessment of electrodermal activity as a biomarker of response inhibition in children with ADHD and controls Results: Feasibility of the approach was demonstrated in 4 healthy pre-school controls and 1 pre-school child with ADHD 	<ul style="list-style-type: none"> 1 abstract Submitted Institute for Mental Health Research (Phoenix, AZ) application
Eric Snyder, PhD Assistant Professor, Pharmacy	Modifying Genes in Cystic Fibrosis (CF): the β -2 Adrenergic Receptors and Epithelial Na^+ Channels	<ul style="list-style-type: none"> Determine effects of variation in specific genes on response to β-agonist in 50 patients with CF & 50 controls Results: β-agonist \rightarrow improvement in alveolar-capillary membrane conductance & O_2 saturation in CF patients 	<ul style="list-style-type: none"> 9 abstracts: 6 accepted and 3 submitted 2 papers submitted

2.2. TRIF INNOVATION FUND CTSA ACTIVITIES AT ASU AND NAU – 2010 PROGRESS REPORT

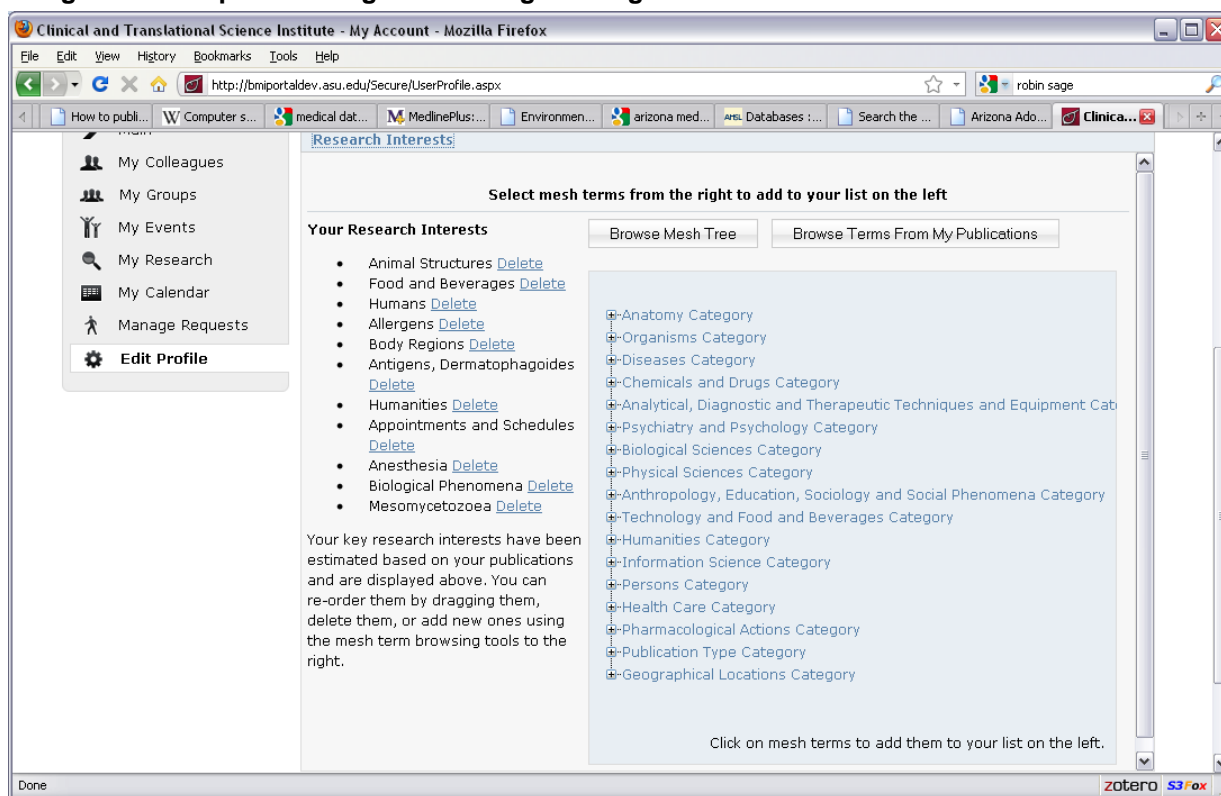
i. **The Arizona Insulin Resistance (AIR) Registry** is led by Lawrence Mandarino, PhD, Professor and Director of the Center for Metabolic Biology at ASU. The AIR Registry was conceived as a ‘virtual’ CRU for enrolling Hispanic volunteers, primarily of Mexican descent, at risk for type 2 diabetes mellitus (T2D). 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. RNA is isolated from white blood cells to assess inflammatory status. Volunteers are asked to give consent to be contacted for their

possible participation in future studies, including randomized controlled intervention trials. Since its inception, the AIR Registry has been successfully enrolling individuals at a rate of approximately 30 per month. AIR Registry subjects can be characterized as having an abundance of Metabolic Syndrome risk factors and are, therefore, at increased risk for T2D and cardiovascular disease, as was intended.

To date, approximately 550 people have entered the AIR Registry, of whom almost 95% have consented to be contacted for future research studies and have agreed to banking of their DNA and other samples. With the past year's TRIF support, overall enrollment now exceeds the targets that were set. Importantly, through their enrollment in the registry, about 75 previously undiagnosed individuals have been found to have T2D and have started treatment for this condition.

ii. **The Multi-Site Investigator Portal for Biomedical Collaboration (MSIPBC)** is led by Robert Greenes, M.D., Professor, at ASU and the College of Medicine-Phoenix. This project is being conducted to develop a capability that is essential to multi-party, multi-site collaboration in

Figure 1. Sample Web Page Illustrating Investigator Profile



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 needed for those collaborations. In addition, the portal enables (4) rating and evaluation of 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. We also have developed an approach that is easily extensible and

adheres to evolving standards and software architectures that facilitate modularity and distributed functionality to enhance its robustness.

