IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FY10 Board of Regents, State of Iowa, Annual
Economic Development and Technology
Transfer Report

PRESENTED BY SHARRON QUISENBERRY, VICE
PRESIDENT FOR RESEARCH AND ECONOMIC
DEVELOPMENT

September 20, 2010
1. Please briefly describe the relationship of your institution’s economic development activities to the enhancement of economic growth in the state. The description should cover, but not necessarily be limited to the following:
   A. the relationship between institutional activities and creation of jobs and wealth in Iowa
   B. Institutional activities and services which indirectly promote economic development, such as training provided to staff of local economic development agencies

1A. Enhancement of Economic Growth through Job Creation and Retention, Investments, Sales, and Cost Savings

Iowa State University engages in several activities that have direct impact on both the creation as well as the retention of jobs in Iowa. The ISU Research Park is a technology community that encourages commercialization of university research. Likewise, the Innovations Development Facility, part of the Plant Sciences Institute, incubates new companies. In addition, the IPRT (Institute for Physical Research and Technology) Company Assistance Program, ISU Extension’s Center for Industrial Research and Service (CIRAS), the Small Business Development Center (SBDC) and the ISU Pappajohn Center for Entrepreneurship interact with companies across Iowa to solve production and management problems. These interactions lead to the resolution of problems related to product development and business management. As a consequence of the improved production resulting from these interactions, businesses have been able to retain and often expand their work force. Some examples of the direct impact that these ISU units have had this past year are as follows:

- The ISU Research Park continues to be successful in initiating as well as nurturing numerous new businesses. Ten new companies and affiliates have joined the Park in FY10, bringing the historical total to 201 companies, research centers, and affiliates. Currently, there are 69 companies, research centers, and affiliates located in the Park, employing 894 people.

- One new faculty-affiliated start-up company has joined the Innovations Development Facility, which is an on-campus business incubator in the Roy J. Carver Co-Laboratory, under direction of the Plant Sciences Institute. A total of 15 companies have used this business incubator space since the facility opened in September 2003.

- A summary of project evaluation data clearly shows that Iowa companies with technical problems and research and development needs continue to find important technical help through the services of IPRT Company Assistance. Companies report positive impacts affecting their sales, investments, and operating costs despite the economic recession of 2009-2010. Of the IPRT clients responding to the survey, the estimated annual impact over the last 5 years is $11.6 million per year. Companies also estimated over thirty jobs were created or retained each year from 2005-2009, with 14 jobs retained or created from projects surveyed in the past year when many employers were cutting jobs.
The satisfaction rating given by clients during this five-year period is 4.7 (1-5 scale, with “1” being “is not satisfied” and “5” being “very satisfied).

- ISU proprietary biodiesel catalyst technologies (developed by [recently deceased] Victor S.-Y. Lin, who had been director of IPRT’s Center for Catalysis and a professor of chemistry at Iowa State University) have been successfully transferred to an Iowa-based startup company, Catilin, Inc. These unique recyclable solid catalysts have enabled Catilin to attract $6.7 million in venture capital. The company, founded in 2007, now employs almost 30 full-time staff members. Catilin and IPRT’s Center for Catalysis received a grant in FY10 and are embarking on a $5.3 million study of biodiesel production from algae.

- Visualization software for medical applications (developed by Eliot Winer, associate director of IPRT’s Virtual Reality Applications Center (VRAC) and professor of mechanical engineering at Iowa State University, James Oliver, VRAC director and Dr. Thom Lobe, a pediatric surgeon based at Blank Children’s Hospital in Des Moines) have been transferred to an Iowa-based company. Visual Medical Solutions, founded in 2007, is offering BodyViz, software that creates 3D MRI, CT scan visualizations, unlocking medical imaging for the practicing surgeon, diagnostics and treatment. The company is located in the Iowa State University Research Park and employs four people.

- Biomass conversion technologies (developed by Robert Brown, director of IPRT’s Center for Sustainable Environmental Technologies, Iowa Farm Bureau director of Iowa State's Bioeconomy Institute, and professor of mechanical engineering, along with three graduate students) have become the basis for a new company. Avello Bioenergy Inc. is commercializing profitable feedstocks for asphalt, fuels, chemicals and soil amendment markets through low-cost thermal conversion of biomass. The company was formed in 2009 by Brown and his students, Jared Brown, Cody Ellens and Anthony Pollard, now all graduates of Iowa State. The company has secured seed funding from an Iowa venture capital firm and is located in Ames.

- Extension’s Center for Industrial Research and Service (CIRAS) has a mission to improve the quality of life in Iowa by enhancing the performance of business and industry through research, education, and technical assistance. Cumulatively, over the past five years, CIRAS and its partners have reported impact from companies totaling more than one billion dollars (new investments $315 million, costs saved or avoided $73 million, sales gained or retained $692 million) with 13,173 jobs added or retained as a result of the technical assistance, education, or research they received.

- In FY10, businesses from 97 counties in the state received assistance on projects or attended educational workshops with CIRAS staff or partners; 1,161 companies reported $46 million in new investments, $20 million in costs saved or avoided, and $261 million in sales gained or retained. Company executives stated that 5,254 jobs were added or retained as a result of the research, technical assistance, or education they received from CIRAS and its partners.

