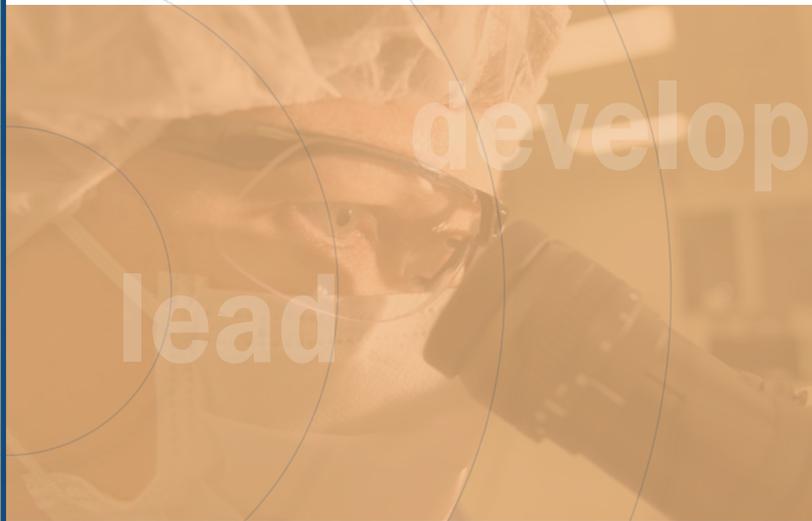


# North Dakota Centers of Excellence



educate

research



lead

develop

**Annual Report**

**2008**

# the concept:

To encourage **collaboration**  
between **public universities** and **private businesses**  
as a means of bringing **new products and services**  
to the **marketplace** which ultimately result  
in the creation of **higher paying jobs**  
for the citizens of North Dakota.

strengt

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— State of —  
**North Dakota**  
*Office of the Governor*

John Hoeven  
*Governor*



The Centers of Excellence Program is generating encouraging results from its efforts to partner North Dakota's research facilities and infrastructure with private sector companies to generate new business opportunities. To date, the state has invested just over \$25 million, which has leveraged more than \$100 million of private-sector support and had a total economic impact of \$169 million.

The Centers are exploring some of the most promising areas of business development in our state. This includes research in the fields of energy, agriculture, life sciences, electronics, aerospace and manufacturing.

North Dakota is weathering today's economic storms better than most because we have been good stewards of our state's resources, conserving but also investing wisely in initiatives that will pay dividends for our future.

We are seeing the fruits of our investments in the Centers of Excellence in a variety of ways.

- Canola research at the NDSU Center of Excellence for Agbiotechnology will help North Dakota canola growers increase revenues by up to \$66 million per year at current planting levels. This is the equivalent of 400 direct high-paying jobs.
- The National Center for Hydrogen Technology at UND has secured more than \$42 million in new sponsored research contracts to develop commercially viable applications for the production and use of hydrogen as a practical fuel.
- Marvin Windows & Doors has been able to retain their jobs and business activities in a downward, contracting industry with assistance from the NDSU Center for Surface Protection.

The core of this initiative is a belief in the power of science and technology to invent the business opportunities of tomorrow that will help the next generation of North Dakotans grow and prosper on these Northern plains.

Sincerely,

A handwritten signature in black ink that reads "John Hoeven".

John Hoeven  
Governor

## INTRODUCTION

In 2005, the Hoeven Administration proposed and the Legislative Assembly passed authority for a Centers of Excellence concept to combine education and economic development across the state at North Dakota's 11 public colleges and universities.

What follows is a report to date on North Dakota's Centers of Excellence program activities. Included is an economic impact study, performed by NDSU professor of applied economics Dr. Larry Leistritz, detailing the Centers' direct and secondary effects on the larger state economy. It provides information about private sector investments, direct job creation and when available, total payroll.

The concept behind a Center of Excellence is simple: partner our campuses with business. We invest in the infrastructure and research capacity at our state's colleges and universities and then unleash our world-class students and scientists to find ways to commercialize new ideas into products, skills and services that can create and attract new businesses and career-path jobs.

These hubs of research and technology provide a nucleus for new business growth in our state. This model is new to North Dakota, but the first Centers of Excellence program originated more than 50 years ago in California and spawned the world-famous cluster of technology research, innovation and business concentration known as the Silicon Valley.

Today, this model is being aggressively pursued across America. Centers of Excellence are engines of new economic activity in North Carolina, Texas, Connecticut, Massachusetts, Oregon, California and Minnesota. The state of Utah, a relatively small state like North Dakota, has a Centers of Excellence program. Their research universities have produced the Jarvik artificial heart and CD-ROM technology.

In establishing this program, legislators spelled out a long-term vision with a 10-year timeframe for evaluation. This report shows the results to date of the state's investment in the Centers of Excellence program.

Fourteen Centers currently exist throughout North Dakota, but three of these were started with direct appropriations from the state legislature prior to the official creation of the Centers of Excellence Program in 2005. The total state investment in the 11 Centers is \$25.4 million, which has been leveraged by approximately \$100 million in matching funds from the private sector and other sources.

North Dakota's Centers have helped attract funds to state campuses for public-sector and private-sector projects dealing with renewable fuels development, energy workforce training and technology, aerospace, electronics, advanced manufacturing and other technical research and development areas.

Investments in the Centers of Excellence to date have resulted in sixteen new or expanded businesses: five new spin-off companies, seven companies with a new presence in North Dakota and four expansions of existing North Dakota companies. Additionally, 493 direct, new jobs have been created with another 771 estimated new jobs supported through partnerships and collaborative relationships with the Centers. The economic impact study estimates the program has had a direct impact of \$59 million with a total impact of \$169 million through 2007 (Appendix A).

# CENTERS OF EXCELLENCE SUMMARY

## Funding

- State funding of \$25.4 million is leveraged with over \$100 million in private sector support for a total investment in excess of \$125 million.

## Private Sector Partners

- A total of 107 private sector companies are participating in the Centers of Excellence program.

## New Businesses

- Sixteen businesses are new or expanded.
- Twelve new companies (five spin-offs and seven companies with a new location in North Dakota) have been created to date as a result of the Centers of Excellence.
- Four companies have expanded as a result of the Centers of Excellence program.

## Jobs

- A total of 493 new direct jobs have already been created.
- The Centers support an estimated 771 additional, new jobs through partnerships.

## Economic Impact

- Estimated direct economic impacts of Centers and partner activities is \$59 million.
- Estimated total economic impact is \$169 million.
- Estimated sale and use tax collections is \$1.8 million.
- Estimated personal income tax collections is \$1.9 million.

## Centers of Excellence at Work

A closer look at a few of the Centers provides greater insight into some of the promising work to support new start-ups, generate private-sector driven research and provide workforce support for North Dakota businesses that are hungry for trained talent.

- The Center for Innovation at UND and the NDSU Technology Incubator are housing a combined 27 tenants and supporting more than 250 jobs.





- ✦ Canola research at the NDSU Center of Excellence for Agbiotechnology will help North Dakota canola growers increase revenues by up to \$66 million per year at current planting levels. This is the equivalent of 400 direct high-paying jobs.
- ✦ A partnership between the NDSU Center for Advanced Electronics Design and Manufacturing (CAEDM) and Appareo Systems resulted in three projects involving the building of prototypes for seven unique printed circuit boards. Appareo indicated that CAEDM is the first partner able to keep up with the fast pace of product development and prototyping.
- ✦ Valley City State University's Institute for Customized Business Solutions has provided customized training resulting in the creation of 92 jobs at Eagle Creek Software and eight other North Dakota jobs for total annual payroll of nearly \$4.4 million.
- ✦ Marvin Windows & Doors has been able to retain their jobs and business activities in a downward, contracting industry with assistance from the NDSU Center for Surface Protection.
- ✦ Dickinson State University's Strom Center for Entrepreneurship and Innovation has contributed to the creation of 140 jobs with \$3.28 million in total annual payroll at Killdeer Mountain Manufacturing (KMM), the Center's primary private sector partner.
- ✦ A total of 4,230 (duplicated) individuals have participated in 375 training sessions at the Williston State University Petroleum Safety and Technology Center.
- ✦ The UND Energy & Environmental Research Center's National Center for Hydrogen Technology has over \$42 million in new sponsored research contracts.
- ✦ The UND Unmanned Aircraft Systems Center of Excellence has collaborative working relationships with the Department of Homeland Security/Customs Border Protection and the North Dakota National Guard in Fargo through which 410 public sector UAS industry-related positions have been established in North Dakota.