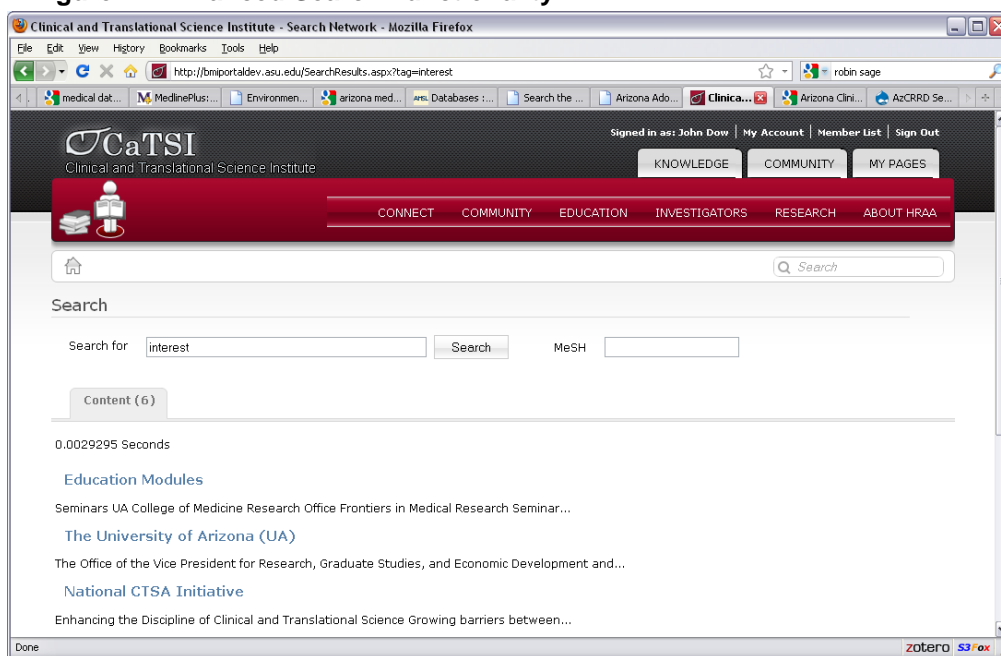
PROGRESS

A new CTSA application from the UA CTSI is in advanced stages of preparation for an October 2010 submission. Dr. Greenes will lead the Biomedical Informatics Key Function of this proposal in a major ASU subcontract. TRIF support in the past year has enabled the accomplishment of major groundwork towards the CTSI informatics platform that is a *sine qua non* of a successful CTSA application. The former HRAA/CTSA website has not been accessible during this period of reconstruction, and there have, therefore, been no hits to the website during this period. Hits to the reconstructed website will be included in the report for the next fiscal year. Following is an account of the website reconstruction that has taken place in the past year.

Developed User Profile Editing Section. Registered site users can use a publication wizard to select publications from Pubmed and associate that information with their profiles. Publication information is then culled to create a list of mesh terms that a site user can associate with his/her profile. Site users may also browse a mesh tree to assign and prioritize their key research interests (Figure 1).

Completed Researcher Profile Display. Based on publications associated with a site user, various sets of data about that individual are made available to all site visitors. These include a public “Research Profile” section that shows the relative frequency of work in different categories of research (based on mesh terms), a “Publications” section showing publication

Figure 2. Enhanced Search Functionality



abstracts, a “Co-authors” section showing all co-authors with links to their own research profiles, a “NetworkView” showing a visual representation of research collaborations, and a “GeoNetworkView” showing the location of publications for a given author.

Enhanced Search Functionality (Figure 2). Searches bring back search results in tabbed interface that classifies results by different types such as web page content, researcher profiles, groups, and calendar events. Searches can be made against any content in the portal by either

free text keyword searches or mesh terms (content that has been tagged specifically with a mesh term).

Researcher Video Conferencing Collaboration Tool. A browser-based video conferencing tool for groups is in at an advanced stage of testing and development currently. It allows members of a research team to smoothly jump into large audio/video conferences without the need to install specialized software. It does not require third-party software or license fees to use, and the source code can be opened up to a larger community of potential users.

Collaboration Workspace. We are currently evaluating open source tools that would allow for shared directories of documents for groups, in essence creating virtual shared file networks enabled by the portal. Meta-information about the documents will enhance research proposal construction in particular. Advanced and simple versions of document sharing are under evaluation.

Re-skin of website. The design of the website has been updated to match the graphical template created last year. This has enhanced the navigation and usability of all features of the research portal.

Third-Party Software Services. As part of the vision for providing a hub of researcher resources, REDCap has been installed and is being used by Phoenix Children's Hospital. This is just one of the resources that will be available from the portal's resource area as that area becomes more complete.

Registry Development. Current work being conducted will allow for resource providers to add resources such as consultants, databases, equipment, and software tools. Each of these resources has unique fields of data that are currently being assessed. Data planning for storage of these unique data types is substantially documented.

Future Enhancements. In fulfilling the vision of the semantic web, information about content in the portal, particularly that about researchers, will be shared (as a default, although private workgroup data can be kept private) in RDF format to RDF-capable software agents and search engines. We will be utilizing shared ontologies that numerous other universities are building on, likely incorporating the work of the VIVO consortium. Registry development is also a key priority, expanding this from data planning to implementation in software. If we use the VIVO approach, then RDF description of resource attributes will be applied to registry data. Future third-party software provided will likely include i2b2. Lastly, tools for collaboration support, such as document sharing and audio/video tools, will also be upgraded.

iii. The Tri-University CTSA Collaboration for On-Line Course and Program Development, and Evaluation is led by Robert Trotter, PhD, Regents Professor, at NAU. The NAU HRAA (now CTSI) program has successfully completed its fourth year of funding (of a five year program). The HRAA/CTSI was charged (in FY10) to 1) take the coordination and course development lead in on-line CTSA core course and educational program development for the three universities (UA, ASU, NAU) in order to realize the HRAA/CTSI's educational goals (required for the national CTSA funding); 2) To help establish, evaluate, and promote community outreach relevant to establishing and evaluating CTSA functions in Northern Arizona; and 3) to create and begin to pilot an innovative evaluation model for the next submission of the CTSI grant.

NAU Office Structure. The NAU office staff consists of the NAU HRAA/CTSI Director (Robert T. Trotter, II Ph.D.), the NAU HRAA/CTSI project coordinator (Kelly Ann Harris, MA) and several graduate assistants.