- As part of the CIRAS response to the floods and tornadoes of 2008, a business continuity planning program was developed for Iowa manufacturers. During the
business continuity planning process, CIRAS worked with companies to identify risks and to develop and implement mitigation plans to ensure critical business operations recover in the minimum amount of time after a disruption. Since the flood, the training has been provided to 17 Iowa companies. Beyond developing the plan for a disaster, companies participating have stated they have had many improvements in day-to-day operations resulting from the strategic planning that occurred during the plan preparation. Reported impacts have exceeded $250,000 per company.

More than 700 participants were trained in FY10 by attending conferences and workshops offered through a partnership of CIRAS; Civil, Construction, and Environmental Engineering; Electrical and Computer Engineering; Alliant Energy; CIPCO; MidAmerican Energy; the Iowa Association of Municipal Utilities; the Baker Group; and the Iowa Energy Center. Energy efficiency workshops, held across Iowa, provided education on compressed air systems, pumps, and motors. Energy short courses educated participants on the production, transmission, and distribution of electricity. Engineers, geologists, technicians, and safety personnel attended structural engineering, transportation, and environmental and water resources design conferences. Attendees were able to obtain professional development hours towards retention of their Iowa engineering licenses.

The recent economic downturn has caused a reduction in sales for many Iowa companies. As a result, there has been a growth in the number of companies seeking assistance from CIRAS to better understand how they might increase their sales by providing products or services to Federal, state, or local governments. CIRAS staff provided counseling to more than 770 companies. These companies reported over $189 million in government contract impact due in part to the assistance they received. The Defense Logistics Agency, which funds CIRAS to provide assistance to Iowa companies, indicated this impact helped create or retain over 3,000 jobs.

During FY10, the Small Business Development Center (SBDC) provided business assistance to companies, involving 2,782 clients and 14,306 counseling hours. They also conducted 313 training workshops in which 3,827 individuals participated.

The ISU SBDC, along with the ISU Pappajohn Center for Entrepreneurship, provided 2,953 hours of counseling assistance to start-up and existing companies; served 153 clients with one-on-one counseling; educated 353 attendees through workshops; provided advice to several hundred clients via telephone and email; and advised 41 technology companies in the areas of licensing, equity based financing, market entry, and numerous operational areas.

Every year the SBDC commissions Professor James J. Chrisman to review the economic impact of the SBDC’s clients who receive five or more hours of counseling from the SBDC, which account for only 20% of the total SBDC client base. In a report on this client segment published by Professor Chrisman, Economic Impact of Small Business Development Centers (SBDC’s), it was shown that for every $1.00 in state and federal funding in FY08, the total tax dollars returned to the State of Iowa and the federal government by SBDC clients
in 2009 was $1.25. Among these clients there were 248 jobs retained, 430 jobs created, and $16,330,310 in new sales. The SBDC helped these clients raise over $34 million in financing for their businesses.

- Technologies originating at ISU and licensed to Iowa companies have resulted in over $58 million in sales by those companies in calendar year 2009. Total sales of ISURF-licensed technologies were $514 million, not including germplasm.

- The Office of Intellectual Property and Technology Transfer began supporting SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer) outreach efforts in FY06. Since then, SBIR and STTR funding in Iowa has rebounded. In FY10, eighteen different Iowa companies won twenty-four new or continuing SBIR and STTR awards worth $7.2 million. This is the fifth consecutive year that funding has risen and the first time it has surpassed $7 million. An emphasis has been placed on outreach and training activities. This includes a monthly newsletter and workshops presented by Federal program managers. In addition, comprehensive proposal preparation support has contributed to an increasing number of companies applying for funding. Twenty-three Iowa companies were assisted in the preparation of twenty-five proposals during FY10, including five Iowa State faculty or staff-related companies. The funded projects reflect Iowa’s strengths in biotechnology, information systems, materials development and agriculture. Over $3.9 million in support was awarded by NIH for diverse projects that range from the development of improved influenza vaccines to new cancer drugs to new animal models for human diseases. An additional $1.8 million was received for Department of Defense projects that include innovative training tools, vaccines for biowarfare agents and software for optimizing the load distribution among soldiers.

- The ISU Grow Iowa Values Fund program has a competitive research component that pairs ISU faculty members with Iowa industries to create economic benefit for the companies. A survey of nine companies (surveyed one year after project completion) that participated in projects that were completed in June 2007 documented 71 jobs created or retained and a $9.1M sales impact due to the research projects conducted in partnership between ISU and the companies. Surveys for the round of projects completed in June 2009 are occurring this winter.

1B. Training Opportunities for Staff of Local Economic Development Agencies and Other Activities that Indirectly Promote Economic Development

- The College of Engineering and ISU Extension’s Center for Industrial Research and Service (CIRAS) in partnership with the Iowa Alliance for Wind Innovation and Novel Development (IAWIND) and the Iowa Wind Energy Association (IWEA) held a joint wind conference to facilitate dialog and planning to grow the wind industry in Iowa. Industrial experts and academic researchers delivered educational workshops on new trends in wind turbine design, energy storage, and the integration of wind power into existing distribution systems. Over 260 attendees from academia, government, and industry participated in the conference.
In 2010, CIRAS developed a training curriculum for Iowa businesses to provide education on a new federal regulation requiring compliance with the Department of Homeland Security (DHS) E-Verify system. Companies awarded specific Federal government contracts must enroll in the DHS online system to electronically verify the employment authorization of employees working in the United States. Thirteen workshops were held throughout the state of Iowa with over 130 attendees. This training provided companies with the necessary tools to meet the compliance requirement in selling to the Federal government.