# BACKGROUND

North Dakota legislators authorized funding for several pilot Centers of Excellence projects in the 2003 session before authorizing the full program. Those were the UND Center for Innovation in Grand Forks, the NDSU Center for Technology Enterprise and the NDSU Beef Systems Center of Excellence in Fargo. The Beef Center obtained its required private sector match in 2006, which only then allowed it to receive the previously authorized state funds.

In 2005, the Legislature approved Senate Bill No. 2032 expanding this concept into the Centers of Excellence in Economic Development program. It was proposed by Governor Hoeven and included in a package of initiatives advanced by House Majority Leader Rick Berg and the interim Economic Development Committee. The package called for a \$50 million state investment over multiple biennia to be leveraged on a 2-to-1 basis with private sector and federal dollars.

The Legislature approved \$20 million in the 2005-07 biennium, which launched 11 Centers throughout the state. During the 2007-09 biennium, the Centers of Excellence Commission approved \$19.45 million in awards, including seven new Centers. Some of these funds have not been distributed yet. The new projects are expected to leverage nearly \$39 million in matching funds from the private sector and other sources.

## Management and Oversight of Centers of Excellence

The Centers of Excellence project is overseen by a commission comprised of members from the State Board of Higher Education and the North Dakota Economic Development Foundation. The Centers of Excellence Commission manages the application process and makes funding recommendations for projects.

### North Dakota Economic Development Foundation:



**Mark Nisbet**  
*Chairman, North Dakota  
Principal Manager for  
Xcel Energy, Fargo*



**Tim Hennessy**  
*Regional President for  
U.S. Bank in Western  
North Dakota, Bismarck*



**Kathy Gaddie**  
*Dealer Operator of  
Ryan Chevrolet, Minot*

### State Board of Higher Education members:



**Duaine Espegard**  
*Retired Regional President,  
Bremer Financial,  
Grand Forks*



**Pam Kostelecky**  
*President and  
General Manager of  
Sax Motor Co., Dickinson*



**Sue Andrews**  
*Executive Director  
of the YMCA  
of NDSU, Fargo*

## Selection Process

Each proposed Center must complete an extensive application and approval process. The Centers of Excellence Commission reviews each proposal first, recommends whether or not it should be funded and stipulates any conditions for funding.

The Centers of Excellence Commission approves proposals based on the extent to which they meet the following criteria:

- Uses university or college research to promote private sector job growth, expansion of knowledge-based industries and development of new products, high-tech companies or skilled jobs;
- Promotes commercialization of new products and services;
- Fosters and practices entrepreneurship;
- Creates high-value private-sector employment opportunities in the state;
- Provides public-private sector involvement and partnerships;
- Leverages other funding;
- Increases research and development activities that involve federal funding;
- Becomes financially self-sustaining, and
- Establishes and meets deadlines for acquiring and expending all public and private funds specified in application.

Proposals must include detailed documentation of private-sector participation and the availability of \$2 in matching funds for each \$1 of state funds. Matching funds may include dollars raised in collaboration with private-sector partners and other funding entities and may include cash, in-lieu of cash and in-kind assets with itemized value. Private sector participation may be established through equity investments or through contracts for services with private sector entities. In making recommendations, the commission, board, foundation and budget section will give major consideration to the portion of the matching funds provided in cash by the private sector.

Each approved proposal is passed to the North Dakota Economic Development Foundation Board, the State Board of Higher Education and the Legislature's Budget Section for approval.

## Accountability

A Center must use the funds to enhance capacity and infrastructure and leverage state, federal and private funding sources. A Center may not use the funds to supplement funding for current operations or academic instructions or to pay indirect costs. Each Center is allowed only one round of funding per biennium.

The Centers of Excellence Commission is responsible for monitoring the Centers with assistance from the North Dakota Department of Commerce. The process includes site visits, third party audits and an in-depth annual review of each Center. Additionally, the Centers provide Commerce reports on major developments, timelines and substantial variations from their proposal.

The University of North Dakota Center for Innovation in Grand Forks and the North Dakota State University Center for Technology Enterprise and the Beef Systems Center of Excellence both in Fargo were funded prior to the creation of the Centers of Excellence Commission. They received funding direct from the legislature and therefore the Centers of Excellence Commission has no jurisdiction over them.

These three projects are not required to complete the annual review, but voluntarily submit to Commerce status reports of their key activities.

## Important Developments

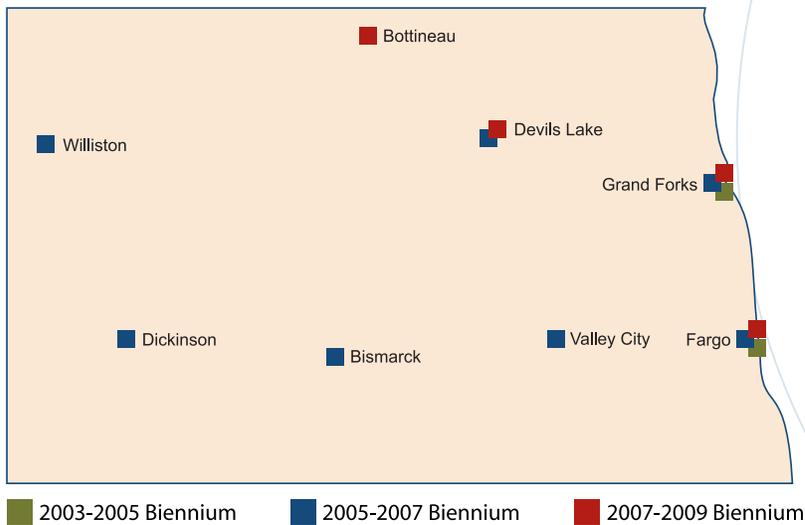
Two of the Centers approved in October 2007, the Minot State University Great Plains Knowledge and Data Center and the UND Center of Excellence for Biomedical Device Research, Development and Commercialization, have become unable to operate.

The Great Plains Knowledge and Data Center encountered a problem regarding ownership of equipment utilized during the COE project. The Center could not structure itself in a manner that accommodated its private sector partner's interests while at the same time remained consistent with the COE program legislation and requirements.

The Center of Excellence for Biomedical Device Research, Development and Commercialization was unable to secure the matching funds it had outlined in its application. The proposed Center's primary private sector partner was unable to raise the capital it had committed as a match for the project. The partner cited the downturn in economic conditions as the reason it was unable to participate in the project.

Neither Center had received a disbursement on their COE awards, which totaled \$4.6 million. As a result, funds from the two Centers were made available to applicants in the fall 2008.

## CENTER LOCATIONS



# Advanced Manufacturing CENTERS OF EXCELLENCE

## NORTH DAKOTA STATE UNIVERSITY

### Center of Advanced Electronics Design and Manufacturing

#### Purpose of Center

The Center of Advanced Electronics Design and Manufacturing (CAEDM) performs research and development for private sector partners and collaborators. CAEDM designs and tests wireless sensors, electronic systems and miniaturized electronics to address commercially relevant industrial problems posed by companies.