Progress Report. The NAU CTSI successfully completed a majority of the fiscal year 2010 objectives. Structural, financial, and administrative changes within the CTSI (formerly HRAA) required a change in the CTSI Primary Investigator/Director, and new administration for the Tri-University HRAA/CTSI at the BIO5 Institute. These changes affected the start and finish timelines for several of the fiscal year 2010 objectives. The new leadership and structure of the CTSI produced very positive changes in the NAU CTSI/HRAA program, strengthening the CTSI goals and program. One result of the administrative changes is that funding was necessarily delayed on some parts of the FY10 scope of work, and as a consequence, those projects are being completed through a no-cost extension (through December 2010). The current accomplishments will allow a successful completion of the FY11 scope of work for this program.

Education Scope of Work Fiscal Year 2010. The CTSI (formerly HRAA) curriculum was significantly advanced during fiscal year 2010. Half of the certificate courses were developed on-line and are ready to be taught when the new program is launched in the fall of 2011. NAU successfully piloted one of the certificate courses during the spring 2010 semester. The new graduate certificate program in Clinical and Translational Science received the final approval by the University Graduate Curriculum Committee in October 2009. The certificate program proposal will be reviewed by the appropriate committees at ASU and UA by the fall 2010. A model for collaborative graduate programs (across academic institutions) based on the tri-university certificate program was presented at the Society for Applied Anthropology (SFAA) meetings in Merida, Mexico (Harris: *The Trials and Tribulations of Institutional Collaboration: Creating a New Tri-university Graduate Program*; March, 2010). The NAU CTSI assisted with grant writing for the Research, Education, Training, and Career Development key function for the 2010 CTSA application providing information related to the graduate certificate program and the pipeline program.

Community Collaboration/Partnerships, Scope of Work Fiscal Year 2010. All objectives related to community collaboration as outlined in the fiscal year 2010 scope of work have been completed by the NAU CTSI. This includes the completion of a Community Health Status Assessment for the Navajo County Health Services District, as part of the Mobilizing for Action through Planning and Partnerships (MAPP) process. Finally, NAU CTSI conducted evaluation-based outreach for the Partnership for Native American Cancer Prevention. The NAU CTSI conducted a pilot collaboration with the Navajo County Health Department to provide evaluation services for the MAPP program, utilizing NAU personnel from the CTSI project and from the Interdisciplinary Health Policy Institute.

Evaluation, Scope of Work Fiscal Year 2010. Most of the design elements of the CTSI evaluation model have been developed and tested through NAU CTSI/HRAA office collaboration on a National Cancer Institute (NCI) funded grant, the Partnership for Native American Cancer Prevention (NACP). This pilot allows the CTSI to test evaluation strategies and develop effective data collection processes and data base development and management. Overall, the NAU CTSI office accomplished a majority of the objectives identified for the 2010 fiscal year, with the final progress on delayed aspects to be accomplished by December 31, 2010, utilizing a no-cost extension of this year's funding. All final year accomplishments for FY11 are scheduled and will be accomplished within the fiscal year.

To reiterate, the UA TRIF-supported ACTREC was established to provide the infrastructure for a statewide CTSA application. Additional TRIF Regents Innovation Fund support was obtained to provide complementary infrastructure at ASU and NAU.

3. CTSA APPLICATION – CURRENT STATUS

A second, again unsuccessful CTSA application was submitted in October 2008 under the leadership of Keith Joiner, MD. Dr. Joiner stepped down as PI in May 2009, and Fernando Martinez, MD, Director of BIO5 and the Arizona Respiratory Center, assumed leadership of a new Clinical and Translational Science Institute (CTSI). A new UA CTSA application with Dr. Martinez as PI will be submitted under the auspices of the CTSI in October 2010. Thus, the CTSI has replaced HRAA as the UA organizational entity from which the CTSA will emanate.

PERFORMANCE MEASURES HRAA TRIF REGENTS INNOVATION FUNDS - FY 2010

	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY10 Actual	FY11 Proj
RETURN ON INVESTMENT							
Sponsored Awards (\$ in millions)					\$5	\$5	\$10
Grants Received					4	22	9
Grants proposals submitted to funding agencies	1	1	8	3	5	41	32
PARTNERSHIPS AND COLLABORATION							
Research Projects Started	1	1	6	4	6	10	8
New Collaborations Between HRAA Members (Universities, Research Institutions, Hospitals, Health Plans, Healthcare Providers)	30	40	60	50	80	30	100
New Industry-University Collaborations Developed			6	1	3	4	8
New University-Government Collaborations Developed	2	2	3	2	3	4	6
Web Portal Hits and Links	12000	15000	10000	30000	75000	0	100000
CURRICULUM INNOVATIONS							
Courses Developed	6	6	8	7	8	20	8
Education Programs Approved			2	2	2	3	2
Dollars generated by curriculum (\$ in thousands)					\$20	\$3	\$20

	FY08 Actual	FY09 Actual	FY10 Revised Budget	FY10 Actual	FY11 Revised Budget	FY12 Revised Budget
REVENUE						
Carry forward	\$0	\$489,774	\$371,771	\$371,771	\$250,200	\$0
New TRIF Revenue	\$500,000	\$500,000	\$500,000	\$500,000	\$325,000	\$325,000
TOTAL REVENUE	\$500,000	\$989,774	\$871,771	\$871,771	\$575,200	\$325,000
EXPENDITURES						
ASU Subcontract - Biomedical Informatics	\$0	\$186,202	\$263,798	\$234,765	\$179,033	\$150,000
ASU Subcontract - AIR Registry	\$0	\$304,462	\$220,538	\$193,251	\$27,287	\$0
NAU Subcontract - HRAA Office/Course Dev.	\$10,226	\$127,339	\$387,435	\$193,555	\$368,880	\$175,000
TOTAL EXPENDITURES	\$10,226	\$618,003	\$871,771	\$621,572	\$575,200	\$325,000

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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 FY 2010 Annual Report

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 sustainable 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 and a robust electronic delivery system that enables the Center 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. Significant progress has been made in all project areas.

The three major initiatives and the milestones achieved in FY 2010 are:

I. The Beat the Odds Institute –

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.

