

## **Technology and Research Initiative Fund FY 07 - 11**

### **Northern Arizona University**

#### **Overview**

Arizona and the United States are part of a highly competitive and highly interconnected world. As a state and a nation we face an unprecedented acceleration of global change, relentless pressure for short-term gains, and fierce competition on a global scale. We compete in the global marketplace for high value products and services, the best and brightest minds and managerial talent, and national security. However, the greatest competition is being fought in the arena of ideas, learning, and innovation.

Arizona has established a vision to be a global economic leader recognized for new discoveries, innovation, and advanced technology development. Fueled by the recommendations of recent reports (e.g., *Arizona at Risk and Arizona Partnership for a New Economy*), supported by the Technology and Research Initiative Fund (TRIF), and driven by technology-based road maps developed by Battelle, Arizona is engaged in implementing an innovation and knowledge-based state economy. Arizona has set forth an aggressive agenda to build on its core competencies, invest in knowledge-based infrastructure, and promote public, academic, and private collaboration and partnership. TRIF is a cornerstone of that agenda supporting university research and development (R&D), higher education access and workforce development, technology transfer, and academic-business partnerships.

Northern Arizona University's Technology and Research Initiative Fund (TRIF) FY 07-11 initiatives will in focus on the needs of Arizona as defined by Proposition 301 legislation and specifically identified in roadmaps developed by Battelle for the Flinn Foundation and the Arizona Department of Commerce. Northern Arizona University (NAU) has set a TRIF agenda focused on the following goals:

- ◆ Stimulate entrepreneurship, innovation, and R&D to support Arizona's knowledge-based economy.
- ◆ Increase access to higher education to prepare a skilled workforce to meet the needs of Arizona expanding economy.
- ◆ Invest in infrastructure that will promote R&D partnerships with business, enhance technology transfer, and connect knowledge creators with knowledge users.
- ◆ Develop new and expand existing programs to prepare students for high technology industries in Arizona.

These goals are based on the needs of Arizona defined by the TRIF legislation and identified in the reports and road maps cited above. During the first five

years of TRIF funding, Northern Arizona University (NAU) established four programmatic initiatives emphasizing research and development (R&D), access and workforce development, E-learning, and R&D infrastructure. In FY 07-11, NAU will continue these initiatives in an effort to build on areas of excellence at NAU and meet the economic development requirements of TRIF.

### **Organization**

The functional organization of NAU's TRIF program is shown in Figure 1. A major change in the management of the NAU TRIF for FY 07-11 is the increase in external oversight and review. External oversight and review will occur through an established Oversight Board of Arizona business leaders, with an external evaluator, and by the use of initiative and discipline-specific academic and business experts in a competitive-based project funding process. Additional oversight will be accomplished through initiative specific advisory committees that will combine NAU academic leadership (i.e., Deans) and external business leaders. The Office of the Vice Provost for Research & Graduate Studies will continue to have responsibility for programmatic and financial monitoring of all NAU TRIF initiatives.

The Oversight Board will semi-annually review the general progress of each initiative in achieving business-plan based goals and assist in setting an overall direction for NAU TRIF. The external evaluator will annually assess specific metrics to provide an external view of progress. Discipline-based experts will be used to make recommendations for funding individual projects and initiative advisory committees will establish priorities, develop business strategies, and support operations and management. This multi-tiered approach to oversight and review will provide strong assurance that NAU TRIF is succeeding in meeting the goals of the TRIF program in Arizona.

While the four initiatives (Growing Biotechnology (GBI), Environmental Research, Development, and Education for the New Economy (ERDENE), Access/Workforce Development (AWD), and E-Learning) are proposed to continue in FY07-11, significant changes are planned in each initiative to more effectively address Arizona's needs and priorities for economic development. Brief descriptions of each initiative and proposed changes are described below.

### **Research & Development (R&D)**

The two R&D-based initiatives, Growing Biotechnology (GBI) and Environmental Research, Development, and Education for the New Economy (ERDENE) will be solidly rooted in the technology platforms identified in the Battelle reports. Each initiative will focus and expand in an interdisciplinary manner NAU's research capabilities in the areas listed in Figure 1. Strategically, each initiative will draw on the strength and expertise of faculty to selectively pursue a number of R&D venues while simultaneously coupling its

research capacity with a rigorous curriculum to produce highly competitive bachelors, masters, and doctoral graduates.