#### State and Matching Funds

Total COE Award: \$3,000,000

Approved: Dec. 5, 2005

Match Received to Date: \$9,906,778

Funded: February 2006

Anticipated Total Match: \$9,907,039

#### Private Sector Partners

Crane Wireless Monitoring Solutions, Appareo Solutions, Aldevron, Pedigree Technologies, Doosan Infracore (formerly Bobcat Company), Alien Technology

#### Project Summary and Highlights

- A relationship with NDSU and Crane Wireless Monitoring Solutions on Department of Defense projects enabled the transition of NDSU-Crane micro sensor fabrication methodology to Killdeer Mountain Manufacturing (KMM) in Killdeer, N.D. KMM has been manufacturing these military sensors for nearly a year.
- CAEDM's projects with Crane Wireless Monitoring Solutions (WMS) resulted in a supply agreement with Crane WMS and Phoenix International. The volume of manufacturing may lead to an increase in workforce of Phoenix International.
- A partnership with Appareo Systems resulted in three projects involving building small quantities of prototypes for seven unique printed circuit boards for initial market opportunity analysis. Appareo indicated that CAEDM is the first partner able to keep up with their fast pace of product development and prototyping. With recent FAA certification and sales of its Alerts™ (Aircraft Logging and Events Recording for Training and Safety) product, Appareo is growing fast and adding jobs. Ground was recently broken on a new building for Appareo in the NDSU Research and Technology Park. The Alerts™ product was cited as the "Aviation Week & Space Technology 2007 Product Breakthrough of the Year."
- Aldevron, LLC and CAEDM launched a project aimed at developing an automated robotic system and process that will enable Aldevron to achieve higher production rates with reduced variability between samples.
- Doosan Infracore, formerly Bobcat Company, teamed up with CAEDM on 11 projects since May 2006 to investigate advanced electronics that could result in manufacturing improvements or improved products to materials characterization relating to new product introduction.
- CAEDM personnel assisted Pedigree Technologies in the early phase of a major defense contract that Pedigree won, which has required significant additions to the Pedigree workforce.
- CAEDM personnel and facilities have been involved in seven small projects in support of Alien Technology's manufacturing site in Fargo.
- The Center has been involved in a partnership that has won a large federal RFID project. Terms of the contract preclude naming the private-sector partner or the source funding. The project was initiated in 2007 and is nearly complete.
- NDSU added two employees at \$170,000 total annual payroll as a result of the Center.
- CAEDM continues to co-sponsor and facilitate NDSU's Annual Technology Transfer and Entrepreneurship Workshop at the Research and Technology Park.
- CAEDM has assisted North Dakota State College of Science (NDS-CS) launch the Center for Nanoscience Technician Training (CNTT). The CNTT's objective is to produce more technicians in nanoscience and microelectronics. CAEDM and NDSU have assisted NDS-CS by training faculty and providing facilities and guidance.

# Advanced Manufacturing CENTERS OF EXCELLENCE

## NORTH DAKOTA STATE UNIVERSITY Center for Surface Protection

### Purpose of Center

The Center for Surface Protection (CSP) is focused on research that addresses industrial problems for North Dakota companies. Research on surface protecting coatings will enhance the durability of manufactured products. The Center creates, designs and develops organic and inorganic soft and hard coatings and application methods to meet industry needs.

The CSP's second Center of Excellence award focuses on working with private sector partners to develop new materials, improve industrial products and provide technical services such as testing. Research continues to focus on creating, designing and developing new hard and soft coatings. The new coatings systems proposed will have improved corrosion, erosion and wear properties.

The CSP was approved for its initial Centers of Excellence award of \$2 million in March 2006. The Center was approved for a second Centers of Excellence award of \$2 million in fall 2007.

### State and Matching Funds

Total COE Award: \$4,000,000

Approved: March 8, 2006

Match Received to Date: \$3,632,122

Funded: May 2006

Anticipated Total Match: \$8,000,000

### Private Sector Partners

Gremada Industries (now Caterpillar, Inc.), Marvin Windows and Doors, Akzo Nobel Aerospace Coatings

### Project Summary and Highlights

- The Center for Surface Protection and Akzo Nobel Aerospace Coatings personnel are working collaboratively to advance a unique magnesium-rich coating material in both the laboratory and in large field studies. This primer technology could be used worldwide to protect aluminum used in airplanes and other aerospace applications from corrosion.
- A successful initial project with the CSP has prompted Marvin Windows and Doors to request a second set of experiments. Discussions regarding long-term research programs with NDSU have occurred. The CSP has been instrumental in helping Marvin retain its North Dakota workforce in an industry that is contracting during a downturn in the U.S. economy.
- Gremada Industries was purchased by Caterpillar, Inc. effective July 1, 2008. Caterpillar, Inc. recognizes the value of the established partnership with NDSU and continues to honor the terms and conditions of the original COE project agreement with Gremada. To date, Gremada/Caterpillar has created one job as a result of its partnership with the CSP.
- Research demands at the CSP have created six jobs at NDSU at \$365,500 total annual payroll. An additional research associate has been hired and was expected to begin employment in 2008.
- CSP personnel have given presentations at the European Coatings Expo in Nuremburg, Germany, and the International Coatings Expo in Toronto, Canada. Such presentations give the Center and the State of North Dakota a significant presence in the global marketplace.



# Advanced Manufacturing CENTERS OF EXCELLENCE

## NORTH DAKOTA STATE UNIVERSITY Center for Integrated Electronic Systems

### Purpose of Center

The Center for Integrated Electronics Systems will perform research and development projects to integrate electronic hardware and software systems. Such projects will enable private sector partners to create and manufacture new and/or improved high technology products, generate more revenue and profit, and/or be more competitive in the global marketplace.

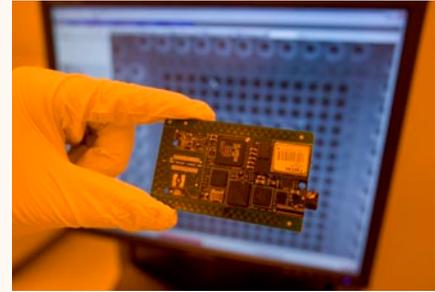
### State and Matching Funds

Amount Approved: \$2,050,000

Anticipated Match: \$4,100,000

Approved: September 2008

Funded: n/a



### Private Sector Partners

Bobcat, Pedigree Technologies, Intelligent InSites, Datacom International

### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008. It was initially approved by the Centers of Excellence Commission and ultimately received approval from the Legislative Budget Section.
- The Center currently is working to secure the required match and has not yet received its first disbursement of state funds.

# Aerospace CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA Unmanned Aircraft Systems Center of Excellence

### Purpose of Center

The Unmanned Aircraft Systems Centers of Excellence (UAS COE) performs research and development of UAS technologies and applications and promotes commercialization of new UAS-related products and services. The UAS COE strives to attract new UAS-related business ventures to North Dakota and to promote private sector job growth within the state.

The UAS COE's second Center of Excellence award focuses on education and training for integration of UAS into civilian airspace, flight performance research for pilots and ground station cockpit environments and research and development on UAS payload sensors.

The UAS COE was approved for its initial Centers of Excellence award of \$1 million in March 2006. The Center was approved for a second Centers of Excellence award of \$1.5 million in fall 2007.

### State and Matching Funds

Total COE Award: \$2,500,000

Approved: March 8, 2006

Match Received to Date: \$6,351,486

Funded: May 2006

Anticipated Total Match: \$7,994,919

### Private Sector Partners

AAI/Aerosonde, American Crystal Sugar Company, Appareo Systems, Boeing, Cirrus Design, Composite Engineering, Crew Training International (CTI), Diamond Aircraft, Frasca International, General Atomics, General Dynamics, Ideal Aerosmith, Killdeer Mountain Manufacturing, Laserlith Corporation, Lockheed Martin, Mayo Clinic, Microsoft Corporation, Micro Systems Technology, Northrup Grumman, Raytheon, Science Applications Intl. Corp., SEO Precision, Unmanned Applications Group

### Project Summary and Highlights

- The UAS COE reports that it has created 26 jobs with an additional 23 graduate and undergraduate positions.
- The UAS COE has collaborative working relationships with the Department of Homeland Security/Customs Border Protection and the North Dakota National Guard in Fargo through which 410 public sector UAS industry-related positions have been established in North Dakota.
- Laserlith Corporation, based in California, has established a presence in Grand Forks and projects up to 100 manufacturing jobs will be created by year five of the Centers of Excellence project. Senator Dorgan has sponsored two \$3-million pieces of legislation in FY08 and FY09 Defense bill for Laserlith of Grand Forks to develop and manufacture UAS steering antennas.
- The UAS COE has met with the Grand Forks Region Base Realignment Impact Committee (BRIC) to seek ways for the UAS civilian industry development to compliment the realignment of the Grand Forks Air Force Base mission.
- Two UAS Action Summits were facilitated by UND in conjunction with the Red River Valley Research Corridor. A third summit is planned for spring 2009. These summits draw national and international attention to UND as well as the state of North Dakota as a leader in the development of the civilian UAS industry.
- The UAS COE has attended/presented at 16 national and international UAS conferences and has published/presented over 170 scientific research papers. These efforts have enhanced the Center's reputation within the industry.
- The UAS COE has completed successful trials at Camp Grafton (North Dakota) and Camp Ripley (Minnesota) where several different payloads were tested.
- The United States Air Force Battle Lab funded a \$3.76 million contract to research the UAS sense and avoid issue. An additional \$7 million has been secured through FY09 to continue the effort.
- The UAS COE partnered with Science Applications International Corporation and Crew Training International to win a five-year \$50-million USAF contract to train Air Force predator pilots at Creech AFB, Nevada.