- 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.
- Eighty-four K-12 schools in Maricopa County, metro Tucson and Whiteriver partnered with the Beat the Odds Institute in FY 2010 for their principals to receive mentoring, training, and networking opportunities through the School Partners Program. Additional schools in Maricopa, Pima, Graham and Yuma counties are expected to join the program in FY 2011. An ancillary program—Parents as Partners—provided training for parent liaisons who work in partner schools to help parents contribute to the academic success of their children.
- Program results have been impressive with more than half the partners improving their state rankings and 74% achieving adequate yearly progress. A recent evaluation by WestEd found that scores in reading and math on state tests were higher in BTO schools compared to similar schools not in the program.
- 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 stake holders in improving student achievement. The Beat the Odds electronic assessment tool allows principals to analyze their own performance, develop action plans for their school and leverage this information to build teacher capacity for meeting the instructional needs of individual students. A companion website provides information and support for parent liaisons. The websites will figure even more prominently in the future as we develop online training modules and expansion models to take Beat the Odds into schools throughout the state and the nation.

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.

II. Pathways to Postsecondary Success –

With the goal of establishing seamless education pathways that lead students into and through postsecondary education prepared for each step along the way, the Center is engaged in two key endeavors: the Tough Choices or Tough Times initiative and the related Move On When Ready effort; and the College and Career Pathways initiative.

- **Tough Choices or Tough Times:** The Center, in collaboration with local and national partners, brought visibility to and moved forward the key elements of the Tough Choices initiative, a robust reform agenda that addresses the entire education continuum – preschool through college. Over the course of the year, the Center established the leadership team for the Arizona Tough Choices initiative; conceptualized and developed the strategy for advancing the effort; and built broad, statewide support. The Center also worked closely with the National Center on Education and the Economy (NCEE), the organization leading Tough Choices nationally, and along with Arizona education leaders, actively participated in a national summit led by NCEE on high-quality early childhood education for the purpose of improving state policy and coordination in this area.
- **Move On When Ready:** The Center played a major role in bringing the “Move On When Ready” concept to Arizona, a key feature of the Tough Choices initiative designed to raise academic achievement for all children to national and international standards and prepare them to a college-ready level.

1. A key accomplishment this past year was the passage of the Move On When Ready legislation (HB2731), signed into law in May 2010. Through this legislation, students can earn a performance-based high school diploma, the Grand Canyon Diploma, and access multiple high-value postsecondary options as soon as they demonstrate readiness for college through participation in board examination systems. The Move On When Ready concept was included in Arizona's Race to the Top applications and in Arizona's College and Career Ready Policy Institute (CCRPI) report.
2. Over the last year the Center has actively reached out to schools across the state regarding Move On When Ready, and many schools have directly expressed interest to the Center in serving as early adopters of the model. Next steps include taking a significant role in the development and implementation of Move On When Ready in the state, working closely with the NCEE State Consortium on Board Examination Systems, the Arizona State Board of Education, the Arizona Department of Education, board examination providers, and Arizona schools, community colleges, and universities.
3. Given the scope of Move On When Ready, social media and other web tools are essential in the Center's ability to effectively communicate the project. This technology infrastructure makes it possible to readily provide information and updates. It also provides an important vehicle for individuals and organizations to join in the Move On When Ready initiative.

Central to the Tough Choices initiative, Move On When Ready is the piece that will drive all other key aspects of the agenda forward, including the focus on quality teachers and the development of a strong education pipeline beginning with high-quality early childhood education.

- **College and Career Pathways:** Through this initiative, the Center is collaborating with K-12, community college and university sector partners to develop multiple high-value college and career pathways connecting student choices in high school coursework directly to coursework in community colleges and universities. Key partners include Arizona State University, Maricopa Community College District, Phoenix Union High School District, Lake Havasu Unified School District, Mohave Community College, and the Paradise Valley Unified School District. The pathways are designed to be equally rigorous, strengthen transitional points for students along the full educational continuum, lead into career clusters, and serve as guideposts for students in order to help them successfully navigate the educational system. To our knowledge there is little precedent for pathways designs linking all three institutional levels.

Simple in concept, but challenging to do in practice, creating seamless pathways among K-12 schools, community colleges and universities requires intensive discussions and time commitments among all parties.

1. While the college and career pathways developed through this process will initially be implemented within the partner education institution sites, the larger goal is to demonstrate the success of this particular pathways approach and to document the development and implementation process in a way that can be replicated across the state.
2. Success for this project is tied to the kind of broad-based, widespread dialogue and involvement made possible through the electronic networks supported by TRIF funding.

III. The Arizona We Want

When conversations first began about The Arizona We Want, the Center set an ambitious goal—build a citizens' agenda for Arizona's second century—a vision and set of goals that will mobilize people throughout the state and survive transitions in leadership over time. Over the past year, the Center has moved forward significantly on this long-term goal by maximizing the value of its growing electronic capacity with several major statewide projects.

- Gallup Arizona Poll:** In October 2009, the Center released the results of the Gallup Arizona Poll and launched www.TheArizonaWeWant.org. The report identified eight goals and five issues that make up Arizona's Citizens' Agenda and provide Arizona's leadership and community organizations with a framework for action. The Center has established The Arizona We Want Institute to lead the implementation process and "quarterback" community and public policy initiatives that evolve from the findings of the report. Moving quickly, the Institute began establishing strategic alliances with key Arizona leadership and community organizations and identifying metrics and creating scorecards to measure progress towards each of the eight goals. By the close of FY2010, organized efforts were underway to create scorecards and action plans for 4 of the goals and issues—job creation, education, natural environment and water management, leadership and governance structures for the 21st Century—with preliminary work begun to develop strategic alliances for an additional 4 goals and issues. It is our intention, ultimately, to create similar alliances for all 13 goals and issues.

Citizens' Agenda for Arizona's Second Century

Caring for the Economy

1. Create quality jobs for all Arizonans.
2. Prepare Arizonans of all ages for careers in the 21st century workforce.

Caring for People

3. Make Arizona "the place to be" for talented young people.
4. Provide health insurance for all, with payment assistance for those who need it.

Caring for Communities

5. Protect Arizona's natural environment, water supplies and open spaces.
6. Build a modern, effective transportation system and infrastructure.
7. Empower citizens and increase civic involvement.
8. Foster citizen well-being and sense of connection to one another.

Five Issues Needing Resolution

1. Fully prepared leadership and governance structures appropriate to the 21st Century.
2. An investment strategy for resources to achieve AZ goals.
3. A clear and sustained commitment to global competitiveness.
4. A constructive solution to illegal immigration.
5. A balanced and stable tax system.