The Siouxland Industrial Roundtable, in partnership with the Siouxland Chamber of Commerce and CIRAS, provide opportunities for industry leaders to learn from each other’s experiences, find out what has worked or not worked for others, and how to apply this information to grow their own companies. Nationally recognized speakers provided education in a variety of areas. The latest event focused on the immediate and future economic status of the Siouxland area. Over 100 attendees from Iowa, Nebraska, and South Dakota attended the Roundtables.

2. Please provide the following information for FY10: (If your institution utilizes additional metrics specific to your institution’s specialized areas of research or service, please include them here)

Note: Unless noted, the data provided below are FY10 data.

   a. Number of disclosures of intellectual property: 111
   b. Number of patent applications filed: 26
   a. Number of patents awarded: 29
   b. Number of license and option agreements executed on institutional intellectual property, in total and in Iowa: 97 total, 32 in Iowa
   c. Number of license and option agreements yielding income: 260
   d. Revenue to Iowa companies as a result of licensed technology: $58 million (CY09)
   e. Number of startup companies formed, in total and in Iowa (through licensing activities): 0 total, 0 in Iowa
   f. Number of companies in research parks and incubators: ISU Research Park: 39 private and 17 university-related; Plant Sciences Institute Innovations Development Facility (IDF): 3 (all university-related or affiliated)
   g. Number of new companies in research parks and incubators: ISU Research Park: 9 private and 1 university-related; Plant Sciences Institute IDF: 1 (both university-affiliated)
   h. Number of employees in companies in research parks and incubators: ISU Research Park: 550 private and 202 university-related; Plant Sciences Institute IDF: 6 (all university-related or affiliated)
   i. Royalties and license fee income: $9.4 million
   j. Total sponsored funding received: $388.2 million of which $239.2 million is for research
   k. Corporate sponsored funding received for research and economic development, in total and in Iowa: $21.1 million total, $11 million in Iowa
I. Iowa special appropriations for economic development in the following categories:
   i. Annual state appropriations for ongoing programs (such as research parks, SBDC, IPRT, IDM, Metal Casting Center): $2.5 million—including $894,930 SBDC (includes state-wide programs), $130,010 ISU Research Park & $1,447,588 IPRT
   ii. Grow Iowa Values Fund appropriations: $1,732,500
   iii. Battelle appropriations No new funding in FY10
m. Research expenditures (including state appropriations and external funding) $224.3 million—Note that this is an FY09 number, most recent number available
n. Licenses and options executed per $10 million research expenditures: 3.4 (est.)—Note that this is an FY09 figure, most recent number available
o. Sales of licensed products by Iowa-based companies: See d. above
p. Number of employees for current Research Park tenants and incubator, as well as former tenants that are still in existence in basic form world-wide 2,845
q. Number of interactions ISU had in FY09 with communities and businesses across the State of Iowa: ~6,500 (in all 99 counties)

3. Please describe the ways in which your institution is engaged in the following activities (For example, what is the nature of the outreach and service activities? Which units provide it? What kinds of people and organizations benefit?)
   A. Direct and hands-on technical assistance to businesses and entrepreneurs
   B. Direct economic development assistance to Iowa communities
   C. Economic development services provided by research parks, incubators or similar service units

3A. Direct and Hands-on Technical Assistance to Businesses and Entrepreneurs: ISU System for Innovation

Iowa State University is charged with advancing economic development and technology transfer activities that promote growth and benefit all citizens. While creation of knowledge remains the basic responsibility of a research university, the way we share knowledge determines our success. ISU shares knowledge and expertise with students (learning and teaching), communities (engagement), and business and industry (technology transfer and economic development). ISU ranks as one of the most successful universities nationwide in several categories of technology transfer and economic development. The activities of the colleges, institutes and centers are coordinated through the Research and Economic Development Council that advises the Vice President for Research and Economic Development. The Vice President and this Council continuously communicate with economic development entities within the State such as the Iowa Department of Economic Development, the Iowa Business Council, the Greater Des Moines Partnership and other local and regional agencies.

The Iowa State University “System for Innovation” was developed to focus on the transfer of university technologies into commercial applications in start-up or existing companies. Functions of the ISU System for Innovation include:
• **Business Development & Assistance and Entrepreneurial Activities**: Efforts related to start-up companies, including business assistance services & SBIR/STTR applications.

• **Technical Assistance & Technology Development**: Solving technical problems, assisting in product development and process improvement projects for existing businesses. This includes the current efforts of no-cost technical assistance and cost-sharing projects.

• **Industry Relations**: Facilitation of a multitude of interactions between ISU and its industry partners, including the management of research relationships and interactions with economic development groups, legislative groups, and other third parties.

• **Community Development**: To disseminate and develop programming, facilitating community organizations, fostering community planning, and coordinating with community and regional economic development networks and organizations.

• **Technology Transfer and Licensing**: The transfer of intellectual property (patentable inventions, copyright works and proprietary materials) to business and industry through license agreements.