# Aerospace CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA

### Center of Excellence in Space Technology and Operations

#### Purpose of Center

The Center of Excellence in Space Technology and Operations will conduct research using a network of satellites that continually take atmospheric measurements simultaneously in hundreds of places around the world. This technique is new, yet well demonstrated, and will dramatically improve weather forecasts and provide data of unrivalled accuracy and resolution.

#### State and Matching Funds

Amount Approved: \$1,000,000

Anticipated Match: 3,778,266

Approved: September 2008

Funded: n/a



#### Private Sector Partners

GeoOptics LLC and Broad-Reach Engineering

#### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008. It was initially approved by the Centers of Excellence Commission and ultimately received approval from the Legislative Budget.
- The Center currently is working to secure the required match and has not yet received its first disbursement of state funds.

# Agricultural CENTERS OF EXCELLENCE

## LAKE REGION STATE COLLEGE

### Dakota Center for Technology-Optimized Agriculture

#### Purpose of Center

The Dakota Center for Technology-Optimized Agriculture (DCTOA) aims to become the premier center for technological applications in North American agriculture. This Center supports entrepreneurship and the creation of technologies that generate new jobs in North Dakota agriculture. Products generated by this Center will help North Dakota farmers and ranchers lower input costs, increase profitability and increase net margins.

The DCTOA's second Centers of Excellence award focuses on developing technologies that increase knowledge of soil profiles, crop needs and the use of manure nutrients.

The DCTOA was approved for its initial Centers of Excellence award of \$450,000 in December 2005. The Center was approved for a second Centers of Excellence award of \$400,000 in fall 2007.

#### State and Matching Funds

Total COE Award: \$850,000

Approved: Dec. 5, 2005

Match Received to Date: \$806,345

Funded: February 2006

Anticipated Total Match: \$2,160,050

#### Private Sector Partners

Agri ImaGIS Technologies., Total Crop Farming Systems, Verdi-Plus, Airborne Data Systems, Inc., Farmers Edge Precision Consulting, Inc., J.R. Simplot Company, Twete Incorporate

#### Project Summary and Highlights

- The DCTOA has been involved in trials at four different farms over the past three years to test and demonstrate the effectiveness of variable-rate placement of crop nutrients. Two additional farms will participate in trials to be held in 2009. The trials respond to research questions posed by the DCTOA's private sector partners.
- New projects expected to be initiated by the DCTOA during 2009 include a soybean oppositional seeding trial, a manure slurry injection tool field test and a collaborative study with the University of Iowa.
- The Center has developed 16 educational modules for use by farmers who are considering implementing precision farming techniques. Upon completion, the modules will be placed on e-College, LRSC's distance learning platform.
- The DCTOA and its private sector partners conduct instructional seminars, training sessions, demonstrations and field days to create awareness and to educate potential users of the technology employed by the Center.
- The Center reports that five jobs have been created thus far at \$206,560 total annual payroll.
- Two start-up companies, Verdi-Plus and Site-Specific Agriculture, have been generated by the Center's efforts.
- Two existing companies have benefited from their relationship with the DCTOA. Agri ImaGIS Technologies has dramatically expanded the services it offers, while Total Crop Farming Systems Inc., based in Langdon, has opened another office in Washburn.



# Agricultural CENTERS OF EXCELLENCE

## **NORTH DAKOTA STATE UNIVERSITY** **Center of Excellence for Agbiotechnology**

### Purpose of Center

The Center of Excellence for Agbiotechnology concentrates on the long-term research, development and outreach needed to improve technology, increase farm income and support growth of oilseed agriculture in North Dakota. The Center focuses on encouraging commercial issues and commercializing traits in grains and oilseeds for food and nonfood uses. The Center will make available lines of canola that have potential as biofuels, specialty lubricants and health care products.

The Center's second Centers of Excellence award focuses on improving canola growth to meet the increasing demand of bio-fuel and on evaluating products for commercial use. This project will expand the Center by developing lines of canola that are adapted to acres south and west of the traditional canola growing region.

The NDSU Center of Excellence for Agbiotechnology was approved for its initial Centers of Excellence award of \$2 million in March 2006. The Center was approved for a second award of \$1.5 million in fall 2007.

### State and Matching Funds

Total COE Award: \$3,500,000

Approved: March 8, 2006

Match Received to Date: \$10,875,000

Funded: May 2006

Anticipated Total Match: \$16,803,439

### Private Sector Partners

Monsanto Co., Archer Daniels Midland, Inc. (ADM)

### Project Summary and Highlights

- The Center's canola research is helping to increase yields, reduce risks and improve profits for North Dakota canola producers. Economic modeling shows that the value of the work to date would result in an increase to North Dakota canola growers of \$20-\$66 million per year at current planting levels. This is the equivalent of 400 direct high-paying jobs.
- Trials conducted in 2007 saw an increase in oil content per acre of more than 12 percent. Trials conducted in 2008 resulted in similar increases.
- On Oct. 10, 2007 the first canola crushing and biodiesel plant in North Dakota held its ribbon cutting. The plant owned by ADM and located in Velva, employs 85 people. Research at the Agbiotechnology Center of Excellence will help North Dakota farmers grow crops necessary to support biofuels and other value-added agriculture products.
- The Center reports that five jobs at \$216,000 total annual payroll have been created.
- The COE partners meet three times per year to review progress, outstanding issues, and initiatives for the forthcoming period. Private sector partners also provide ideas in terms of future efforts, suggest ways to improve on the Center's operations and make specific recommendations for research topics.
- As a result of the Center's collaborative efforts, elite canola lines adapted to North Dakota have been identified. Those lines are superior for seed oil content and yield of oil per acre when compared with commercial hybrid checks. Six of those lines are being prepared and tested for potential release in 2009. The elite material can be used either as commercial cultivars or source of germplasm to enhance private canola breeding efforts in the region.
- The Center coordinated a project with Monsanto where the goal is to manage and evaluate a field trial that compares the elite canola release for multiple companies. This project enhances North Dakota agricultural production practices by providing an unbiased evaluation of the best germplasm to be used for canola production.
- New elite canola germplasm lines are being advanced and increased in counter-season in Chile under a cooperative agreement with Monsanto.
- The Center collaborates with Research Extension Centers in Minot, Langdon and Carrington.
- The Center has shifted its focus from open pollination to hybrids, which offer higher yields and have begun to dominate the industry.

# Agricultural CENTERS OF EXCELLENCE

## **NORTH DAKOTA STATE UNIVERSITY** **Beef Systems Center of Excellence**

### Purpose of Center

Legislation in 2003 authorized the Beef Systems Center of Excellence (BSCE) to create a model for developing an integrated meat processing industry, to enhance North Dakota State University's animal sciences research, training and outreach capabilities, and to provide training, education and outreach to the wide variety of people involved in the beef business. The Center takes a "pasture to plate" approach with expertise in a variety of disciplines involved in beef cattle production and meat science.



The purpose of the Center is to create a model for a coordinated meat processing industry that could be implemented in other parts of the state, region or country. The Center also looks to enhance NDSU's ability to provide leading research, evaluate new and emerging technologies, and provide data on meat and meat marketing.

### State and Matching Funds

State Funds: \$800,000

Funded: October 2007

Total Match: \$2 million

### Private Sector Partners

North Dakota Natural Beef, LLC, North American Bison Cooperative

### Project Summary and Highlights

- The BSCE is co-located at North Dakota Natural Beef's new processing plant in Fargo. The processing plant is nearing completion with operations expected to begin in early 2009.
- The new processing plant will use animals slaughtered at the Bison plant in New Rockford. The completed facility will accommodate 250 animal carcasses per day.
- The Center will provide North Dakota students educational opportunities that were previously unavailable in the state.
- The creation of the BSCE has allowed NDSU faculty to be more competitive for a variety of grant proposals and to better serve the needs of the meat processing industry in the state.