For a combination of reasons—specific citizen goals, a weak state economy, frustration with elected leaders—public interest in *The Arizona We Want* remains high.

1. More than 60 presentations to Arizona organizations have been given around the state during this past year by Dr. Lattie Coor, helping drive both citizens and leaders to the new website.
2. To date, nearly 8,000 citizens have taken the Gallup poll online and were able to immediately check their responses to questions against the responses of their fellow citizens who participated in the original poll.

3. In addition, more than 80 special participation codes have been provided to organizations that want their members, employees, boards, etc. to take the Gallup poll online as a group, and to compare their collective responses with those of Arizona as a whole.
4. The group report process has been automated and nearly 30 reports have been provided to participating organizations.

Given the statewide response to the Gallup Arizona Poll and *The Arizona We Want* report, we next asked ourselves how the Center could incorporate the goals and issues identified by citizens into the 2010 election, and we concluded that we needed to give Arizona citizens the opportunity to frame their own questions for candidates.

1. To that end, Dr. Coor asked leaders in five different communities around the state to host town meetings that would bring together citizens who were representative of their areas. The participating communities were Flagstaff, Peoria, Mesa, Tucson and Sierra Vista.
2. We also invited residents statewide to contribute their questions online. This new capability was promoted directly throughout the website, in meetings with various leadership organizations throughout Arizona, and through ongoing coverage by *The Arizona Republic* and other traditional media.

- **The Arizona We Want: Citizen Questions for Candidates:** The result of these efforts is a second statewide report, delivered electronically in July to more than 350 candidates for office in election 2010, media contacts statewide and approximately 1,600 leaders and leadership organizations affiliated with the Center in a variety of ways. The report offers an array of questions that reflect the citizen perspective on seven issues that confront Arizona voters in 2010--job creation, education, natural resources and the environment, healthcare, immigration, leadership and state government, and state finances.
 1. These citizen questions will be disseminated through personal letters from Dr. Coor inviting candidates to visit the website, download the report, and post their responses to a set of key citizen questions, and through statewide airings of the five town meetings that were taped in their entirety, as well as ongoing campaign coverage by Arizona NPR and PBS stations. The taped meetings are also available to citizens at www.TheArizonaWeWant.org.
 2. Next steps in the effort to embed The Arizona We Want into candidate campaigns in 2010 include posting key issue clips from the town meetings on the website, as well as one-on-one interviews Dr. Coor will conduct with candidates for the top state offices to talk substantively about these citizen questions. These will be taped and aired by PBS Arizona prior to the general election. In addition, the Center will work closely with a social media consultant to further connect citizens, especially younger citizens age 18-34, to key issues in innovative ways that rely on web technology.

Given the partisanship and divisiveness that has become endemic at all levels of government today, there is no way to achieve the citizen goals described by both the Gallup Arizona Poll and the new "Citizen Questions for Candidates" report without fully informed citizens who are eager and willing to express their questions and opinions to candidates by voting, attending public meetings, volunteering, and joining public discussions broadly and on specific issues using all available traditional and nontraditional communications media.

The most effective way for the Center to continue exploring the interface of issues, citizen opinion and the public accountability of leaders is via highly sophisticated communications technology. The ABOR grant has made it possible for us to take large steps within a short period of time.

In sum, 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 citizens' agenda for Arizona.

Website Usage 2009-2010

In 2009 our websites averaged 29,000 hits per month. In 2010 with the addition of the Arizona We Want website, average hits per month increased to 294,000.

Taken together these efforts are creating 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

Fiscal year ending June 30, 2010

	FY 2010 Budget	FY 2010 Actual	FY 2011 Budget	FY 2012* Budget
REVENUE				
TRIF Revenue	\$225,000	\$225,000	\$225,000	\$225,000
TOTAL REVENUE	\$225,000	\$225,000	\$225,000	\$225,000
OPERATING BUDGET				
Personal Services	\$150,000	\$112,750	\$112,000	\$112,000
Outside Vendors	\$72,000	\$111,200	\$110,000	\$110,000
Equipment/Fees	\$3,000	\$1,050	\$3,000	\$3,000
TOTAL EXPENDITURES	\$225,000	\$225,000	\$225,000	\$225,000

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

Results for Arizona

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.

Central 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 moving forward a compelling agenda for Arizona.

Together, we believe these three major projects of the Center are enabling 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 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

CFA Board of Directors

Lattie F. Coor, Ph.D.

Chairman and CEO, Center for the Future of Arizona

José Cárdenas

*Senior Vice President and General Counsel,
Arizona State University*

George Dean

President and CEO of the Greater Phoenix Urban League

Paul J. Luna

President and CEO of Helios Foundation

Ruth McGregor

Former Arizona Supreme Court Chief Justice

Bill Post

*Former Chairman and Chief Executive Officer
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Learn More

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<http://www.BeatTheOddsInstitute.org/parents>

<http://www.TheArizonaWeWant.org>

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 was made available from the Emerging Issues line item in the FY 2010 TRIF Regents Innovation Fund budget. The ABOR system office did not receive the invoice for the 2009 test instruments until July 2009; therefore, payment was made in FY 2010.

NATIONAL STUDENT CLEARINGHOUSE DATA EXCHANGE

Arizona has very limited information on the educational and enrollment patterns and ultimate success of its citizens. Good information is a requirement for data-driven decisions by education leaders, policy makers, and others, especially as Arizona strives to increase the percent of its population with post-secondary credentials. Until Arizona develops a statewide longitudinal data system, the agreement with the National Student Clearinghouse described here will provide much needed information that is not otherwise available.

In January 2010, the Arizona Board of Regents signed an agreement with the Arizona Department of Education and the National Student Clearinghouse to purchase statewide information on the postsecondary education outcomes of Arizona high school graduates for the period 2004-05 through 2008-09. FY 2010 TRIF Regents Innovation Funds in the amount of \$41,649 supported this purchase. Using records of Arizona high school graduates matched to postsecondary enrollment and graduation records, Arizona would have comprehensive information on continuing enrollment and educational outcomes for over 250,000 Arizona high school graduates.