• **Physical Space**: Physical space for business incubation is available in the ISU Research Park, the Plant Sciences Institute, and the Center for Crops Utilization Research.

• **Research and Instrumentation Facilities**: Iowa State University maintains more than 20 central research facilities that also serve communities and businesses on a fee-for-service basis.

3B. **Direct Economic Development Assistance to Iowa Communities**

• Since 2005, ISU Extension’s Center for Industrial Research and Service (CIRAS) has partnered with the ISU Department of Economics to conduct six regional economic studies throughout Iowa. The studies provide economic developers with an overview of their regional economy and the forces affecting it, assess the regional industrial structure, identify key regional industries, and promote the use of research-based criteria for justifying public economic development spending. The regional studies help to enhance the link between local economic development needs and Iowa State University research, extension, and continuing education professionals. The studies have been funded in part from a grant to CIRAS from the Economic Development Administration.

The sixth study, “Establishing a Baseline for the Siouxland Tri-State Regional Innovation Project: Key Industries and Occupational Characteristics,” was completed in June 2009. Through this study, CIRAS assisted the Siouxland Region (ten counties in three states) in identifying their regional economy by defining the occupational characteristics and key industries in the region. This data assisted the region in the development of a strategic plan driven by a Regional Innovation Grant (RIG). The RIGs are funded by the Employment and Training Administration within the Department of Labor to assist state workforce agencies and local Workforce Investment boards in the development of a comprehensive, integrated, strategic regional plan, with a focus on current or future unanticipated economic events. CIRAS continues to work with the greater
Siouxland region to assist with data driven decision-making in addressing economic development and workforce development issues in the region.

3C. ISU’s Key Units Engaged in Economic Development

Iowa State University, as part of the higher education system in the State, is charged with advancing technology transfer and economic development activities that promote growth and benefit all citizens. The University evolves these goals by contributing to workforce development, creating intellectual property, advancing ideas to the stage of market readiness, supporting creation of new companies, offering assistance to existing companies, and attracting new companies to the State. The University’s economic development/technology transfer support system includes the following units that are coordinated through the Research and Economic Development Council:

- **Pappajohn Center for Entrepreneurship and the Small Business Development Center (SBDC).** These units work with researchers to define the technologists’ role in the company, evaluate markets, assist in the creation of a business plan and help the company develop connections with a network of business resources including consultants, accountants, attorneys, prospective employees and investors. In a typical year, the Pappajohn Center, working with IPRT, the Plant Sciences Institute, ISURF/OIPTT and other research centers, identifies approximately 25 prospective new technologies. These technologies can take six to 26 months to develop sufficiently to justify the formation of businesses. During this time the researcher receives assistance in moving the technology from the researcher’s bench to the marketplace. The Pappajohn Center helps the researcher develop the model for the business and establish the network of resources necessary to implement the plan. These resources can include business assistance, students or capital. The Pappajohn Center/SBDC also continues to provide a referral network and facilitates the recruitment of students including access to internships.

- **Institute for Physical Research and Technology (IPRT).** Through IPRT’s Company Assistance Program, Iowa companies can leverage the expertise of the IPRT research centers and other ISU capabilities in order to solve technical problems, create new products and processes, and increase productivity and quality. IPRT Company Assistance provides help through both its Research and Development cost-sharing program and through short-term, no-cost technical assistance. IPRT assists early-stage technology commercialization and actively collaborates with Iowa companies on technology development projects. IPRT plays an integral role in the process of technology transfer targeted at new business creation. Many successful businesses have emerged from IPRT technologies, including Mechdyne of Marshalltown, BodyViz of Ames and PowerFilm, Inc. of Ames.

The staff members of the Materials Group and the Nondestructive Evaluation Group within Company Assistance provide significant and broad expertise to help Iowa manufacturers address material and inspection issues. These programs offer state of the art knowledge made available to business, and both groups have expanded their capabilities and facilities to keep pace with research.
advances and modern industrial needs. This direction allows them to reach ever more clients and tackle an increasingly wide range of challenges.

IPRT was a major supporter of the Interlock House, Iowa State’s entry into the U.S. Department of Energy’s 2009 Solar Decathlon competition. The entry finished in 12th place in the international competition held at the National Mall in Washington D.C. in October 2009. The team, which consisted of more than 75 students and faculty, designed and built the Interlock House as a free standing solar-powered home that generates more energy than it consumes. The Interlock House was the only entry in the competition that was entirely ADA accessible. More than 14,000 people toured the house while it was in Washington. The Iowa Department of Natural Resources has purchased the house and will use it as an interpretive center at the Honey Creek Resort State Park at Rathbun Lake in southern Iowa.

- **Iowa State Innovation System (ISIS).** Near the time a venture is launched, facilities become an issue. ISIS, ISU’s technology incubator, provides an ideal first home for companies. ISIS offers connections to the University, affordable space with reception services, office equipment (copiers, fax machines, and computers), conference rooms, and other amenities at a very reasonable rate. The Pappajohn Center, described above, provides mentoring to the companies as well as the opportunity for companies to utilize students as interns and researchers. ISIS will generally attract five new companies each year. Companies typically spend one to three years in the Incubator moving from product development to product sales. Once sales are established, companies grow out of the Incubator. Some companies remain within the Research Park and continue to receive development assistance, while others move on to commercial space elsewhere but can still receive business development services from the ISU Pappajohn Center and ISU SBDC. As companies mature, the University provides opportunities for collaboration between researchers at the University and in the companies. Students provide cost-effective labor and are potential employees. The Research Park provides expansion space, often financing the space and improvements.