The GBI will take a new and broad view of biosciences to include biotechnology and biomedicine. GBI will also expand its collaborations across the university to include the Schools of Forestry, Engineering, and Health Professions. Specifically, GBI's new goals for FY 07-11 are: (1) Increase NAU core competencies in the biosciences based on *Arizona's Bioscience Roadmap*; (2) Expand technology transfer activities with an emphasis on commercialization and industry partnerships in association with the Northern Arizona Technology & Business Incubator and Arizona Technology Enterprises; (3) Increase the number and competitiveness of graduates to meet the workforce demands of bioindustry; and (4) Work closely with the Greater Flagstaff Economic Council, the Arizona Department of Commerce, the Arizona Technology Council, and others to attract new biotechnology businesses to Arizona. In contrast to the previous five years of TRIF funding, GBI will significantly increase its emphasis on technology transfer and commercialization. GBI will achieve these goals through a series of faculty-based development, equipment, and research seed grants. NAU's new bioscience center, Strategic Alliance for Bioscience Research & Education (SABRE), will provide much of the infrastructure for the Growing Biotechnology Initiative.

ERDENE's focus in FY07-11 is based on the Sustainable Systems platform identified in the Battelle report. ERDENE seeks to extend core scientific and engineering competencies in areas such as water resources, sustainable forestry, renewable energy, and environmental mitigation (see Figure 1). A wide range of projects will be supported within these areas to: (1) Produce new environmental knowledge essential for resource management and business development; (2) Prepare a better trained workforce that will integrate environmental, economic, and community needs; and (3) Advance technology transfer and commercialization through applied research that particularly addresses needs facing rural communities in northern Arizona and other parts of the state as well. ERDENE will achieve these goals through a competitive grant process in association with the Growing Biotechnology Initiative. Past experience has demonstrated that there is much to be gained by purposefully linking bioscience and environmentally focused research activities.

### **Access and E-Technology**

Two initiatives, Access /Workforce Development (AWD) and E-Learning, address the TRIF legislation priorities – access to baccalaureate and post-baccalaureate education for time and place-bound students and preparing students for high technology industries in Arizona. These two initiatives link the development and application of E-learning as a tool for teaching, learning, and conducting business. Further, these initiatives specifically focus academic

programs in a thorough and systematic manner on the needs of learners and their prospective or existing employers.

AWD will continue to expand targeted programs in areas of greatest need for Arizona's innovation economy. These areas include: teacher education, advanced training for engineers, advanced training for nurses and other health professions, information technology training, and business leadership and management. AWD will deliver training and degree programs on the Web, through interactive television, and in person to serve time and place bound students throughout Arizona. Course offerings will be designed to meet the needs of students for their career choices while allowing them to remain in their communities. Within five years, it is estimated that 2000 new or advanced-trained workers will benefit from the AWD initiative. This will be accomplished through curriculum innovations including hybrid course delivery methods, strategic education and business partnerships, and through the established and strong linkage to the E-Learning initiative. In addition, critical capital improvements will be made in the health professions through the renovation of buildings currently housing the College of Health Professions and School of Nursing. Increasing the capacity and updating technology will allow these academic units to deliver through AWD critical degree programs to address shortages in nursing, dental hygiene, and applied health sciences.

The E-Learning Initiative is designed to cultivate the effective use of information technology to support student learning and ultimately their success in the New Economy. E-Learning will: (1) Support the development of high quality online learning resources, courses, and programs; (2) Research and assess learning, instructional design, and the use of technology to enhance student learning and access to knowledge; and (3) Increase the facility of Arizona learners with information technology tools critical to the new knowledge and innovation-based economy. An important new development will be the implementation of the E-Learning Center. The E-Learning Center is a key research and development unit that will improve curricula and increase access to higher education through the integration of Web and other information technologies into educational offerings for residential and nonresidential students alike. The E-Learning Center will increase NAU's capacity for the successful use of web courses, improve teaching and student learning through faculty training, and establish NAU as a leading institution for utilizing E-learning to enhance educational quality and access. The E-Learning Initiative will insure that all NAU graduates are prepared for the 21<sup>st</sup> Century workforce through increased access to key academic programs and a technology skill set that will prepare them for a lifetime of learning regardless of time and place constraints.

### **University Initiatives**

Today's rapidly evolving, competitive, and insecure world requires nations, states, and universities to be flexible, responsive, and innovative within a very

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short time frame. NAU seeks to be prepared for this uncertainty by setting aside funds for specific targets of opportunity that arise through time. As with all NAU TRIF initiatives, these funds will be directed to meet the goals of the TRIF legislation and State economic development priorities. The President in association with the Provost and with guidance from the NAU TRIF Oversight Board will establish the framework for the use of these funds. It is anticipated that projects or initiatives supported with these dollars will prepare NAU for the next five-year cycle of TRIF in FY 12-16.