The College Enrollment Reports include:

- Nationwide college enrollment and graduation totals for all high school graduates that can be aggregated to individual high school, district, and statewide totals.
- Summaries that can be produced by high school of the initial college choices after graduation, current college enrollment, and college graduation.
- All types of postsecondary institutions, including in-state, out-of-state, two-year, four-year, public, private, trade, and vocational schools.

The student unit level data will be combined with records maintained by the Arizona Department of Education, Arizona's community colleges, and Arizona's universities to more completely understand the academic preparation, progress, and completion of postsecondary education.

What is the benefit to the K-12 system?

Currently, Arizona's universities and community colleges produce annual reports of how well high school graduates perform in postsecondary education in the year following graduation. These reports do not include information after the

first year in higher education; information on students who pursue higher education out-of-state; information on subsequent graduation/dropout; or information on students who have a break in attendance when moving from high school to college. The National Student Clearinghouse data fill those gaps and provide individual student level data to the Arizona Department of Education and the high schools to more fully understand students' academic progress and completion.

What is the benefit to Arizona's postsecondary education system?

Many of the same benefits that accrue to the K-12 system will accrue to the universities and community colleges. Within the state, the transfer of students between public community colleges and public universities is tracked through the Arizona State System for Information on Student Transfer (ASSIST). But no information is available on the transfer and graduation of students to private postsecondary institutions in Arizona or any institutions outside Arizona without information from the National Student Clearinghouse. Data on students who continue their education and earn a certificate or diploma from these schools is currently available only through the National Student Clearinghouse.

How will this information be used in the future?

Request and response files have been exchanged between the Arizona Department of Education and the National Student Clearinghouse. Once data issues are resolved, five full years of Arizona high school graduates will be matched with their postsecondary education progress and outcomes from the Clearinghouse. These results, and the results from future graduating classes, will be integrated into the student information systems of the Arizona Department of Education, Arizona's community colleges, and the universities. Reports will be prepared that help schools, policy makers, and the general public better understand student educational progress.

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
REGENTS INNOVATION FUND

Operating

	<i>FY 2010 REV BUDGET</i>	<i>FY 2010 ACTUAL</i>	<i>FY 2011 BUDGET</i>
REVENUE			
Carry Forward	-	-	-
TRIF Revenue	150,000	148,140	140,000
TOTAL REVENUE	\$ 150,000	\$ 148,140	\$ 140,000
EXPENDITURES			
OPERATING BUDGET			
Personal Services	\$ 110,000	\$ 103,366	\$ 100,000
ERE	28,000	27,520	25,000
All Other Operating	12,000	14,078	15,000
Subtotal Operating Budget	150,000	144,964	140,000
GRANTS/PROJECTS:			
Subtotal Grants/Projects	-	-	-
EXPENDITURES GRAND TOTAL	\$ 150,000	\$ 144,964	\$ 140,000

The Operating budget supports implementation of Regents Innovation Fund projects, as well as administration of the system's TRIF fund, including budget preparation, accounting, and reporting functions.

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET

ARIZONA REGENTS REACH OUT (ARRO) GRANTS SUMMARY

	FY 2010 REV BUDGET	FY 2010 ACTUAL	FY 2011 BUDGET
REVENUE			
Carry Forward	\$ 339,934	\$ 339,936	\$ 101,681
TRIF Revenue	200,000	189,245	98,319 ¹
TOTAL REVENUE	\$ 539,934	\$ 529,181	\$ 200,000
EXPENDITURES			
OPERATING BUDGET			
Personal Services	\$ 80,000	\$ 51,748	\$ 4,500
ERE	25,000	21,624	2,000
All Other Operating	11,675	11,762	6,247
Subtotal Operating Budget	116,675	85,134	12,747
GRANTS/PROJECTS:			
FY 2011 Grants			60,000 ¹
FY 2010 Grants	241,689	208,964	48,964
FY 2009 Grants	86,754	49,913	78,289
FY 2008 Grants	94,816	83,490	-
Subtotal Grants/Projects	423,259	342,367	187,253
EXPENDITURES GRAND TOTAL	\$ 539,934	\$ 427,501	\$ 200,000

¹ Pursuant to ABOR Technology Oversight Committee direction in June 2009, \$60,000 of NAU AZUN funds were transferred to the ARRO Grant program in FY 2010 to support funding for the Center for the Future of Arizona's Advancing Arizona through a Web-based Initiative project. A similar transfer will be made in FY 2011.

ARIZONA REGENTS REACH OUT (ARRO)

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, 2009, and 2010. 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, 9 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

- **New Grant Awards:** Seven new ARRO grants totaling \$242,285 were awarded during FY 2008, in two funding rounds. Projects started January 1, 2008, and concluded June 30, 2009. All 2008 project accounts were reconciled and the books closed in February 2010.

For key outcomes of the 2008 ARRO projects, please see Attachment A.

- **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 to 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. 2009 ARRO Projects

For the second year, the 2009 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 began January 5, 2009. Six will end June 30, 2010, and one has been extended through December 31, 2010. Final reports will be due 30 days after the project end date.

For 2009 ARRO project details, please see Attachment B.

F. 2010 ARRO Projects

The ARRO FY 2010 budget for new project funding was 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.** Based on projected TRIF revenue for FY 2010 and the special project funding, ARRO's budget for new FY 2010 grant funding was

set at \$100,000. To maximize the impact of these limited dollars, three current promising ABOR-funded projects were invited to submit concept papers demonstrating how they would use an award of an additional \$50,000 to build on the previous ABOR-funded work and take their projects to the next level of implementation.

- Two projects were selected for ARRO funding at a total of \$97,927, divided as follows: \$80,000 ARRO budget and \$17,927 Regents' Innovation Fund Technology Budget
- Projects run from January 1, 2010-June 30, 2011.
- For project details, please see Attachment C.
- The third project, "IDEAL Improving Teacher Quality On-Line Professional Development (ASU)," was selected for funding by an external grantmaking organization, the Helios Education Foundation.

G. FY 2011

No funding is budgeted for new ARRO grant projects in FY 2011. All current FY 2009 and FY 2010 projects will have closed out by June 30, 2011. A final report presenting the results of FY 2009 and FY 2010 projects will be prepared after all projects have closed out.