- **Iowa State University Research Park.** The Iowa State University Research Park is a 230-acre development with over 325,000 square feet of building space and is located south of the Iowa State University campus. The ISU Research Park is more than just land and buildings; it is a technology community that encourages commercialization of University research.

- **Extension’s Center for Industrial Research and Service (CIRAS).** CIRAS provides research, education, and technical assistance to Iowa industry through partnerships with Iowa’s universities and community colleges, government agencies, and business associations. Account managers throughout the state meet with clients to assess needs and provide links to resources that companies can use to increase their competitiveness. Solutions are offered through a combination of direct assistance from center staff, university faculty, partner organizations, and outside consultants.

CIRAS staff has expertise in engineering, biobased products and biorenewables, management practices, government contracting, productivity, growth services,
CIRAS is supported in part by the DoC/NIST Manufacturing Extension Partnership, the DoD/DLA Procurement Technical Assistance Program, the DoC/EDA University Center Program, and the USDA BioPreferred program.

- **ISU Research Foundation (ISURF) and the Office of Intellectual Property and Technology Transfer (OIPTT).** ISURF owns and ISURF and OIPTT jointly manage, market and license the intellectual property for Iowa State University. ISURF/OIPTT works with faculty members in regard to the reporting and protection of innovations, including patenting inventions. It markets the innovations to find commercial partners interested in licensing. It also funds projects within the University that have potential for broadening the intellectual property protection or providing value for its commercial potential. ISURF also provides assistance to Iowa companies, including ISU faculty start-ups with SBIR and STTR applications.

- **Innovations Development Facility (IDF).** This is a business incubator operated by the Plant Sciences Institute to promote the commercialization of plant biotechnology. IDF encourages ISU faculty, staff, and students to commercialize their research in the plant sciences and promotes the development of start-up companies among aspiring entrepreneurs. IDF is housed in the Roy J. Carver Co-Laboratory and consists of six well-equipped laboratory modules. The facility offers an environment to transition research from a university to a business setting. The IDF facility is a productive research location where scientists from academe and industry can work together to advance the mission of the Plant Sciences Institute and to promote economic development in Iowa.

- **ISU Extension to Agriculture and Natural Resources (ANR) provides educational leadership to integrate Iowa’s rich natural resources, productive people, and viable communities with its strong agricultural industry to grow the economic base of Iowa agriculture. The ANR program plans and delivers extension education activities through seven teams of faculty, field specialists, and staff with expertise in crop production and protection, farm business management, horticulture, beef production management, pork production management, dairy production management, and natural resources and stewardship. ISU Extension Value Added Ag Program (VAAP) staff has conducted five major feasibility studies to-date in FY10. As a direct result of the studies, 29 existing jobs were retained and 58 new jobs were created. These feasibility reports assisted the businesses in acquiring nearly $31 million in loans and loan guarantees, resulting in tangible economic development in Iowa.

In response to a USDA initiative and growing interest in local food production, ISU Extension Value Added Ag Program (VAAP) staff delivered nine workshops on high tunnel fruit and vegetable production at six locations across Iowa. Each of the 227 participants received a copy of the Iowa Fruit and Vegetable Production in High Tunnel Manual, which the VAAP staff developed and made
available in English and Spanish. In the first year of a three year project, nearly 70 high tunnels have been constructed in Iowa through a new cost-share program offered by USDA-NRCS. Working closely with the state NRCS staff, nearly all of the grower participants have accessed ISU-VAAP resources designed to help improve their profitability in development of a local food market.

- **ISU Extension to Communities** economists spent several months searching for data that would yield the clearest picture of the state of affordable housing in Iowa. The study examined effects of recent trends and occurrences such as the 2008 floods, the economic recession and the local impact of the national foreclosure crisis. As part of this project, ISU Extension worked with IDED staff and stakeholders to draft a strategic plan and solicit public comment on the anticipated use of federal housing funds in the next five years. The State of Iowa and all cities with populations more than 50,000 are required to submit a consolidated plan and strategy to Housing and Urban Development (HUD) every five years in order to receive Community Development Block Grant (CDBG), HOME Investment Partnership Program, Emergency Shelter Grants (ESG) and Housing Opportunities for Persons with AIDS (HOPWA) funds.

In 2004, Le Claire, Iowa was accepted into the Partnering Landscape and Community Enhancement (PLaCE) program offered through ISU Extension and the ISU College of Design’s Institute for Design Research and Outreach (IDRO). The community was paired with a community planning studio that developed a comprehensive plan that addressed growth, transportation, river and recreation, downtown revitalization and tourism. Six years later, the city just completed phase one of a multimillion-dollar streetscape enhancement. Phase one of the plan encompasses a seven-block area along U.S. 67, which runs parallel to the Mississippi River. The levee was developed first. Then, based on the ISU plan, the city redesigned the streetscape. To date, the city has invested nearly $5 million in the project. The second phase of the plan, which is currently on hold because of the economy, will be a continuation of the streetscaping completed in phase one.