# Agricultural CENTERS OF EXCELLENCE

## MINOT STATE UNIVERSITY BOTTINEAU Entrepreneurial Center for Horticulture

### Purpose of Center

The Entrepreneurial Center for Horticulture will research and demonstrate production methods and provide new opportunities for product commercialization and distribution networks in North Dakota and the region.

### State and Matching Funds

Amount Approved: \$400,000  
2008

Approved: September

Anticipated Match: \$830,854

Funded: n/a



### Private Sector Partners

North Star Organic Farm, North Dakota Farmers Market and Growers Association

### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008. It was initially approved by the Centers of Excellence Commission and ultimately received approval from the Legislative Budget Section.
- This Center is currently working to secure the required match and has not yet received its first disbursement of state funds.

# Energy CENTERS OF EXCELLENCE

## UND ENERGY & ENVIRONMENTAL RESEARCH CENTER National Center for Hydrogen Technology

### Purpose of Center

Designated as the National Center for Hydrogen Technology (NCHT) by the U.S. Department of Energy, this Center of Excellence is conducting technology research, development, demonstration and commercialization projects for the production and use of hydrogen as a practical fuel. In conjunction with private sector partners, the Energy & Environment Research Center (EERC) is leading the way to develop the hydrogen gas station of the future, to produce hydrogen from fossil and renewable fuels and to use hydrogen in combustion engines and turbines. Working with private companies to develop and commercialize hydrogen technology will provide future employment and economic development opportunities in North Dakota through new corporate offices in North Dakota as well as new businesses.



### State and Matching Funds

Total COE Award: \$2,500,000

Approved: Dec. 5, 2005

Match Received to Date: \$42,200,756

Funded: February, 2006

Anticipated Total Match: \$42,200,756

### Private Sector Partners

TXU Generation Company, Air Products and Chemicals, Inc., Xcel Energy, Minnesota Corn Research Council, North Dakota Corn Utilization Council, Basin Electric Power Cooperative, Pratt & Whitney Rocketdyne, Inc., BMC Construction, North American Coal Corporation, Siemens Power Generation, Inc., SGL Carbon Group, IdaTech, Great River Energy, Rio Tinto, Diversified Energy Corporation, Advanced Biomass Gasification Technologies, Inc., Biomass Energy Solutions, Inc., Xethanol Corporation, Westmoreland Coal Sales Company, Agricultural Utilization Research Institute, ePower Synergies, Catacel Corporation, Franklin Fuel Cells, United Technologies, Chippewa Valley Ethanol, Resurface Corporation, Stelios Arvelakis, Electric Power Research Institute, Porvair plc., Energy Conversion Devices, Inc., ThermoChem Recovery International, Inc., Clean Earth Solutions, Inc., Aboriginal Cogeneration Corporation, Conoco Phillips, CH2MHill, Inc.

### Project Summary and Highlights

- The EERC reports it has added 25 jobs at \$1,320,217 total annual payroll.
- The NCHT dedicated its new building Sept. 5, 2008. The 15,000 square foot, \$3.5 million facility was designed to significantly enhance the research, development, testing and commercialization of hydrogen and fuel cell technologies at the EERC. The facility includes a 30-foot-high demonstration area and highly specialized laboratory space with state-of-the-art equipment.
- Sponsored research activities total over \$42 million in new funding.
- The EERC is a completely self-sustaining institution.
- Development of a new biomass gasification company located in Grand Forks is currently under way and is expected to be finalized in 2009.
- The NCHT is working with the North Dakota Corn Utilization Council to create a new North Dakota business to commercialize a technology to produce fertilizer from North Dakota resources.
- Pratt & Whitney Rocketdyne established a corporate partner office at the EERC in Grand Forks as a direct result of its NCHT projects.

# Energy CENTERS OF EXCELLENCE

## BISMARCK STATE COLLEGE National Energy Center of Excellence

### Purpose of Center

The National Energy Center of Excellence's (NECE) vision is to be a worldwide leader in energy education and training for the energy industry. Partnerships with the North Dakota energy industry allow the facility to meet the demands of the 21st century workforce by building a pipeline of multi-skilled workers. The efforts of this Center enable students and energy companies to succeed in a competitive, ever-changing industry.

### State and Matching Funds

Total COE Award: \$3,000,000

Approved: Dec. 5, 2005

Match Received to Date: \$5,884,169

Funded: February, 2006

Anticipated Total Match: \$7,342,000

### Private Sector Partners

Archer Daniels Midland Co., Basin Electric Power Cooperative, Great Northern, Headwaters, Montana Dakota Utilities, North Dakota Biodiesel, Red Trail Energy, Spiritwood Station, Tesoro



### Project Summary and Highlights

- The National Energy Center of Excellence held its ribbon cutting ceremony on Sept. 29, 2008, celebrating the completion of the \$18.3 million facility. The Center boasts 106,200 square feet of highly energy efficient space.
- In 2007 the U.S. Secretary of Energy officially designated BSC as the National Power Plant Operations Technology and Education Center. The designation recognizes BSC as the premier national center of education and training for operators and technicians in the energy industry.
- The simulation system WebLab®, developed by BSC, is incorporated in the curriculum and allows students to control energy technology laboratory equipment via the Internet. Students build hands-on skills and experience as they take control of the power generation and distribution system of a model city.
- BSC now offers a bachelor of applied science degree in energy management in addition to five associate degree energy programs and non-credit training.
- The Center has partnered with Basin Electric Power Cooperative to implement a "Grow Your Own" internship program. Eligible students may apply for internships at Basin's three power plants. Upon completion of the program, students may be offered a position. If offered full-time employment, tuition reimbursements will be awarded based upon pre-established guidelines.
- BSC has partnered with Turtle Mountain Community College (TMCC) to offer its process plant technology program online to TMCC students. The partnership graduated its first students in 2008.
- BSC has developed separate education and training partnerships with the U.S. Navy, U.S. Army and U.S. Air Force.
- Private sector partners work alongside BSC to refine the instructional curriculum to assure it reflects the demands of the 21st century energy industry. Additionally, six private sector companies have provided job shadow opportunities for BSC students at North Dakota energy facilities since 2006.
- Over the next 10 years, the Center reports that 728 new jobs are projected as new or expanded facilities become operational.

# Energy CENTERS OF EXCELLENCE

## **WILLISTON STATE COLLEGE** **Petroleum Safety and Technology Center**

### Purpose of Center

The Petroleum Safety and Technology Center (PSTC) trains workers for the oil and gas industry. The Center works closely with its industry partners to develop and maintain state-of-the-art training programs. The hands-on training sessions are designed to help oil and gas production workers work safely and efficiently.

### State and Matching Funds

Total COE Award: \$400,000

Match Received to Date: \$1,183,044

Anticipated Total Match: \$1,183,044

Approved: March 8, 2006

Funded: May 2006



### Private Sector Partners

Hess Corporation, Vetco Gray, Marathon Oil, Nabors Drilling, Key Energy, St. Mary Land and Exploration (aka: Nance Petroleum), Halliburton Energy Services, Weatherford Services, Baker Oil Tools, Schlumberger, National Oilwell Inc., Howard Supply, Capital Safety, Modern Machine, Interstate Powersystems, Stewart and Stevenson, Hickman Sales and Service, Williston Fire and Safety, GC Products

### Project Summary and Highlights

- The Center reports that its private sector partners have created 66 new jobs so far.
- Over 100 oilfield-related businesses have requested training from the PSTC.
- The 40-Hour New Hire Training Program has had 322 participants in 35 classes.
- The 8-16-24-Hour Safety Awareness classes have educated 1,070 individuals in 106 classes.
- A total of 4,230 participants have taken part in over 375 safety training classes offered by the PSTC.
- The Center has partnered with Turtle Mountain Community College and Fort Berthold Community College in the delivery of the Floorhand for Well Servicing Program. The 40-Hour Safety Training program was also delivered at each of these two colleges.
- The Center reports that 1,200 people are projected to be hired through 2010 to fill the industry need.