ATTACHMENT A

Key Outcomes, FY 2008 ARRO / AZUN Projects January 1, 2008-June 30, 2009

Project Title	Key Outcomes Through June 2009:
<p>NAU: Curriculum Development for Distance-Learning Program: MA in English-General Studies (ARO08-01)</p> <p>Award Amount: \$33,248</p> <p>Project Summary: This project promotes the rapid development of three online classes in order to expand course offerings in the Masters in English-General Studies, a new distance-learning program at NAU. These courses – American literature, literary theory, and introduction to creative writing – will fill gaps in curricular offerings for distance students.</p>	<ul style="list-style-type: none"> • Each course has now been taught multiple times – and each time, all seats were filled by the start of the school term. • PIs report that “because of the rapid development of new courses made possible by the ARRO grant, over 160 seats in new literature and new writing courses were made available to NAU distance learning master’s students between July 2008 and July 2009.” • Since the grant was first awarded in 2008, the MA program has grown from 65 students to over 100 in May 2009. Of these, more than 70 were from outside the Flagstaff area, and 80% were community college or K-12 teachers. • Overall, the rapid deployment of the new distance courses has fueled more than 60% program growth in past year and a half.
<p>NAU: On-Line Speech Pathology Leveling Course (ARO08-02)</p> <p>Award Amount: \$35,760</p> <p>Project Summary: This project develops and offers four 3-credit speech pathology courses required by the Council for Academic Accreditation of the American Speech-Language-Hearing Association for entry into graduate-level study. Nationally, and especially in rural areas of Arizona, speech-language pathologists are in extremely short supply, partly because the minimum requirement for licensure is a master’s degree.</p>	<ul style="list-style-type: none"> • ITS support staff time constraints delayed website development to Fall 2008 term. The timeline for course delivery was changed slightly to allow the SST program to offer all courses via web or in classrooms in alternating semesters each year. • SST 202, “Phonetics”; SST 251, “Anatomy of the Speech and Hearing Mechanism”; and SST 350, “Communication Development in Children,” were developed and offered in Fall 2008. • SST 375, “Speech Science,” and SST 376, “Hearing Science,” were developed and offered in Spring 2009. • The final two courses, SST 405, “Neurological Foundations of Speech, Language and Hearing,” and SST 456, “Survey of Audiology,” were developed and offered in Summer 2009. • PI reports that “enrollment trends suggest that the leveling program will continue to self-sustain.”
<p>UA: Using Distance Learning to Extend Mathematics Outreach to Rural Teachers (ARO08-03)</p> <p>Award Amount: \$50,000</p> <p>Project Summary: This project addresses the problem of retention of middle-school mathematics teachers in rural and high-need</p>	<ul style="list-style-type: none"> • The project has met all its timeline targets to date. • Course 1 was developed and uploaded to E-College and offered in spring 2008 to a total of 9 enrolled teachers. (Target enrollment: 8-10) All teachers were from high-needs schools; one was from a rural school. • By Aug. 18, 2008, Courses 2 and 3 had both been developed and uploaded, including tentative course outline, syllabus, sample activities, and discussion threads.

Project Title	Key Outcomes Through June 2009:
<p>schools by enhancing professional development opportunities. Specifically, the project develops and uses distance-learning to deliver three mathematics courses that are foundational to the UA's masters degree for middle-school mathematics teachers.</p>	<ul style="list-style-type: none"> • Course 2 was offered in fall 2008 with 9 teachers enrolled and completing. All were from high-needs schools; one was from a rural school. • Course 3 was offered in spring 2009 with 7 teachers completing, all from high-needs schools and one from a rural school. • The team invested extensively in recruitment to rural schools. "The steep price of tuition seemed to be the primary factor" for lack of enrollment of rural teachers. • The team plans to continue recruiting teachers from rural schools.
<p>NAU: Stepping Up by 2s: Implementing and Evaluating an Upside-Down 2+2 Allied Health Professional Preparation Model (ARO08-04)</p> <p>Amount Awarded: \$39,638</p> <p>Project Summary: This project will conduct initial marketing efforts for the allied health degree completions programs recently established at NAU through a 2006 ARRO grant. Funding will also establish an evaluation plan to guide recruitment, retention, administration, and curricular activities as this much-needed professional curriculum is brought to full scale.</p>	<ul style="list-style-type: none"> • A variety of marketing and outreach initiatives were launched with the ARRO Step-Up funding. • Six new students have enrolled as a direct result of the four student receptions held in Phoenix and in Tucson. • Focus groups held in Fall 2008 and Spring 2009 provided valuable feedback regarding curriculum planning and guidance. • As of Fall 2009, as a result of the ARRO-funded marketing/outreach efforts, enrollment stands at 64 in the five new allied health programs created by the original ARRO grant (Respiratory Care, PT Assistant, Paramedic Care, Surgical Technology, and Medical Assisting). • In addition, the marketing initiative benefited the online programs that existed before the ARRO grant, with Fall 2009 enrollments of: BA Applied Science in Health Sciences, 90; BS Community Health, 74; and Diagnostic Medical Imaging and Therapy, 50.
<p>NAU: Stepping Up ANT 205: Native Peoples of North America (ARO08-05)</p> <p>Amount Awarded: \$24,000</p> <p>Project Summary: ARRO 2006 funding created ANT 205: "Native Peoples of North America" as an online curriculum, allowing this key liberal studies course to reach students throughout Northern Arizona. ARRO "Step-Up" funding would create a series of online learning activities within several of the existing ANT 205 modules – for instance, animations, simulations, audio and video – that actively engage students and enhance retention and student success.</p>	<ul style="list-style-type: none"> • The project completed the design and uploading of the previous ARRO-funded modules for ANT 205. • Development of the multimedia portion, the heart of the project, involved a series of visits to Native reservations, including Cahuilla, Yurok, Kootenai, Crow, Navajo, and Hopi, with contact with Netsilik, Chipewyan, Iroquois, Eastern Cherokee, Tlingit, Menominee, and Natchez. The result is perhaps the most comprehensive audiovisual collection of Native voices to supplement students' coursework. • Interactive features include an interactive map with Native voices emerging from clicks on specific areas; "flashcard" style pop-ups; and puzzles. • A final feature includes unique footage of village elders; for instance, PI was taken to the site of a sacred spring for one interview. • Final evaluation of student outcomes and satisfaction is still under way as of Sept. 5, 2009.