In 2009, the Turkey River corridor, including Elkader, Elgin and Clermont, participated in the Community Visioning Program as part of a long-term disaster recovery effort, and Elkader collaborated with the ISU landscape architecture community design studio. In 2010, the Turkey River corridor became an Iowa Great Place.

- **ISU Extension to Families**’ Horizons program provides programming and leadership to help communities take charge, build stronger leaders to address poverty, economic decline and the exodus of young people. The program is funded by a grant from the Northwest Area Foundation. Thirty-six Iowa communities are now graduates of the 18-month Horizons program. Eight hundred thirty six community members participated in face-to-face public meetings in fourteen communities during the Visioning Phase of Horizons III, leading to development of their individual community plan to reduce and address poverty. Another 2,039 shared their poverty reduction ideas in a community survey. Communities implemented poverty reduction efforts like expanding child care, providing food including weekly week-end backpacks to children in need, improving housing, youth mentoring and tutoring, establishing or expanding food
pantries and Farmer’s Markets. Twenty-eight Horizons communities learned entrepreneurial skills, grant writing, how to grow and expand volunteer base, marketing, housing, public policy, forming nonprofits, among other topics during the two state-wide Expanding Horizons workshops.

The Earned Income Tax Credit (EITC) augments the wages of low-income workers and, in turn, this flow of income makes a substantial economic impact in local communities. EITC recipients circulate their refunds through the local economy, creating a ripple effect many times the size of the original refund. This money strengthens neighborhoods, assists small businesses, and spurs local economic development. ISU Extension worked with community partners to recruit and train 70 volunteers to provide free tax preparation services to low-income families through the Volunteer Income Tax Assistance (VITA) program. In 2010, VITA volunteers working at 33 VITA sites helped 1,600 low-income Iowans complete income tax returns. 615 of the filers qualified for the Earned Income Tax Credit (EITC) received $685,845 in the 41 counties that participated in the Extension-community partnerships to expand VITA programs to rural Iowa.

- The Office of the Vice President for Research and Economic Development (OVPR/ED) works closely with all of the above units, including the Office of the Vice President for Extension and Outreach, in promoting the University’s mission related to technology transfer and economic development.
  - The Research and Economic Development Council (chaired by the VPR/ED) coordinates ISU research, technology transfer and economic development activities. Members meet monthly to discuss problems, update each other on activities, assess the state and national environment for technology transfer, and propose policy and procedures to encourage technology transfer and economic development activities at ISU. This council, formed in 1993, is comprised of representatives from all units on campus that have a primary role in economic development and technology transfer as well as representatives from each of the seven colleges.
  - The new comprehensive management strategy for key industrial partners is continuing and beginning to show results. This effort is co-led by the Director of Industry Relations and the Corporate and Foundations Relations group in the ISU Foundation. This is a collaborative effort that involves the Associate Deans for Research in the colleges, CIRAS, IPRT, ISURP, and key research faculty.

The above units are the key units that focus attention on economic development and technology transfer at ISU; however, significant additional related activity also occurs across campus in individual academic departments, centers and institutes, and colleges.
4. Please briefly describe two or three examples of major economic development collaborative projects with such other entities as Regent universities, Iowa community colleges, the Iowa Department of Economic Development, Iowa Workforce Development, or other state agencies.

**Major Economic Development Collaborative Projects**

**NSF EPSCoR.** ISU is collaborating with UNI and the U of I on an NSF EPSCoR proposal that is being submitted in October 2010. If funded and successful, this would develop a statewide energy plan for the State of Iowa, covering two renewable energy platforms—wind and bioenergy and a third platform dealing with energy efficiency. The ultimate outcome would be an energy plan leading to energy efficiency and sustainability for the State. Other partners include the Iowa Office of Energy Independence, the Iowa Energy Center, community colleges and other four-year institutions in Iowa, and industry.

**Grow Iowa Values Fund.** This legislation is providing the universities and private colleges financial resources to expand technology transfer and commercialization efforts. We are in the sixth year of GIVF funding, in addition to providing core support for infrastructure in the Research Park, Pappajohn Center and the VPR/ED office. Each year projects are funded that pair ISU researchers and Iowa companies. More information appears later in this report.

**Battelle Initiative.** ISU, the University of Iowa, and the University of Northern Iowa have worked closely with the Iowa Department of Economic Development, the Board of Regents, State of Iowa; legislators, and business leaders through the Biosciences Alliance of Iowa organization to implement the Battelle initiative. Proposed projects that focus on the biosciences, information technology and advanced manufacturing have been completed. More information appears later in this report.

**State-wide committees** – Many people from ISU serve on committees that promote economic development programs such as the Biosciences Alliance of Iowa, the Iowa Power Fund, the Iowa Advanced Manufacturing Council, Professional Developers of Iowa, the Iowa Business Council, the Iowa Innovation Council, the Iowa Alliance for Wind Innovation and Novel Development (IAWIND), Innovate Iowa!, etc.