# Energy CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA

### Petroleum Research, Education, and Entrepreneurship Center of Excellence

#### Purpose of Center

The focus of the Petroleum Research, Education, and Entrepreneurship Center of Excellence is to improve our understanding of the Williston Basin oil deposit, with special attention to the Bakken Formation. The Center aims to develop enhanced oil recovery techniques as well as techniques for CO2 sequestration. Other Center objectives are to develop geothermal systems using oil field waters to generate electrical power and to address other challenges and opportunities relating to petroleum exploration and production.



#### State and Matching Funds

Amount Approved: \$3,000,000

Approved: September 2008

Anticipated Match: \$7,958,373

Funded: n/a

#### Private Sector Partners

Schlumberger, HIS, American Petroleum Institute, Five ND petroleum operators: Encore Acquisition Company, Hess Corporation, Marathon Oil Corporation, St. Mary Land & Exploration Co., Whiting Petroleum Corporation

#### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008. It was initially approved by the Centers of Excellence Commission and ultimately received approval from the Legislative Budget.
- This Center is working to secure the required match and has not yet received its first disbursement of state funds.

# Energy CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA

### **Sunrise BioProducts: A Center of Excellence for Chemicals, Polymers and Composites from Crop Oils**

#### Purpose of Center

The purpose of SUNRISE is to invent, develop and commercialize green industrial chemicals, polymers and fiber composites using crop oils as the primary raw material. The mission of SUNRISE is to 1) conduct research that contributes to solving energy-related problems, 2) research and develop improved crop-based options for fuels, chemicals and polymers that are currently produced from fossil fuels, 3) increase UND and NDSU research competitiveness in chemicals, polymers and composites from crop oils, and 4) produce graduates to support growth in this industry in North Dakota.

#### State and Matching Funds

Amount Approved: \$2,950,000

Approved: September 2008

Anticipated Match: \$9,165,132

Funded: n/a

#### Private Sector Partners

SUNRISE Renewables; Bayer CropScience, Northwood Mills; Kadrmas, Lee, and Jackson, Global Agricultural Solutions

#### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008. It was initially approved by the Centers of Excellence Commission and ultimately received approval from the Legislative Budget Section.
- This Center is working to secure the required match and has not yet received its first disbursement of state funds.

# Life Sciences CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA RESEARCH FOUNDATION

### Center of Excellence in Life Science and Advanced Technologies

#### Purpose of Center

The Center of Excellence in Life Science and Advanced Technologies (COELSAT) is focused on commercializing research into products that are developed and made in North Dakota.

#### State and Matching Funds

Total COE Award: \$3,500,000

Match Received-to-Date: \$10,606,298

Anticipated Total Match: \$11,047,425

Approved: March 8, 2006

Funded: March 2007



#### Private Sector Partners

PCL/Perkins & Will, UNDRF/BORDERS, Avianax, Alion Science and Technology, Ideal Aerosmith, Novadigm, Laserlith, Sunrise Renewable Company, DMD, Dakota Harvest

#### Project Summary and Highlights

- Construction of the 50,000-square-foot, state-of-the-art, secured facility is nearing completion. The first tenants have begun moving into the building. Center leadership reports the COELSAT is near capacity and will have room for only one additional tenant.
- UNDRF/BORDERS is a North Dakota company successful in creating eight jobs at \$440,000 total annual payroll and anticipates 120 jobs to be created between corporate partners and UNDRF by 2009 as a result of continued partnerships.
- Avianax is a North Dakota startup company and Sunrise Renewable Company has formed a presence in North Dakota as a result of their partnership with COELSAT.
- Avianax and Aldevron are partnering on research projects that have led to the formation of Schiltz Farms in Tolna. Three employees have been hired and 12 to 14 more employees are projected.
- Ideal Aerosmith and Laserlith have identified a project to collaborate on, which grew out of their co-presence in the COELSAT facility.

# Life Sciences CENTERS OF EXCELLENCE

## NORTH DAKOTA STATE UNIVERSITY

### Center for Biopharmaceutical Research and Production

#### Purpose of Center

The Center for Biopharmaceutical Research and Production will design, develop and produce biopharmaceutical products including efficient DNA vaccines. The Center will fuel biopharmaceutical and life sciences sectors to discover and develop new vaccines and other biopharmaceuticals to treat some of the most challenging diseases facing humankind. The Center's long-term goal is to develop vaccines and biopharmaceutical products as well as encompass pre-clinical and clinical studies in conjunction with its private sector partners.

#### State and Matching Funds

Amount Approved: \$2,000,000

Anticipated Match: \$4,742,000

Approved: September 2008

Funded: n/a

#### Private Sector Partners

Aldevron, Clinical Supplies Management (CSM), ParaClin, PRACS Institute, MeritCare

#### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008 after receiving approvals from the Centers of Excellence Commission and the Legislative Budget Section.
- This Center is working to secure the required match and has not yet received its first disbursement of state funds.



# Life Sciences CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA RESEARCH FOUNDATION Center of Excellence for Passive Therapeutics

### Purpose of Center

The purpose of the Center of Excellence for Passive Therapeutics is to develop passive (antibodies) therapeutics from agriculture products for people exposed to or infected with viral infections or diseases. Once shown effective in pre-clinical and clinical trials, therapeutic products using antibodies from goose eggs will be produced in their entirety in North Dakota.

### State and Matching Funds

Amount Approved: \$2,650,000

Approved: September 2008

Anticipated Match: \$8,400,000

Funded: n/a

### Private Sector Partners

Mayo Clinic, Avianax, Aldevron, Schiltz Goose R&D, Schiltz Goose Farms, North

### Project Summary and Highlights

- This Center was authorized for a Centers of Excellence Grant in September 2008 after receiving approvals from the Centers of Excellence Commission and the Legislative Budget Section.
- This Center is working to secure the required match and has not yet received its first disbursement of state funds.

# Technology & Entrepreneurial CENTERS OF EXCELLENCE

## UNIVERSITY OF NORTH DAKOTA Center for Innovation

### Purpose of Center

The first North Dakota Center of Excellence, the Ina Mae Rude Entrepreneur Center, was opened in January 2005 and supports North Dakota entrepreneurs by helping launch new ventures, commercialize new technologies and secure access to capital from private and public sources. In 2003, the Legislature allocated \$800,000 to support the Entrepreneur Center at the Center for Innovation Foundation.

### State and Matching Funds

State Funds: \$800,000

Funded: October 2003

Total Match: \$3.5 million of which \$2.65 million is from entrepreneur donors



### Project Summary and Highlights

- Since January 2005, the Center for Innovation has helped create 172 jobs with an estimated total payroll of \$8.21 million in 51 businesses.
- The Center is currently housing 19 businesses and has incubated 62 businesses (with student ventures) in the past three years.
- The Center has developed nine angel funds around the state engaging more than 110 angel investors.
- The Center hosts the Dakota Venture Group, the nation's first student-run venture fund which has a triple-bottom line function of investment return, entrepreneur finance education for students and funding new ventures in North Dakota including syndication with angel investors.
- The Center has been ranked in the top 1 percent of 2,300 entrepreneurship programs nationwide by Entrepreneur Magazine and Princeton Review and has received six National Awards for Excellence in innovation and entrepreneurship. The Center is one of twelve incubators worldwide designated as a "Soft Landings International Incubator" by the National Association of Business Incubators because of its assistance to companies expanding internationally.
- The Center provides educational content for the Innovate ND program as well as assists program participants with entrepreneur development such as business planning, financial projections and gaining access to capital.
- The Center houses 14 offices with over 140 workstations featuring an extensive IT infrastructure and Wet Lab. The Center's average occupancy is 85 to 90 percent. The incubator is known as the most high-tech, multi-tenant facility in North Dakota.
- Two profile companies are Datacom International, which has operations at the incubator and in Cooperstown, and Ntractive, a top five winner of the Innovate ND competition, which has a dedicated server room in the incubator. Both companies received a majority of their start-up funds from angel investors.

# Technology & Entrepreneurial CENTERS OF EXCELLENCE

## NORTH DAKOTA STATE UNIVERSITY Technology Incubator

### Purpose of Center

The Technology Incubator, located in the NDSU Research & Technology Park, houses high growth start-up companies doing research and development while offering students an opportunity to gain real-world experience working for entrepreneurs. Originally called the Center for Technology Enterprise, The Technology Incubator received \$1.25 million in funding from the North Dakota Development Fund in 2005.