<p>UA: UA ArizonaNativeNet Introduction to Federal Indian Law: The Discovery Doctrine, Tribal Sovereignty, and the Treaty Tradition (ARO08-06)</p> <p>Amount Awarded: \$23,944</p> <p>Project Summary: ARRO 2006 funding created a series of distance-learning modules in Federal Indian Law, a resource for Native American leadership development. "Step-Up" funding will offer these modules for pilot testing to post-secondary instructors of American Indian Studies, law, and history. The series will also be pilot-tested as a self-contained Continuing Legal Education (CLE) course for bar and other legal associations throughout the country.</p>	<ul style="list-style-type: none"> • The project was extended through Aug. 31, 2009, with a final report due Sept. 30. • Under the 2008 "Step-Up" program, Phase One (modules 1-8) of the Federal Indian Law series have been completed. • The 2009 ARRO program funding supported Phase Two (modules 9-18), whose development is nearing completion as well. • Resolution of copyright and technology transfer aspects has been achieved, along with marketing the complete series. • More details on results and outcomes will be presented in the Sept. 30 final report.
<p>NAU: On-Line Science and Mathematics Teacher Certification Program (ARO08-07, AZUN-funded)</p> <p>Amount Awarded: \$35,695</p> <p>Project Summary: The ARRO 2006 project targeted career-changing individuals with degrees in science, engineering and related fields to become teacher-certified. This funding creates an infrastructure of a dedicated website, a dedicated student recruiter/retention specialist, and development of partnerships with K-12 districts to use the online program as an alternative certification internship resource.</p>	<ul style="list-style-type: none"> • This program is the approved NAU Internship Certification program for mathematics and science secondary teachers (via the MED/Certification degree program). • A key goal was to increase the number and retention rate of certified math/science teachers in Arizona. 89.4% of the 19 program completers are still teaching after 1 year – well above the reported average of 50%. • NAU has committed to continue the program, and tenure-track faculty are now teaching courses for the program, as evidence of the internal level of support.

ATTACHMENT B
FY 2009 ARRO / AZUN Projects
January 1, 2009-June 30, 2010

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 is piloting an online professional masters program that builds the skills of early- and mid-career professionals in the emerging field of sustainability. We are working 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 is developing 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 offers 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 is developing 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 being 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 funded through ARRO dollars:		\$200,000
Balance, to be paid into ARRO account from AZUN dollars:		\$16,885
PROJECTS FULLY FUNDED THROUGH AZUN and MANAGED BY NAU:		
ARO 09-05 NAU Begay	Public Health Certificate for Entry-Level Health Employees: This project is developing a fully online undergraduate certificate in Public Health and develops 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

<p>ARO 09-07</p> <p>UA Nelson</p>	<p>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.</p>	<p>\$47,989</p>
<p>TOTAL, fully-funded AZUN projects:</p>		<p>\$ 73,740</p>

ATTACHMENT C
FY 2010 ARRO / AZUN Projects
January 1, 2010-June 30, 2011

Institution	Title/Summary	Award
ARO 10-01 ASU	<p><i>Distance-Learning Format for the Tribal Financial Manager Certificate Program</i></p> <p>Original ARRO Grant: The initial ARRO-funded project, which ended Dec. 2008, developed the curriculum and overall plan for a multi-format, modular, distance-learning Certificate in Tribal Management for Native American tribal leaders and other tribal personnel.</p> <p>2010 ARRO Award: The new project builds on and expands the work completed through the initial ARRO grant by conducting a second, revised in-classroom Tribal Financial Manager Certificate program (in April 2010); videotaping the lectures and completing the necessary editing, post-production and logistical tasks to offer the unique Tribal Financial Manager professional certification program in a distance-learning format.</p> <p>The Tribal Financial Manager Certificate program is being developed in direct response to a request from the Native American Finance Officers Association and will be the first of its kind in the United States. Potential program participants are estimated to be 200 per year nationwide. Registration fees will provide sustainable, ongoing funding for the program.</p>	\$48,996
ARO 10-02 UA	<p><i>ArizonaNativeNet Native Peoples University Professional Development On-Line Education Center</i></p> <p>Original ARRO Grant: Two previous ARRO awards supported the development of 18 modules of the “Federal Indian Law for Tribal Leaders” curriculum for delivery through the ArizonaNativeNet portal, a resource for Native American leadership development. The initial award ended August 31, 2009; the second will end June 30, 2010.</p> <p>2010 ARRO Award: The new project develops and launches Arizona NativeNet’s Native Peoples University, an innovative professional-development extension to the existing ArizonaNativeNet web portal.</p> <p>With 2010 ARRO funding, AzNN is restructuring its distance-learning offerings into the Native Peoples University, with fee-based professional development curricula organized around four colleges:</p> <ul style="list-style-type: none"> • The College of Native Nations Government Structure • The College of Safe and Healthy Native Nations • The College of Native Lands and Resources • The College of Business and Economic Development <p>Revenues generated through the AzNN Native Peoples University will be reinvested initially to fund the development of additional course offerings.</p>	\$49,928
	TOTAL:	\$97,927
	Portion funded through ARRO budgeted dollars:	\$80,000
	Portion funded through Regents’ Innovation Fund – Technology	\$17,927

ABOR SYSTEM OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2010 ACTUAL / FY 2011 BUDGET
TRIF STRATEGIC INVESTMENTS (TSI) SUMMARY

	FY 2010 REV BUDGET	FY 2010 ACTUAL	FY 2011 BUDGET
REVENUE			
Carry Forward	\$ 223,759	\$ 223,759	\$ -
TRIF Revenue	-	-	-
TOTAL REVENUE	\$ 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)	195,838	195,838	-
Balance transferred to Regents Innovation Fund		27,921	
Subtotal Grants/Projects	195,838	223,759	-
EXPENDITURES GRAND TOTAL	\$ 223,759	\$ 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 carryforward amount of \$27,921 into FY 2010 that was transferred to Regents Innovation Fund in order to close out the TSI account, all TSI revenue and expenditure numbers are included in the universities' reports. The \$195,838 of FY 2009 revenue carried forward into FY 2010 was allocated to UA in FY 2010 and is reported as revenue by UA. UA also reports the expenditure. The amount is shown here for informational purposes only and is not included on the System Office Summary page to avoid double counting.

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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

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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.