5. Please provide the following information about Grow Iowa Values Fund projects for FY 2009:
   A. Identify and briefly describe each project or initiative which received GIVF funding in FY 2009 including information on outcomes or progress made
   B. Identify metrics which were used to measure outcomes for each project and report progress on each metric for FY 2009
   C. Provide a description of the sources of the matching institutional dollars for each GIVF-funded project

The ISU Grow Iowa Values Fund (GIVF) program has a competitive research component that pairs ISU faculty members with Iowa industries to create economic benefit for the companies. See Appendix 1 and Appendix 2 for complete report.
6. Please provide the following information about Battelle-funded projects for FY 2009:
   A. Identify and briefly describe each project or initiative which received Battelle funding in FY 2009 including information on outcomes or progress made
   B. Identify metrics which were used to measure outcomes for each project and report progress on each metric for FY 2009

- Appendix 3 and Appendix 4 provide a detailed report on Battelle funding awarded to ISU.

7. Optional: If desired, please include observations regarding:
   A. Availability of startup and venture capital for technology entrepreneurs
   B. Suggestions for new programs or activities that could further enhance the impact of university technology transfer and service on creation of jobs and wealth in Iowa.

7A. Iowa continues to suffer from a lack of investment capital for start up and rapidly growing technology/innovation based firms.

- The Values Funds to the universities have provided a valuable source of funding for proof of concept/early stage development funding for the innovations that will become the next generation of businesses.

- There has been an increase in the number of Angel/Seed funds throughout the state. Available capital and experience varies widely and there is little coordination between the funds. The seed funds have typically brought more individual investors into play.

- The funding provided by Wellmark through the Pappajohn Center's has been a very valuable tool for early stage investment.

- There are very few true venture capital firms located in the state of Iowa actively investing funds at this point in time. Iowa continues to suffer from a lack of investment capital for start up and rapidly growing technology/innovation based firms.

- Each fund has a particular focus, the investment profile further limiting choices and resulting in very little competition.

- Most venture firms invest with other venture firms, one as lead with the others in secondary positions to spread risk and assure the ability to continue to fund the needs of the company--this is a major problem in Iowa.

- Firms must look outside the state for significant investments of $5 million plus.
Really good businesses with really good management teams will attract money; a major problem is the development of an experienced/skilled management team.

Due to the limited amount of venture capital in Iowa, the College of Engineering has started a Venture Fund for Interdisciplinary Research Centers of Excellence with college funds. The goal is to create new interdisciplinary research centers or institutes at ISU with transformational impact on the College, the State of Iowa, and the nation. This new effort is being marketed to alumni and others in an attempt to grow and sustain the initiative.

Microenterprise--businesses with less than 5 employees--account for 86 percent of business firms in Iowa, according to the Association for Enterprise Opportunity. A 2007 survey conducted by the Iowa Bankers Association in collaboration with the Community Vitality Center and Leopold Center identified a gap in capital for small entrepreneurial firms seeking less than $50,000 in Capital. In 2008, the Community Vitality Center (CVC)--which is administered by ISU Extension--received part of a $1 million grant by Northwest Area Foundation and the Greater Des Moines Community Foundation to implement a business plan for organizing a statewide tax exempt nonprofit microloan intermediary as part of a 3-year Iowa Microenterprise Assistance Project (IMAP). The SBA has also approved a $750,000 revolving microloan fund for the new entity, called the "Iowa Foundation for Microenterprise and Community Vitality." In addition, $475,000 was appropriated for IDED to implement a Community Microenterprise Development Grant program and statewide microenterprise advisory committee to encourage collaboration and coordinate statewide efforts.

During its 2010 session, the legislature created the Save Our Small Business loan program. This $5 million dollar fund is available to existing and startup businesses for certain qualifying uses. The program sunsets on March 31, 2011. In order to access the fund, prospective borrowers must start the application process with the SBDC, where the application is reviewed by SBDC counselors for eligibility and repayment ability. The Iowa Foundation for Microenterprise and Community Vitality acts as the credit facility for the program under an operating agreement with the Department of Economic Development.

7B. Restoration of funds for economic development and technology transfer activities due to budget cuts in the past several years would greatly enhance the University’s efforts in this area. The following is a summary of what benefits would occur if funds were restored in the units affected by budget cuts.

**Small Business Development Centers.** The legislature cut a total of $16,373 from the SBDC budget for FY09 and another $99,436 for FY10. In FY10 the state appropriation after the 10% reduction was $894,930. In FY11, the legislature appropriated an additional $100,000 restricted solely to business counseling and for no other purpose. The FY11 state appropriation is $994,929, down from a high of $1,211,869 in FY01.

In the study by Professor Chrisman referenced above, for every Iowa tax dollar spent on the Small Business Development Center program, over $7.00 is
generated in increased tax collections the following year from SBDC counseling services alone. The majority of any restored and new funds would be directed toward client counseling, resulting in a substantial increase in tax revenues over tax expenditures. Conversely, a reduction in funding could well result in an adverse impact on the state treasury of up to seven times the amount of the reduction. If sufficient new funding was obtained, the SBDC would consider establishing a second service center in the Des Moines metro area, which is an underserved market for the SBDC.

A concurrent increase in federal funding remedied the reduction in state funds for FY09, leaving the net program budget relatively equal to the preceding year. Additional funding from a special congressional appropriation for Midwest disaster relief – the use of which is strictly limited to disaster recovery – permits the SBDC to meet most of the demands from its client base for continued recovery efforts related to the flooding that occurred in 2008.