The Technology Incubator currently has eight tenants. The incubator staff offers technical assistance in numerous areas such as developing business and marketing plans, financing/venture capital, commercialization services, university relationships and strategic planning.



### State and Matching Funds

State Funds: \$1.25 million

Funded: November 2004

Total Match: \$6,150,000

### Project Summary and Highlights

- The Technology Incubator opened its 52,600-square-foot building in March 2007.
- The incubator and its 8 tenants have 96 total employees with a total annual payroll of \$5.87 million.
- The Technology Incubator will see its first “graduate” invest in its own facility in 2009 when incubator tenant, Appareo Systems, moves into its new, multi-tenant facility to be located in the NDSU Research and Technology Park.
- The incubator increases entrepreneurial awareness by hosting regular educational events and forums.
- The incubator has an advisory board consisting of various professional disciplines that provide a link to the business community.
- A new coaching and mentoring program is being developed to provide assistance to entrepreneurs located in The Technology Incubator.
- A Virtual Incubator will soon be launched to provide rural entrepreneurs with access to The Technology Incubator’s programs and services.
- Over 20 students are working directly with clients in The Technology Incubator.

# Technology & Entrepreneurial CENTERS OF EXCELLENCE

## VALLEY CITY STATE UNIVERSITY

### Institute for Customized Business Solutions–Enterprise University

#### Purpose of Center

The basic purpose of the Enterprise University (EU) at Valley City State University (VCSU) is to support private sector partners through the training of people who are highly skilled with software that is designed to support an entire enterprise. The Center develops customized coursework and training programs targeted at the specific needs of its business partners. Program graduates have the skills to pursue careers in high-demand technology fields. The Center's Enterprise Application Model (EAM) is a unique approach to information technology services used to attract, grow and create information technology businesses to meet national demand for high-quality and reasonable costs in enterprise IT services.

#### State and Matching Funds

Total COE Award: \$1,000,000

Approved: March 8, 2006

Match Received to Date: \$5,020,703

Funded: May 2006

Anticipated Total Match: \$5,020,703

#### Private Sector Partners

Alliance Pipeline, Microsoft, Atidan

#### Project Summary and Highlights

- Eagle Creek Software is a Minnesota company that, with the help of the Enterprise University, has expanded to Valley City. Eagle Creek has 92 employees of which 51 have successfully completed the training program offered by the EU.
- An advisory council of regional industry leaders was formed to identify IT talent needs, shape the business plan and identify growth opportunities for the Center.
- The EU has influenced and supported an effort at VCSU to add SAP and Microsoft business process management software applications to the curriculum. VCSU students have gained valuable experience and have enhanced their ability to meet the needs of North Dakota businesses.
- The EU has a pending contract with Microsoft to deliver training courses to Microsoft's partners.
- The EU has established a partnership with Alliance Pipeline to provide SAP training to their employees.
- The Center has partnered with Atidan, LLC to develop training materials for an update to one of its client's Customer Relationship Management software.
- The EU has partnered with the NDSU Research Technology Park to develop a Virtual Incubator website based on Microsoft SharePoint. The Center will create SharePoint training based on the knowledge acquired in the project.
- The EU has collaborated with the Information Technology Council of North Dakota and contributed towards their "IT Career Awareness Program."

# Technology & Entrepreneurial CENTERS OF EXCELLENCE

## DICKINSON STATE UNIVERSITY

### Strom Center for Entrepreneurship and Innovation – Institute for Technology and Business

#### Purpose of Center

The Strom Center for Entrepreneurship and Innovation – Institute for Technology and Business is focused on helping technology-based businesses start or expand in rural North Dakota. The Institute identifies new technology-related opportunities and helps businesses adapt and implement new technologies and leadership strategies for growth.

The Center has developed a customized leadership program and delivered it to private sector partner, Killdeer Mountain Manufacturing. The program is designed to be adaptable to other companies that may be interested in the program.

#### State and Matching Funds

Total COE Award: \$1,150,000

Approved: June 14, 2006

Match Received to Date: \$4,144,293

Funded: October 2006

Anticipated Total Match: \$4,501,293

#### Private Sector Partners

Killdeer Mountain Manufacturing (KMM)

#### Project Summary and Highlights

- The customized leadership program has been expanded to include a certificate program in entrepreneurial leadership. The program will help present leaders and help identify potential leaders. A communications course was also developed and added to the program. The program enhancements were developed following a recommendation from Boeing Corporation, one of KMM's chief clients.
- The first course in the customized entrepreneurial leadership program was offered in fall semester 2007 with the second course offered spring semester 2008. A total of 95 participants attended one or both courses.
- The Center reports that its efforts have contributed to the creation of 140 new jobs at \$3.2 million total annual payroll through their partnership with KMM. The Center has supported KMM's expansion in the areas of accounting, human resources, information technology and leadership development.
- A pre-engineering program has been developed in cooperation with North Dakota State University (NDSU). Students will enroll at Dickinson State University for their first two years of engineering education and then transfer to NDSU to complete the program. The intent is that their senior project may involve KMM or another company in the Dickinson region. The objective of the program is not only to produce more engineers, but also to encourage engineering students from western North Dakota to return to the region upon graduation.
- The Center redesigned and maintains a local website, [www.dickinsonnd.com](http://www.dickinsonnd.com), which was developed as a recruiting tool for Dickinson and the southwest area.
- The Center has spearheaded the revision and expansion of the Dickinson Community Profile which is used by a variety of organizations as a marketing tool for relocation.

# APPENDIX A

## Economic Impact Study

### Economic Impact of North Dakota Centers of Excellence Program, 2007

*F. Larry Leistritz, Dean A. Bangsund, and Nancy M Hodur<sup>1</sup>*

In recent years, economic development has become increasingly linked to technology and information. As a result, policy makers have attempted to facilitate partnerships between universities and private sector businesses. The success of public-private partnerships in areas like the Silicon Valley of California, the Research Triangle of North Carolina and the Austin, Texas area offers support for the concept of technology-based development. The Centers of Excellence program is North Dakota's initiative to participate in technology and information-based economic development.

The 2003 Legislative session authorized funding for three pilot Centers of Excellence projects. Then in 2005, the Legislature approved Senate Bill No. 2032 expanding the concept into the Centers of Excellence in Economic Development program. The legislation called for a \$50-million state investment over multiple biennia, to be leveraged on a 2-to-1 basis with private sector and federal funds. The Legislature approved \$20 million for the initiative in the 2005-07 biennium, which launched 11 different Centers throughout the state. These Centers are located in Fargo (3), Grand Forks (3), Bismarck, Valley City, Devils Lake, Dickinson and Williston (for additional information, see Goettle 20(8)). The 2007 Legislature approved additional funding for the program. As of March 2008, two Centers were fully operational, nine Centers were in the early stages of their planned activities and three Centers were under development. In addition, two Centers had been authorized for new funding but had not yet received funds.

The purpose of this report is to estimate the economic impacts of the Centers of Excellence program for 2007. The analysis is based on payroll and associated costs reported by each Center in their 2007 annual reports, as well as start-up costs reported by the Centers.

#### Methods

The initial task in any impact assessment is estimating the direct impacts (or "first-round effects") of the activity being studied. In this study, information on payroll and start-up costs, as well as direct employment, were drawn from the 2007 report from each Center. Other expenditures by the Centers and/or their private sector partners were assumed to bear the same relationship to payrolls as has been found in past studies of the economic impact of research & development activities (Leistritz and Coon 2008), exported services (Coon and Leistritz 20(1)) and manufacturing (Coon and Leistritz 19(7)). The North Dakota Input-Output Model was used to estimate the secondary economic impacts based on these data.