Any future decreases in funding risk the ability of the program to retain experienced talent and to deliver the services needed by one of the largest component’s of Iowa’s economy, namely small business.

- **Iowa State University Research Park.** The restoration of approximately $230,000 in funding to the Iowa State University Research Park would provide direct benefit to Iowa State University efforts to establish and support new technology ventures. New funds would be utilized to support the costs of providing incubator space and the support services required by new and early stage companies. The additional funds will increase the capacity for business incubation resulting in more new companies created and higher quality support for the young companies.

- **Institute for Physical Research and Technology (IPRT).** The IPRT economic development programs suffered losses of over $161,000 in 2010 and $265,000 in 2009. These losses follow $2,500,000 in budget cuts in 2003, which were never restored. Ironically, these cuts came at times when the need for IPRT’s expertise by Iowa industries was rapidly growing. Although much of the program has survived the cuts, it now serves only a fraction of the Iowa companies it once served and the current personnel are overextended. However, companies seeking help outside the core competencies of the IPRT Company Assistance staff cannot be assisted. In the past these potential clients were guided to working with faculty members via subsidized projects. Because of the budget cuts, IPRT has restricted the technical assistance it provides to Iowa companies to those services that fall within the core competencies of IPRT staff rather than pursuing these collaborative, cross-disciplinary projects. Also, fewer R&D cost-share projects that can lead to new products are pursued due to the declining funding. Over 75% of the Iowa manufacturers that IPRT serves have less than 100 employees.

The materials assistance unit of the IPRT economic development program provides short-term no cost technical assistance to Iowa manufacturers and is often the first interaction that manufacturers have with the University. Restoration of funding would allow for growth of materials assistance, enhancing
their delivery of services. They seek to offer a wider scope of services directly meeting the needs of Iowa manufacturers.

The NDE (nondestructive evaluation) unit of this program functions similarly to the materials group, in that short-term technical assistance is provided to Iowa manufacturers on a no-cost basis. The focus of the NDE Group is to assist companies in areas of inspection and quality control. To that end, the NDE Group serves as an unbiased source of information, offering clients a broad range of expertise in various inspection methodologies. Manufacturers often do not have staff acquainted with these capabilities, so the group in effect complements the engineering capabilities of their clients. The group assists client companies in addressing problem areas, ensuring product development and quality. This assistance requires robust budget support to maintain the needed flexibility to successfully address the wide range of industrial concerns that are presented to it.

The technology commercialization unit has administered cost-sharing, contract research projects and since 1993 has leveraged tax dollars slightly better than 4 to 1. The staff is working with Iowa’s small to medium-sized manufacturers and identifying research and development needs that can be addressed by university teams of faculty scientists and engineers. These small companies have very limited Research and Development dollars and facilities, and now, this unit does not have the funds needed to leverage Iowa companies’ limited resources. These are projects with obvious economic impact—introduction of new products, addressing manufacturing processes, and improving quality—all areas that impact Iowa’s global competitiveness in the manufacturing sector.

A unique feature of the economic development program in IPRT is the active participation of scientists from internationally renowned ISU centers such as the Center for Nondestructive Evaluation, the Virtual Reality Applications Center and the Center for Catalysis. These centers have excellent track records of spinning off new Iowa start-up companies in the areas in which they excel. Restoring the budget cuts to IPRT units would have a rapid positive impact on Iowa’s manufacturing sector. An investment now will result in continuing benefits to Iowa’s companies, important opportunities to retain our brightest students, and new start-up companies based on increased technology transfer from IPRT centers.

- **Center for Industrial Research and Service.** CIRAS has successfully leveraged its state budget to bring in additional federal grants and fees to expand technical assistance and education programs and economic development studies to support Iowa businesses. In FY10, CIRAS generated an additional $2.19 for each $1 of state funds provided. Of the approximately $4 million of additional funding generated, CIRAS distributed more than $900,000 to other business outreach units on campus to help them expand their work with Iowa companies.

CIRAS has lost over $1.4 million of funds (in 2010 $) from their annual budget in the past decade. This includes state appropriations and matching funds provided by the Iowa Department of Economic Development. These funds were used as match on the Department of Commerce/NIST Manufacturing Extension Partnership award and the Department of Defense Procurement Technical
Assistance Program award. This loss of state funds reduces the extent of CIRAS assistance to companies and communities and limits the amount of additional funds that might be brought to Iowa via new business assistance grants.

The loss of annual funding from state appropriations and agencies equates to a reduction of approximately 13 full time staff. This can cause a further reduction of roughly 13 staff due to a loss of federal awards requiring matching funds from the state. Based on an analysis of data provided by Iowa companies, these 26 staff positions might have generated nearly $60 million of impact and more than 700 jobs in Iowa companies — each year.

Using this same data, for every $100,000 of additional state funds that are made available, CIRAS would be able to leverage the funds to bring in an additional $100,000 to Iowa and hire two new business professionals to provide services in the areas of engineering, biobased products and biorenewables, supply chain management, import/export services, government procurement, productivity, growth services, quality systems, or community-business economic development. These two staff would help create nearly 50 jobs and $4,000,000 of new sales, cost savings, and investment impact in Iowa companies.