The North Dakota Input-Output Model consists of interdependence coefficients or multipliers that measure the level of business activity generated in each economic sector from an additional dollar of expenditures in a given sector. (A sector is a group of similar economic units, e.g., the firms engaged in retail trade make up the retail trade sector.) For a complete description of the input-output model, see Coon and Leistritz (1989). The model estimates the changes in gross business volume (gross receipts) for all sectors of the area economy resulting from the direct expenditures associated with the Centers of Excellence program. The increased gross business volumes are used to estimate secondary employment and tax revenues based on historic relationships. The procedures used in the analysis are parallel to those used in estimating the impact of other facilities and activities (Leistritz and Coon 2008; Bangsund and Leistritz 2004 & 2007, Iiodur et al. 2(06)). Empirical testing has confirmed the model's accuracy in estimating changes in levels of economic activity in North Dakota. Over the period 1958-2006, estimates of statewide personal income derived from the model averaged within 4 percent of comparable values reported by the U.S. Department of Commerce (Leistritz et al. 1990, Coon and Leistritz 2008).

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<sup>1</sup>The authors are respectively professor and research scientists in the Department of Agribusiness and Applied Economics, North Dakota State University, Fargo.

## Results

The economic impact of the Centers of Excellence program was analyzed in four segments. The first of these examined impacts associated with the R&D, training and educational activities of the Centers. Two Centers had developed important private sector partners, one in exported services and the other in manufacturing. These activities were analyzed separately. Finally, several Centers had major one-time start-up expenditures in 2007, which formed the basis for the fourth component of the analysis.

Table 1 summarizes economic impacts of the Centers' R&D and related activities. The 2007 estimated direct expenditures by the 12 Centers that reported some level of activity totaled \$27.3 million. The Centers' direct expenditures illustrate the high level of leveraging associated with the program. As of March 2008, the total state investment of \$23 million had been leveraged with nearly \$100 million in matching funds from private and other sources (Goettle 2(08)). The Centers also reported 296.25 jobs, including Center and partner employees. The Centers' direct expenditures resulted in estimated secondary effects of \$55.2 million for a total impact of \$82.5 million. Estimated secondary employment was 408 jobs, for a total employment effect of almost 704.25.

The estimated economic impacts of the Center partner engaged in exported services are summarized in Table 2. The partner firm had direct employment of 102 and annual direct expenditures to North Dakota entities of \$7.9 million. These resulted in secondary economic impacts of almost \$16.2 million, for a total economic impact of \$24.1 million. The total employment impact was estimated at 220.

A second Center partner was engaged in manufacturing, and the economic impacts of its operations are summarized in Table 3. The firm had 95 employees and 2007 expenditures to North Dakota entities of \$4.9 million. These resulted in an estimated secondary impact of \$10.9 million, for a total impact of \$15.8 million. Secondary employment was estimated at 76 jobs, for a total employment effect of 171.

The economic impacts associated with the Centers' one-time start-up expenditures in 2007 are summarized in Table 4. The one-time expenditures totaled \$18.8 million, of which \$17.7 million were to the construction sector. Four Centers had multi-million dollar construction expenditures in 2007. Total economic impacts associated with these expenditures were \$46.7 million. This level of economic activity would support about 169 jobs.

The economic impacts associated with the Centers of Excellence program in 2007 are summarized in Table 5. The direct economic impacts of Center and partner activities total \$59 million. The total economic impact (contribution) was \$169 million. Direct employment by Centers and partners totaled 493.25 and total employment effects totaled 1,264.25. These levels of increased economic activity also generate additional state tax collections. Sales and use tax collections are estimated to increase by \$1.8 million while personal income tax collections increase by \$0.9 million.

## Discussion

The Centers of Excellence program is North Dakota's major initiative to participate in technology and information-based economic development. Although the program is still in its early stages and most Centers are in early stages of development, the economic effects of the program to date are encouraging. With a direct economic impact of \$59 million and total impact of \$169 million in 2007, the program's contribution to the North Dakota economy is already substantial. Further, it is noteworthy that the two operational Centers (UND Center for Innovation and NDSU Technology Incubator) are already making impressive contributions. In 2007, these two Centers combined for 233 direct jobs (Center staff plus tenants) and a payroll of \$ 10.7 million. As the other Centers become fully established and partner facilities are developed, the program's economic contribution can be expected to increase considerably.

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**TABLE 1****Direct, Secondary and Total Economic Impacts of North Dakota Centers of Excellence R & D Activities, 2007**

Sector	Expenditures/Receipts		Total
	Direct	Secondary	
	----- \$000 -----		
Communications & Public Utilities	730	2,796	3,526
Retail Trade	4,673	17,203	21,876
Finance, Insurance & Real Estate	5,550	3,815	9,365
Business & Personal Services	876	1,509	2,385
Professional & Social Services	876	2,188	3,064
Households	14,604	18,744	33,348
Other <sup>1</sup>	0	8,961	8,961
<b>Total</b>	<b>27,309</b>	<b>55,216</b>	<b>82,525</b>
Employment	296.25	408	704.25

<sup>1</sup>Includes agriculture, mining, construction, transportation, manufacturing and government.

**TABLE 2****Direct, Secondary and Total Economic Impacts of North Dakota Centers of Excellence Partner Activities, Exported Services, 2007**

Sector	Expenditures/Receipts		Total
	Direct	Secondary	
	----- \$000 -----		
Transportation	132	81	213
Communications & Public Utilities	264	815	1,079
Ag. Processing & Manufacturing	44	399	443
Retail Trade	1,144	5,052	6,196
Finance, Insurance & Real Estate	1,584	1,124	2,708
Business & Personal Services	264	445	709
Professional & Social Services	88	638	726
Households	4,400	5,425	9,825
Other <sup>1</sup>	0	2,213	2,213
<b>Total</b>	<b>7,920</b>	<b>16,192</b>	<b>24,112</b>
Employment	102	118	220

<sup>1</sup>Includes agriculture, mining, construction and government.

**TABLE 3****Direct, Secondary and Total Economic Impacts of North Dakota Centers of Excellence Partner Activities, Manufacturing, 2007**

Sector	Expenditures/Receipts		Total
	Direct	Secondary	
	----- \$000 -----		
Construction	270	361	631
Transportation	67	52	119
Communications & Public Utilities	112	485	597
Ag. Processing & Manufacturing	607	649	1,256
Retail Trade	517	3,100	3,617
Finance, Insurance & Real Estate	1,011	683	1,694
Business & Personal Services	45	273	318
Professional & Social Services	22	374	396
Households	2,247	3,503	5,750
Other <sup>1</sup>	0	1,410	1,410
<b>Total</b>	<b>4,898</b>	<b>10,890</b>	<b>15,788</b>
Employment	95	76	171

<sup>1</sup>Includes agriculture, mining and government.

**TABLE 4****Direct, Secondary and Total Economic Impacts of North Dakota Centers of Excellence Partner Activities, Exported Services, 2007**

Sector	Expenditures/Receipts		Total
	Direct	Secondary	
	----- \$000 -----		
Construction	17,747	978	18,725
Communications & Public Utilities	117	1,185	1,302
Retail Trade	132	7,998	8,130
Finance, Insurance & Real Estate	26	1,649	1,675
Business & Personal Services	44	568	612
Professional & Social Services	66	807	873
Households	744	11,495	12,239
Other <sup>1</sup>	0	3,131	3,131
<b>Total</b>	<b>18,876</b>	<b>27,811</b>	<b>46,687</b>
Employment	0	169	169

<sup>1</sup>Includes agriculture, mining, transportation, manufacturing and government.

## TABLE 5

### Summary of Economic Impacts of the Centers of Excellence Program, 2007

	R&D Activities	Partner Exported Services	Partner Manufacturing	One-Time Start-Up	Total
Direct Impact (\$000)	27,309	7,920	4,898	18,876	59,003
Total Impact (\$000)	82,525	24,112	15,788	46,687	169,112
Direct Employment (FTE Jobs)	296.25	102	95	0	493.25
Total Employment (FTE Jobs)	704.25	220	171	169	1,264.25
Sales & Use Taxes (\$000)	1,013	287	167	376	1,843
Personal Income Taxes (\$000)	500	147	86	184	917







**John Hoeven, Governor**  
**Shane Goettle, Commerce Commissioner**  
**William Goetz, Chancellor of ND University System**

**Centers of Excellence Commission Members:**

Mark Nisbet, Chairman  
Tim Hennessy, Vice Chairman  
Kathy Gaddie  
Sue Andrews  
Pam Kostelecky  
Duaine Espegard

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